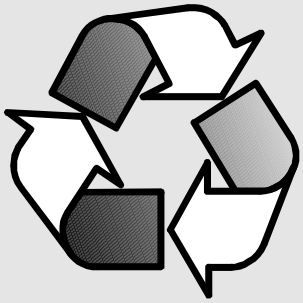
Solid Waste In Washington State



Eleventh Annual Status Report

WASHINGTON STATE
DEPARTMENT OF
ECOLOGY

Solid Waste and Financial Assistance Program
December 2002
Publication #02-07-019

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Solid Waste in Washington State

Eleventh Annual Status Report

Prepared by:

Washington State Department of Ecology
Solid Waste and Financial Assistance Program

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Acronyms

CESQG	Conditionally exempt small quantity generator
CDL	Construction, Demolition and Landclearing
CPG	Coordinated Prevention Grants
EPA	Environmental Protection Agency
ESSB	Engrossed Substitute Senate Bill
EYC	Ecology Youth Corps
GA	Department of General Administration
HDPE	High-density polyethylene
HHW	Household Hazardous Waste
LDPE	Low-density polyethylene
MFS	Minimum Functional Standards
MRW	Moderate Risk Waste
MSW	Municipal Solid Waste
PCS	Petroleum Contaminated Soils
PPG	Public Participation Grants
RCW	Revised Code of Washington
SQG	Small quantity generator
SSB	Substitute Senate Bill
SW&FAP	Solid Waste & Financial Assistance Program
WAC	Washington Administrative Code
WR/R	Waste Reduction/Recycling

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Thanks to all who contributed.

Ellen Caywood
Environmental Planner
Solid Waste & Financial Assistance Program

Executive Summary

Summary of Findings

This annual solid waste report reflects conditions and activities in solid waste in Washington state. Chapter I discusses some emerging issues that the Solid Waste & Financial Assistance Program (SW&FAP) is dealing with in the coming year including the progress toward revising the State Solid Waste Management Plan, "Beyond Waste," completion of revisions to the rule for solid waste facilities, chapter 173-350 WAC*, Solid Waste Handling Standards*, the litter prevention campaign, the move toward sustainability and new measurements for waste diversion.

The remaining chapters of the annual report discuss the solid waste infrastructure in the state, partnering for the environment through grants to local governments and efforts on specific waste streams, litter collection efforts, the 2001 statewide recycling survey results, information on waste disposal and moderate risk waste. Some of the data is for 2001 (recycling and disposal information), while other data is current to late 2002 (litter pickup numbers and facility status). A brief summary of significant information is highlighted below.

❖ **Recycling**

- The 2001 recycling rate increased to 37% after remaining fairly stagnant at 33-35% since 1997. This rate accounts for the "traditional recyclable materials. Increased recycled tonnage and a slight decrease in the disposed amount in municipal solid waste landfills and energy-recovery facilities helped to increase the recycling rate.

- In 2001, the Solid Waste & Financial Assistance Program (SW&FAP) began to include other types of materials in the recycling survey, and calculated a recycling rate parallel to the traditional one. This "alternative" recycling rate includes non-MSW recyclables and non-MSW waste types as inert, construction, demolition, woodwaste and tires. This rate is calculated using the disposed amounts from the traditional sources as well as woodwaste, inert/demolition and limited purpose landfills. For 2001, this "alternative" recycling rate was 41%.

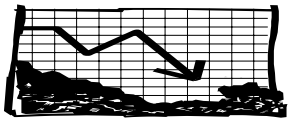
❖ **Litter Collection Efforts**

- For fiscal year 2002, litter collection efforts by Ecology Youth Corps (EYC) picked up a total of 65,543 bags of litter over a total of 4,571 road miles and 1,280 acres. This is the equivalent of 492 tons, or 131,086 cubic feet. Of this total amount of litter 9,641 bags or 72 tons were recycled.

- Other state agency programs were coordinated by SW&FAP. During Fiscal Year 2002, 1,402,819 pounds of litter and illegally dumped materials were collected by Departments of Corrections and Natural Resources.

- The Community Litter Cleanup Program provides funds to local governments through contracts for local litter collection programs. During the fourth cycle (July 2001 – June 2002) local governments partnered with volunteer groups and worked with state and local offender crews and cleaned 21,329 road miles and 2,644 illegal dump sites. A total of 3,810,540 pounds of litter and illegally dumped materials were collected, of which 515,043 pounds were recycled.

❖ **Partnering for the Environment**



- Ecology provided over $17.4 million in Coordinated Prevention Grants to local governments for the 2002/03 cycle. These funds leveraged local matching funds to support over $23 million worth of solid and moderate risk waste projects.

- Ecology continues efforts with the building industry and local governments to promote a sustainable approach to building practices and the effects on the environment and human health.

- Changes continue in the way solid waste is managed. Organics are being composted and land applied for beneficial use. The recycling of industrial by-products for beneficial uses is increasing and the revised *Solid Waste Facility Standards,* chapter 173-350 WAC, will address the new technologies through a Beneficial Use Exemption process.

- Efforts with local governments and other partners is focusing on emerging problem waste streams including electronic waste, tires, old paint, moderate risk waste and persistent bioaccumulative toxins (PBTs) such as mercury and certain pesticides.

- For the past 14 years, schools have been recognized for their waste reduction and recycling efforts, through the "Terry Husseman Outstanding Waste Reduction and Recycling in Public Schools Awards." This program was redesigned in 2002 to focus more on Sustainability. Over the next several years, SW&FAP intends to reward schools that embrace the sustainability principles through the renamed "Terry Husseman Sustainability in Public School Awards Program."

❖ Disposal of Solid Waste

- In 2001, 20 municipal solid waste landfills accepted 4,525,019 tons of waste. This was a slight decrease from 4,659,582 tons in 2000. Two of those landfills closed in 2002.
- The total amount of waste disposed in all categories of landfills and incinerators rose slightly from 6,425,959 tons in 2000 to 6,453,904 tons in 2001
- Currently 15 of Washington's 39 counties have an operating municipal solid waste landfill. Most counties without their own municipal solid waste landfills have long-haul contracts to either Roosevelt Regional Landfill in Klickitat County or one of three landfills in Oregon.
- Four incinerators burned 496,152 tons of waste in 2001, accounting for 10% of the waste disposed in state. Of the four operating incinerators, two burn municipal solid waste, the other two incinerator woodwaste.
- Both the amount of waste imported (172,696 tons) and exported (1,175,953 tons) decreased in 2001, with almost seven times as much waste exported as imported. The imported waste accounts for about 3% of the solid waste disposed and incinerated in Washington.
- The 18 operating municipal solid waste landfills reported in April 2002 a statewide permitted landfill capacity of 179 million tons, or approximately 39 years at the current rate of disposal. The majority of that permitted capacity (86%) is at private landfills, with Roosevelt Regional Landfill in Klickitat County accounting for 75% of the statewide capacity.

❖ Moderate Risk Waste

- In Washington state there are 42 programs that manage moderate risk waste. All 39 counties have some kind of an MRW program.
- In 2001, Washington collected over 15.6 million pounds of household hazardous waste (HHW), over 11.3 million pounds of used oil (UO), and over 1.0 million pounds of conditionally exempt small quantity generator (CESQG) waste, for a total of nearly 27.9 million pounds.

Chapter I Issues Facing Solid Waste

Revising the Standards for Solid Waste

In January 2003, chapter 173-350 WAC, *Solid Waste Handling Standards*, will be adopted. This rule will essentially replace the requirements of chapter 173-304 WAC, *Minimum Functional Standards for Solid Waste Handling (MFS).*

The revised *Solid Waste Handling Standards* include the requirements for most of the solid waste facilities in Washington, excluding municipal solid waste landfills which are regulated under chapter 173-351 WAC, *Criteria for Municipal Solid Waste Landfills*. While there are similarities with the MFS, there have also been some significant changes and modifications:

- **Beneficial Use Exemption** – the legislature, through ESSB 6203, directed Ecology to develop a process to exempt from permit requirements activities that beneficially use solid waste and pose little threat to human health and the environment. Requirements to obtain this permit exemption are contained in WAC 173-350-200.

- **Permit Deferrals** – the legislature, also through ESSB 6203, directed Ecology to explore methods for deferring solid waste permits to other environmental permits. This procedure can be found in WAC 173-350-710.

- **Limited Purpose and Inert Waste Landfills** – these are the only two types of solid waste landfills regulated under chapter 173-350 WAC (municipal solid waste landfills are regulated under chapter 173-351 WAC). There are no longer inert/demolition, woodwaste or problem waste landfill classifications. The two landfill types, limited purpose and inert landfills have similar requirements to the MFS. One significant change is that inert waste landfills cannot accept demolition waste. Inert waste management requires a permit only when being disposed of or used as fill in quantities greater than 250 cubic yards. For limited purpose landfills design requirements are based on the level of risk posed by the type of waste and the site characterization. Financial assurance and ground water monitoring are required for limited purpose landfills.

- **Inert materials** – these are defined in rule and criteria for classifying waste is found in WAC 173-350-990.

- **Ground Water Monitoring Requirements** – each section of the rule indicates whether monitoring is required for that type of facility. Testing methods and parameters and site characterization are clarified in WAC 173-350-500. More flexibility is allowed under the rule. There is also improved coordination with chapter 173-200 WAC, *Ground Water Quality Standards*.

- **Waste Recycling Facilities** – the definition of recycling comes from chapter 70.95 RCW, the *Solid Waste Management Act*. The act of recycling is categorically exempt with the conditions that it complies with local solid waste management plans and that Ecology and the jurisdictional health department are notified of the intent to operate. Storage for the purpose of recycling is subject to appropriate regulation under chapter 173-350 WAC.

- **Compost Facilities** – compost meeting certain quality standards is no longer a solid waste under this rule and is considered "composted material." Testing parameters and frequency are identified in WAC 173-350-220. Some specific exemptions are included in the rule. For permitted facilities, pads are required; storm water and leachate must be controlled. Other requirements can be found in WAC 173-350-220.

- **Moderate Risk Waste** – requirements for household hazardous waste facilities and events and for conditionally exempt small quantity generators are included in WAC 173-350-360. Financial assurance will be required for fixed MRW facilities that store more than five hundred and fifty gallons of MRW on-site.

- **Waste Tire Storage** – requirements for waste tire storage and transportation are included in WAC 173-350-350. Requirements of chapter 173-314, *Waste Tire Carrier and Storage Site Licenses*, are being incorporated in that section. Financial assurance will be required for waste tire storage facilities permitted under this rule.

Additional information and link to Chapter 173-350 WAC, *Solid Waste Handling Standards*, can be found at http://www.ecy.wa.gov/programs/swfa/facilities/350.html.

Diversion as a Measurement Option

Ecology's annual recycling survey has measured a very specific part of the solid waste stream since 1986. It is roughly the part of the waste stream defined as municipal solid waste by the Environmental Protection Agency.[1] However, Ecology has noted very large increases of recovery or beneficial use in "non-MSW" waste streams; most notable are the growing industries in recycling asphalt, concrete, and other construction, demolition, and landclearing debris.

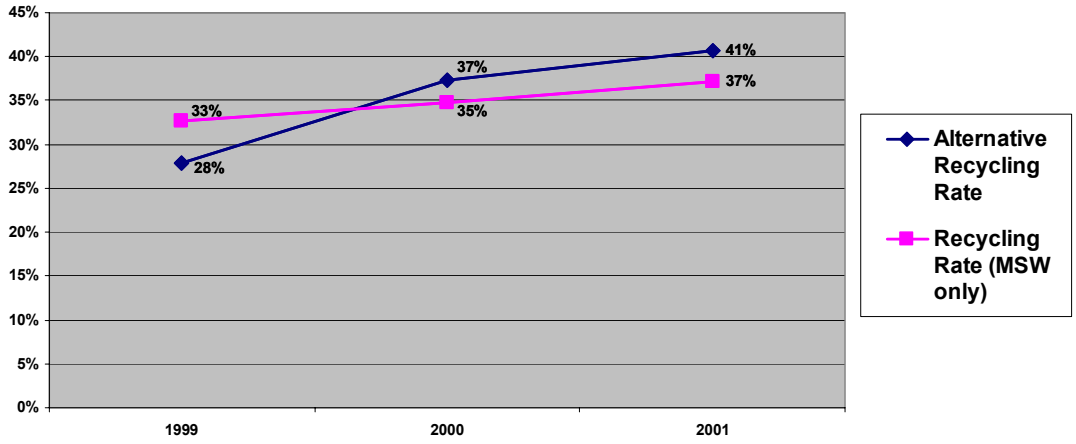
Increasingly, Washington counties and cities have been putting efforts into waste streams outside of the traditional municipal solid waste stream. The best example is the construction and demolition waste stream. Many of these materials, including asphalt, concrete, roofing materials, dimensional lumber, and more, are now being recycled.

[1] The recyclable portion of the waste stream is municipal solid waste as defined by the Environmental Protection Agency in the *Characterization of Municipal Solid Waste in The United States: 1996 Update*. This includes durable goods, nondurable goods, containers and packaging, food wastes, and yard trimmings. It does not include industrial waste, inert debris, asbestos, biosolids, petroleum contaminated soils, or construction, demolition, and landclearing debris disposed of at municipal solid waste landfills and incinerators.

Knowledge of this waste stream is increasing and local governments and businesses are setting up the infrastructure for recycling, reuse, or beneficial use of these items.

The Solid Waste & Financial Assistance Program (SW&FAP) has begun to include other types of materials in the recycling survey, and is calculating a recycling rate parallel to the traditional one, which includes non-MSW recyclables and non-MSW waste types such as inert, construction, demolition, wood, and tires. If these materials are included, Washington shows an "alternative" recycling rate of 41 percent in 2001 (see Figure 1.1 and Chapter V, Figures 5.10 and 5.11).

Figure 1.1
Alternative Recycling Rate Comparison 1999 to 2001
MSW versus All Waste Types[2]



Materials which require minimal or no processing for reuse, resale, or land application (in the case of organic materials) historically have been excluded from the definition of recycling for purposes of determining the recycling rate. The new solid waste rule, chapter 173-350 WAC, *Solid Waste Handling Standards*, once adopted in January 2003, will allow waste generators to apply for relief from solid waste permitting for the use of a waste as a substitute feedstock in a manufacturing or other industrial process or when used as a soil amendment. Until a new definition of recycling is adopted, these activities which provide a beneficial use over landfill disposal or incineration, or perhaps even over recycling, will be counted as "diverted" material and calculated into an alternative recycling rate only.

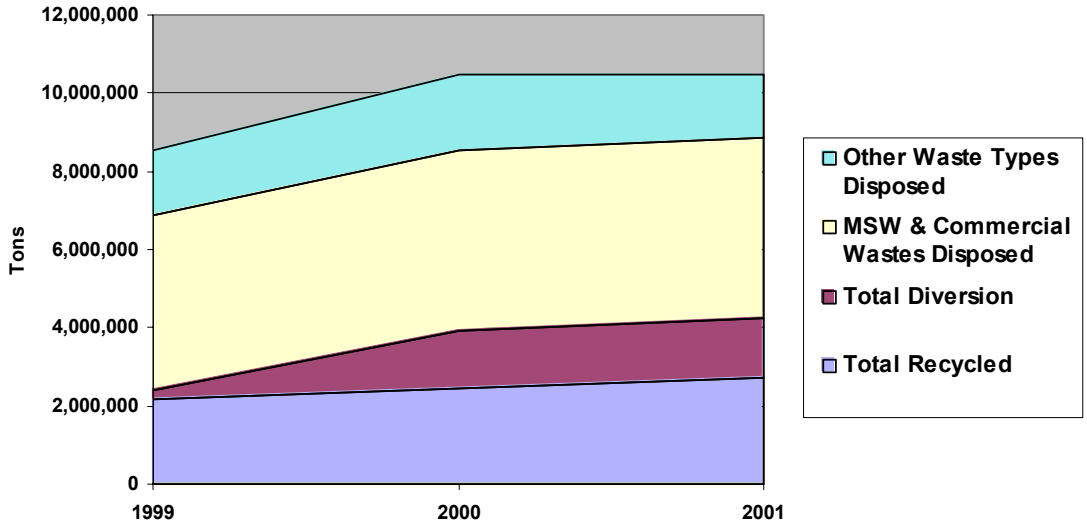
SW&FAP maintains, however, that these wastes are not well characterized and there is no definitive information on the total volume of waste generated, especially in the industrial sector. The reporting requirement for solid waste recyclables does not include these beneficial use activities; therefore, respondents choose on a voluntary basis to report quantities handled. This lack of information makes it difficult to figure a recycling rate for many of these materials because either we do not know the total amount of waste

[2] Includes Municipal, Demolition, Inert, Commercial, Wood, Tires, Medical, and Other Wastes. Excludes Industrial Wastes, Asbestos, Sludges, and Petroleum Contaminated Soils.

generated or the beneficial use does not meet the state's definition of recycling.[3] See Figure 1.2 for a comparison of Washington waste generation using all waste types.[4] See Chapter V, Table 5.7, for a list of the quantities of reported materials from 1999 to 2001.

SW&FAP will continue to collect more of this information on future surveys. For the most part, these materials are collected and processed outside of the traditional residential and commercial waste stream and were not well addressed in the Waste Not Washington Act of 1989. Still, the creative efforts of local governments and businesses are recognized in addressing these wastes. This is not an exhaustive list, neither are the numbers complete for these material categories.

Figure 1.2
Washington Waste Generation 1999 to 2001
Including Waste "Diversion"



Beyond Waste--The State Solid Waste Strategic Plan

The Solid Waste and Assistance Program (SW&FAP) is continuing in its efforts to revise the state solid waste plan pursuant to state law (RCW 70.95.260). The plan is being revised in concert with the state hazardous waste plan revision. Together, the two plans comprise Ecology's Beyond Waste project, one of the agency's top priorities. We expect to complete a draft plan in the Fall of 2003.

While wastes in Washington are being managed better than ever before, we are generating more waste than ever before. In fact, the generation of solid wastes is growing at an even faster pace than population growth. Reducing wastes, toxic substances, and their impacts is important for our state's future. Washington can transition to a society that views wastes as inefficient uses of resources and believes that most wastes can be eliminated. Eliminating wastes will contribute to environmental, economic and social vitality.

[3] Revised Code of Washington 70.95.030 (18) "Recycling" means transforming or remanufacturing waste materials into usable or marketable materials for use other than landfill disposal or incineration.
[4] Other waste types includes demolition, inert, wood, tires, medical wastes and other wastes. It excludes industrial wastes, asbestos, sludges, and petroleum contaminated soils.

Ecology is committed to continuing to work collaboratively with people and organizations interested in waste-related issues. Combined public meetings on proposed actions for both the solid waste and hazardous waste plans will be held as policy options are developed.

In the short-term, the solid waste plan will position Washington to be more effective in reducing wastes through revised policies and programs, including better service to the public, business and government. In the long-term, the Beyond Waste project will guide Washington in a new direction, from containing and managing wastes to preventing wastes from being generated in the first place. This transition will take place as we redesign processes, change consumer and corporate behaviors, re-use more materials, and improve technologies. Moving beyond waste to re-use and reduction of materials will take many years. In the interim, the existing handling systems must be maintained or improved where needed.

Statewide Litter Prevention Strategy

The Solid Waste and Financial Assistance Program (SW&FAP) launched its "Litter and it will hurt" campaign in April 2002, aimed at reducing litter on Washington roadways by letting people know littering can lead to fines that hurt financially.

The campaign uses multiple strategies over a three-year period to raise awareness, alter beliefs and change behaviors. Elements include humorous television and radio advertisements during the summer months, a year-round litter hotline, increased enforcement, roadway and retail signs, a Web site (http://www.ecy.wa.gov/programs/swfa/litter/, and distribution of litterbags and campaign materials.

In a September 2002, comparison to an April 2002, benchmark study, results showed:

- 51 percent of respondents had seen or heard the slogan "Litter and it will hurt" (up from 14 percent in the benchmark study).
- 70 percent of respondents remembered seeing road signs, posters or a slogan about litter (up from 57 percent).
- 32 percent remembered seeing or hearing advertising, news or public service messages about littering (up from 23 percent).
- 28 percent were aware of a toll-free number to report littering (up from 20 percent).
- 17 percent believed they are not likely to get caught and fined. This is down from 27 percent in April who believed they were not likely to get caught.
- 42 percent of respondents would say that fines for littering are very severe or severe (up from 31 percent).

At the end of the three years, SW&FAP will conduct a full survey of the quantity and types of litter in Washington to measure the effects of the campaign.

The ad campaign will start again in the spring of 2003, but the toll-free litter hotline is still operating. Citizens may report the license-plate numbers of litterers by calling 866-LITTER-1. The registered owner of the vehicle then receives a stern letter from Washington State Patrol.

There were 55 calls in April, increasing to 941 in July, 1,129 in August, and then decreasing slightly 1,027 in September, when the ad campaign ended.

The Washington State Patrol is playing a key role in the new litter campaign. From May to August 2002, 1,755 litter citations were issued by patrol officers. Twenty-three percent of those citations were for "lit-debris" (e.g., a lit cigarette butt), which carries a $950 fine.

Product Stewardship

Waste management programs in Washington State have improved greatly over time. Our landfills are more protective of human health and the environment and more materials are being recovered for recycling. However, despite enormous efforts to increase recycling rates, we continue to fall short of our goals and waste generation continues to rise.

It is understood that waste disposal contributes to air, water and land pollution. What is not well understood is that environmental impacts begin long before we discard the many products we use each day. Waste and pollution occur throughout the lifecycle of a product. Impacts from resource extraction, product development, distribution and product use can actually dwarf pollution resulting from waste disposal at the end of a product's useful life. It is becoming evident that traditional waste reduction and recycling programs aren't enough to relieve these full life-cycle impacts. Waste reduction programs as they are now employed cannot compete with the increase in the quantity and complexity of consumer products produced and discarded in Washington. The current situations place unnecessary economic burden on governments and tax payers alike.

As we look to the future, it is important to keep in mind that both population and waste generation in Washington State are projected to increase substantially. Additionally, the composition of the waste stream will continue to grow in complexity as new technologies emerge in product development and manufacture. In light of these forecasts, it is equally important that state and local governments alike support and assist in development of innovative approaches focused on reducing the adverse health and environmental impacts of consumer products. The waste reduction strategies we choose must continue to take into consideration a wide array of public policy issues, including those relating to public health and safety, natural resource management, environmental protection and solid and hazardous waste management, while ensuring a healthy and competitive economy. To achieve this result, many government agencies have begun promoting product stewardship strategies that aim to encourage manufacturers and others influencing the life cycle of a product to take increasing responsibility to reduce the impacts of that product.

Product stewardship is an environmental management strategy in which responsibility for minimizing a product's environmental impact throughout all stages of the product's life cycle falls on those who design, produce, sell, or use that product. Product stewardship encourages manufacturers to take increasing responsibility for all of the impacts associated with a product and its packaging – including energy and materials consumption, air and water emissions, worker safety, and waste disposal – including the end-of-life management of the products they produce. This shifting of responsibility for product impacts creates incentives for manufacturers to design products with fewer toxics, and to make them more durable, reusable, and recyclable. These strategies can pay off for the manufacturer in the form of reduced production costs, reduced toxics handling and waste disposal, less regulatory burden and market advantage as consumers begin specifying products based on their environmental performance. (Note: This shift does not relieve consumers, government, and others from their responsibility to be stewards. Rather, it recognizes that many of the processes are under primary control of manufacturers.)

Product stewardship strategies and initiatives are already underway in the United States and abroad and appear in many different forms, tailored to address specific issues and needs. Examples of product stewardship practices include:

- **Design for the Environment -** Product manufacturers reduce environmental impacts by using materials and processes that result in the least environmental impacts. Examples include designing products that contain recycled and/or recyclable materials, designing products to be easily disassembled to reuse parts, using low or no toxicity materials and using production methods that conserve energy and resources.
- **Product Take-Back** - A system whereby consumers can return used products for reuse and/or recycling. This system could be funded through a stakeholder partnership or solely by the manufacturer. When the manufacturer shares in the costs of managing the products, they are more likely to consider design and materials changes that will reduce recovery costs and reduce environmental impacts.
- **Offering the Product as a Service (Leasing)** - In many cases the consumer may not be interested in owning a product, but wants the service the product provides. For example, consumers may not want to own the plastics and glass in a television set; rather, they want the service--viewing of TV programs--that the television set provides. Companies that lease their products have a greater incentive to design more durable, lasting products that can be reused or recycled cheaply and efficiently.

Ecology recognizes the need for industry, government, and consumers to jointly promote the development and use of consumer products that pose no–or increasingly fewer–health and environmental impacts. Ecology is currently working with other government agencies, both regionally and nationally, in a coordinated effort to promote product stewardship. The primary approach has been to identify specific products that pose the

most substantial lifecycle impacts and to work directly with manufacturers to develop product stewardship initiatives focusing on those products. In large part, government agencies responsible for solid and hazardous waste management are initiating these programs. As a result, products that pose serious disposal problems, because of their volume, toxicity or because they are difficult to recycle, tend to gain focus. Products of interest currently include: electronics (such as computers and televisions), products containing mercury, paint, pesticides, carpet and tires. Some of the initiatives that the Solid Waste & Financial Assistance Program are working on with its partners are outlined in *Chapter III Partnering for the Environment.*

Information Technology and the Web

The past year has been significant for the Solid Waste & Financial Assistance Program (SW&FAP) in terms of progress on Information Technology initiatives. Staff have drafted the following vision statement for the role of Information Technology in implementing program elements:

> *Staff are comfortable with the use of information technology. All stakeholders - the public and regulated community, and other government agencies - are familiar with and accepting of providing and obtaining real - time information in a paperless fashion. Automation and integration of tasks through the use of information technology is a primary front-end consideration in implementing program activities.*

Continued pressure on agency and program operating budgets, as well as pressures at the local level, clearly call for as many efficiencies as can possibly be had. The ability to provide and convey information over the Internet represents a huge gain in efficiency and accessibility of resources. At the same time, we are cognizant that not all of our stakeholders have the same access to information technology, or even where access is available, the same level of comfort. Therefore our approach must be thoughtful of those constraints.

One of the easiest efficiencies to be found via the Internet is dissemination of publications. The Program incurs substantial costs in printing, processing requests for, and mailing publications. Program publications are now routinely available in PDF format on the agency web site http://www.ecy.wa.gov/pubs.shtm allowing users instant access to information. This approach is also in keeping with the concept of sustainability as it reduces consumption of our natural resources.

Limitations remain even with this approach, however. In some cases a hard copy of the document is wanted, and in other cases documents can be large, and user access speeds slow enough that downloading them over the Internet is not practical. In those cases it is often feasible to mail electronic copies on disk or provide a hardcopy publication.

The Internet site for the SW&FAP has been completely revised over the past year. We have taken a different approach in guiding visitors through our site. On the main page at http://www.ecy.wa.gov/programs/swfa/index.html visitors encounter three questions: What do we do? What type of waste? and Where can I get more information? There is also a Who we are prompt? which leads to directories of program staff and outside contacts, and a What's new in solid waste? feature so that visitors can see the latest news and information from the Program. Visitors can also click on a list of website topics.

A significant shift in our use of information technology is a transition to Active Server Pages. Many web pages found on the Internet are static pages – that is, what you see is what there is. The information provided is only as good as the last update. SW&FAP is moving toward pages that provide something closer to real-time information. An increasing number of pages will be linked to data bases, and as those data bases are updated the available information will change for users. We will use the same kind of technology to begin collecting information from stakeholders as well. In the not too distant future users will be able to submit reports through on-line forms, add their name to the list of persons interested in a particular subject area. Our goal is a two-way exchange of information.

SW&FAP encourages readers to visit our web pages at http://www.ecy.wa.gov/programs/swfa/index.html and explore the information and resources available there. The Program is committed to expanding our web presence and providing the most efficient possible service delivery. Where applicable, web sites are identified throughout this report.

Chapter II Solid Waste Handling Infrastructure

This chapter describes the basic facilities making up the solid waste management infrastructure within Washington state. While disposal and recycling information is from 2001, the lists of facilities are current as of September 2002.

Once solid waste is generated, its handling can be categorized into three distinct classifications. Solid waste can either be: (1) landfilled; (2) intermediately handled - stored, transferred, processed; or, (3) incinerated. A fourth category, Ancillary-Other, explains anomalies to the three basic classifications of solid waste handling. Biosolids landspreading sites are not included in the total number of facilities.

Moderate risk waste is, by definition, excluded from regulation as dangerous waste, even though it may have the characteristics of dangerous waste. Moderate risk waste fixed facilities are regulated as interim solid waste handling sites.

Regulated solid waste facilities in the state are covered by three rules developed by Ecology. The first rule, chapter 173-304 WAC, *the Minimum Functional Standards* (MFS) identifies 16 distinct solid waste facility types, each with its own set of permitting criteria. The solid waste facility standards have been revised in chapter 173-350 WAC, *Solid Waste Handling Standards* (planned adoption January 2003). There will be some changes to the facility types, most notably the elimination of woodwaste landfills and inert/demolition landfills. There will continue to be a limited purpose landfill category and an inert landfill category, which will take only waste identified in rule as "inert." There will be a transitioning time for currently facilities to either be permitted under the new rule or to close under the MFS.

The second rule pertains to municipal solid waste landfills, chapter 173-351 WAC, *Criteria for Municipal Solid Waste Landfills*.

The third rule regulating solid waste handling facilities is chapter 173-306 WAC, *Special Incinerator Ash Management Standards*, which sets permitting, construction and operating standards for MSW incinerator ash monofills.

In this report, Ecology has identified 406 solid waste handling facilities in Table 2.1 (MRW facilities are not included in the number). Facility ownership in this chapter is categorized as either PUBLIC for those facilities owned by a recognized jurisdiction of government - a city, county or special purpose district - or as PRIVATE, for those facilities owned by corporations, partnerships or private individuals.

Table 2.1
Classification Table

Classification Facility Type	Statewide Total
Landfills	**72**
Ash Monofills	1
Inert/Demolition Waste Landfills	32
Limited Purpose Waste Landfills	15
Municipal Solid Waste Landfills	19 *
Woodwaste Landfills	5
Intermediate Classification	**311**
Compacting Stations	7
Compost Facilities	40
Drop Boxes	70
Piles	12
Recycling Facilities	83
Surface Impoundments	5
Transfer Stations	92
Tire Piles	2
Incineration	**4**
Ancillary/Other	**19**
Landspreading Disposal Facilities	13
Other Facilities	6
Total All Facilities	**406**

* Includes one MSW landfill constructed but not operating.

As an overview of the solid waste facilities in the state, Table 2.2 identifies the types and number of facilities and the county in which they are located. This table includes only those facilities that are separately permitted in chapter 173-304 WAC or chapter 173-351 WAC. Several other "facility types" exist but are co-located at another permitted facility. This is especially true for composting and MRW facilities. Future reports will identify all of the facility types, whether they are separately permitted or co-located with other facilities.

For a greater understanding of Washington's solid waste infrastructure, a closer examination of each solid waste infrastructure classification and applicable "type" sub-category follows. Maps showing the counties where the facilities are located are included for each category. See Appendix A for a map identifying counties.

Table 2.2
Solid Waste Facilities in Washington
(as of September 2002)

	LANDFILLS				INTERMEDIATE										
County	MSW Landfill	Wood Waste	Inert/Demolition	Limited Purpose	Ash Monofill	Compacting Station	Compost Facility	Drop Boxes	Piles	Recycling Facility	Surface Impoundments	Transfer Stations	Tire Piles	Incinerators	Other
Adams							1			2		2			
Asotin	1		1												
Benton	1		2					1		3		5			1
Chelan			3							1		3			
Clallam	1			1			1			1		3			
Clark				2			2			8		2			1
Columbia							1			1		1			
Cowlitz	1			1			1	1		3		1			
Douglas	1		2									1			1
Ferry												1			
Franklin							1		1	3		1			
Garfield												1			
Grant	2			1			1	15		3					
Grays Harbor		1	1						1	9	2	6	1		
Island			1			2	1			10	1	3			
Jefferson			1	1			2	1	1			1			
King	1		1				4	2		1		12			
Kitsap			1				1	5		2					
Kittitas			1								1	2			
Klickitat	1				1			2				3	1		
Lewis			1				1	8		1		3			9

	LANDFILLS				INTERMEDIATE										
County	MSW Landfill	Wood Waste	Inert/Demolition	Limited Purpose	Ash Monofill	Compacting Station	Compost Facility	Drop Boxes	Piles	Recycling Facility	Surface Impoundments	Transfer Stations	Tire Piles	Incinerators	Other
Lincoln										1		1			
Mason		1		1				3				1			
Okanogan	1											2			
Pacific								3				3			
Pend Oreille												3		1	
Pierce	3		2	3			4	1	3	11		11		1	4
San Juan								2			2				
Skagit						5	5	1				1			
Skamania										1		3			
Snohomish	1*	3	1				5	6		1		3			1
Spokane	1		7	1			2		2	7		5		2	
Stevens	1			1								4			
Thurston							2	3		8		1			1
Wahkiakum								1	1						
Walla Walla	1		1				2		1						
Whatcom			1	2			1	8		5		2			1
Whitman			1	1			1			1		1			
Yakima	2		4				1	7	2						2
TOTAL	19	5	32	15	1	7	40	70	12	83	5	92	2	4	16

*The landfill in Snohomish County is permitted but not operating

Landfill Classification

The regulated permanent disposal of solid wastes in landfills in Washington occurs in five types of facilities: (1) ash monofills; (2) inert/demolition landfills; (3) limited purpose landfills; (4) municipal solid waste landfills; and (5) woodwaste landfills. (See Table 2.3.) A short discussion of each landfill classification "facility type" and its relationship to the state's overall infrastructure follows. A more detailed discussion of waste types and amount disposed and incinerated, movement of waste into and out of state, as well as trends in waste management, is found in Chapter VI.

Table 2.3
Landfill Classification

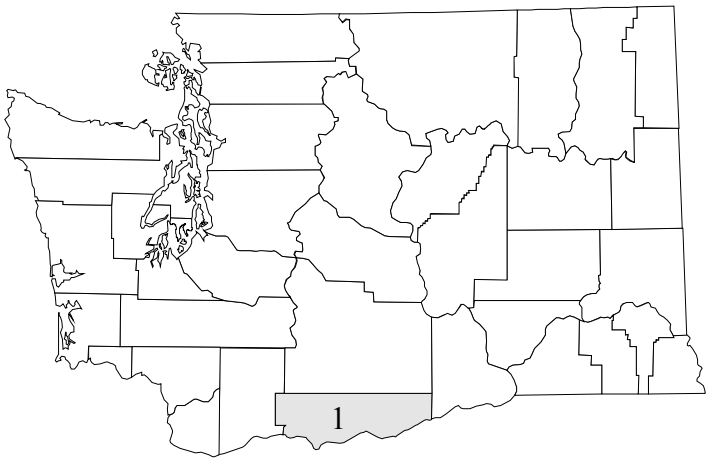
FACILITY TYPE	TOTAL # STATEWIDE		TOTAL BY OWNERSHIP DESIGNATION			
	Active	Active	Public		Private	
	2001	2002	2001	2002	2001	2002
Ash Monofill	1	1	0		1	1
Inert/demolition	31	32	11	10	20	22
Limited Purpose	16	15	1	1	15	14
Municipal solid waste	21	19*	15	15	6	4
Woodwaste	4	5	0	0	4	5
TOTAL	73	72	27	26	46	46

* A landfill in Snohomish County is permitted but not operating.

Ash Monofills

Ash monofills are landfill units that receive ash residue generated by municipal solid waste incinerator/energy-recovery facilities. The *Incinerator Ash Residue Act*, chapter 70.138 RCW, gave direct permitting authority to Ecology, as well as giving the department the authority to develop rules to regulate the disposal of this ash. Under chapter 173-306 WAC, *Special Incinerator Ash Management Standards*, incinerators which burn more than 12 tons per day of municipal solid waste are required to have a Generator (Ash) Management Plan, approved by Ecology, in place prior to operation of a facility. The ash management plan identifies the location of ash monofills to be used for ash disposal.

Location of Ash Monofill



Public	0
Private	1
Total	1

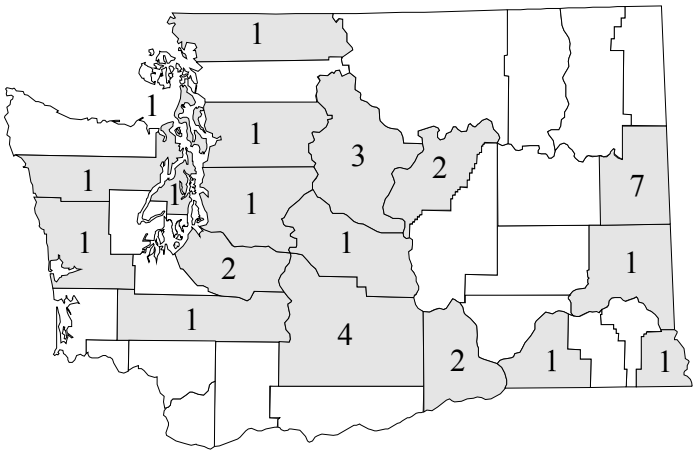
In 2002, there was only one permitted ash monofill in Washington, located at the Roosevelt Regional Landfill in Klickitat County. The monofill operates under a permit issued by Ecology, and received 76,523 tons of special incinerator ash in 2001.

Inert/Demolition Waste Landfills

Inert/Demolition Waste landfills are facilities which receive "more than two thousand cubic yards of inert wastes and demolition wastes."[5] These facilities are regulated under WAC 173-304-461.

Thirty-three of the inert/demolition landfills reported 733,843 tons of waste in 2001. In 2002, there were 32 inert/demolition landfills listed for the state. Most (65%) of the inert/demolition landfills are privately owned and operated. Public inert/ demolition landfills make up 35% of this facility type.

Location of Inert/Demolition Waste Landfills



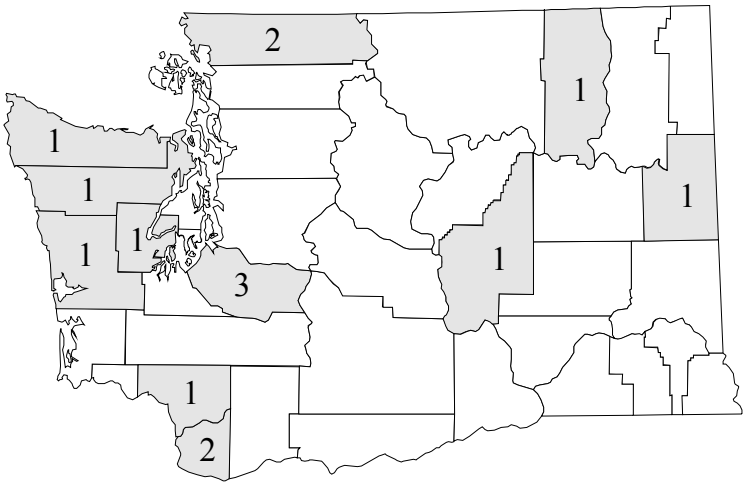
Public	10
Private	22
Total	32

[5] WAC 173-304-461(1)

Limited Purpose Waste Landfills
Limited purpose landfills are facilities that receive "solid wastes of limited types, known and consistent composition, other than woodwaste, garbage, inert waste and demolition waste."[6] These facilities are regulated under WAC 173-304-460(5). Limited purpose landfills are identified by the type of waste. In other words, the waste associated with a limited purpose landfill is unique to that facility.

Thirteen limited purpose landfills that reported in 2001, accepted 645,592 tons of waste. The waste disposed in these facilities is usually generated by the owner of the landfill. Only one limited purpose landfill is publicly owned.

Limited Purpose Landfills



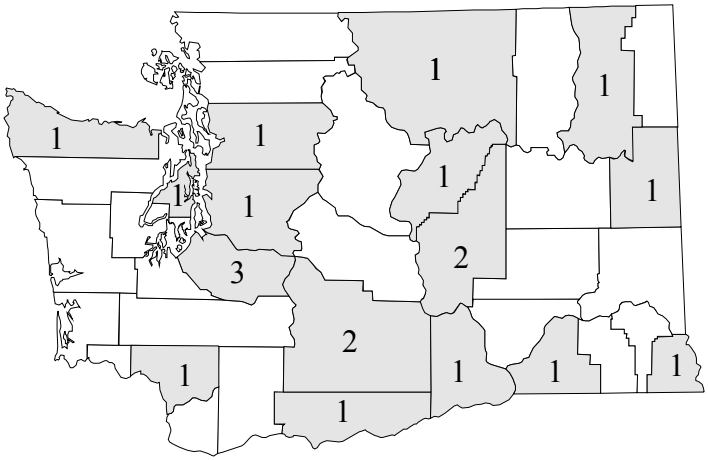
Public	1
Private	14
Total	15

Municipal Solid Waste Landfills
In 2001, 20 MSW landfills accepted 4,525,019 tons of waste. (See Chapter VI for additional discussion of waste types, amounts and sources.)

In 2002, of the 18 operating MSW landfills, the majority, 79%, of MSW landfills are operated by public entities. This has historically been true in Washington. Private MSW landfills constitute only 21% of this facility type. Even though most of the landfills are owned by public entities, the majority of landfill capacity (87%) is under the control of the private sector. (See the discussion on landfill capacity, in Chapter VI.)

[6] WAC 173-304-100(98)

Location of MSW Landfills



Public 15
Private 4
Total 19

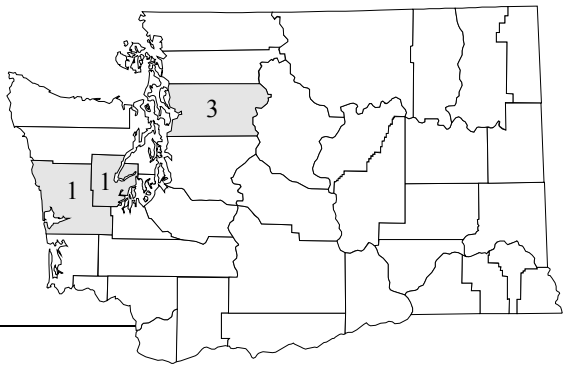
* Includes landfill in Snohomish County that is permitted, but not operating.

Woodwaste Landfills
Woodwaste landfills are those facilities which landfill "more than 2,000 cubic yards of woodwaste, including facilities that use woodwaste as a component of fill."[7]
These facilities are regulated under WAC 173-304-462.

The MFS defines woodwaste as "solid waste consisting of wood pieces or particles generated as a by-product or waste from the manufacturing of wood products, handling and storage of raw materials and trees and stumps. This includes, but is not limited to, sawdust, chips, shavings, bark, pulp, hog fuel, and log sort yard waste, but does not include wood pieces or particles containing chemical preservatives such as creosote, pentachlorophenol, or copper-chrome-arsenate."[8]

In 2001, one woodwaste landfills reported 53,298 tons of waste (the remaining permitted woodwaste landfills were either inactive or were actually removing waste). In 2002, five woodwaste landfills were listed in the state list, all privately owned.

Location of Woodwaste Landfills



Public 0
Private 5
Total 5

[7] WAC 173-304-462(1)

[8] WAC 173-304-100(91)

Intermediate Classification

Solid waste, prior to its final disposal or incineration, is often accumulated at a storage facility, consolidated at a transfer station, converted into a useful product, or prepared for recycling or disposal at a processing center. The storage, transfer or processing of solid wastes are regulated by the MFS and fall under the interim[9] or intermediate classification of solid waste handling facilities. Some moderate risk waste fixed facilities are regulated as interim solid waste handling sites.

Specifically, a storage facility primarily holds "solid waste materials for a temporary period"[10] while a processing center is in the operation of converting "solid waste into a useful product or to prepare it for disposal."[11] A transfer station, on the other hand, is a "permanent, fixed, supplemental collection and transportation facility, used by persons and route collection vehicles to deposit collected solid waste from off-site into a larger transfer vehicle for transport to a solid waste handling facility."[12]

The distinguishing characteristic of all interim or intermediate classification solid waste handling facilities is that they are not designed for final disposal. There are 10 types of intermediate facilities: (1) baling stations; (2) compacting stations; (3) composting facilities; (4) drop boxes; (5) moderate risk waste fixed facilities; (See Chapter VII) (6) piles; (7) recycling centers; (8) surface impoundments; (9) transfer stations; and (10) tire piles.

Bale Station
A bale station is a facility that processes loose solid waste into large bound bundles. The purpose of binding waste in this fashion is to place the bundles into lifts at a landfill. These facilities are regulated under WAC 173-304-410. Because this technology is often confused with compacting stations, and since bale stations are regulated under the same section of the MFS, to date no bale stations have been permitted as separate facilities.

Compacting Station
A compacting station is a facility which employs mechanical compactors to compress solid wastes into dense packets of material for shipment. These facilities are regulated under WAC 173-304-410.

Ecology identified seven compacting stations statewide in 2002. All compacting facilities are under public ownership and are affiliated with recycling operations. Compacting stations are located in the more urban, northwestern counties of the state. Larger urban centers are more inclined to use this technology to process large amounts of recyclables for shipment. Compactors are also used at transfer stations, though they are not permitted separately.

[9] WAC 173-304-100(38)

[10] WAC 173-304-100(76)

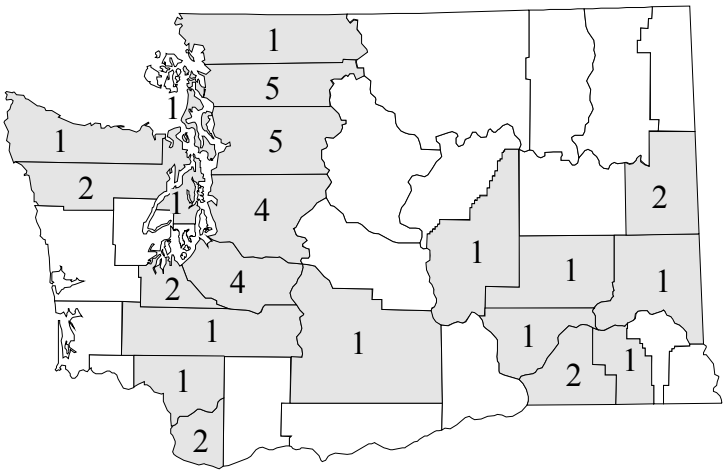
[11] WAC 173-304-100(62)

[12] WAC 173-304-100(82)

Compost Facilities
A compost facility is a facility which promotes the biological decomposition of organic solid waste, and other organic material, yielding a product for use as a soil conditioner. Composting is considered a key element of the state's strategy of reaching the statewide 50% recycling goal.

Compost facilities are currently regulated under two sections of the MFS: the pile standards (WAC 173-304-420), or the recycling facility standards (WAC 173-304-300). Jurisdictional health departments have the authority to decide under which standards, or combination of standards, compost facilities should be regulated. Most compost facilities are currently permitted under the more stringent pile standards due to their potential to generate leachate. There are 40 compost facilities identified statewide in 2002. Some of these are co-located at other solid waste facilities and may not have a separate permit.

Location of Compost Facilities



Public	16
Private	24
Total	40

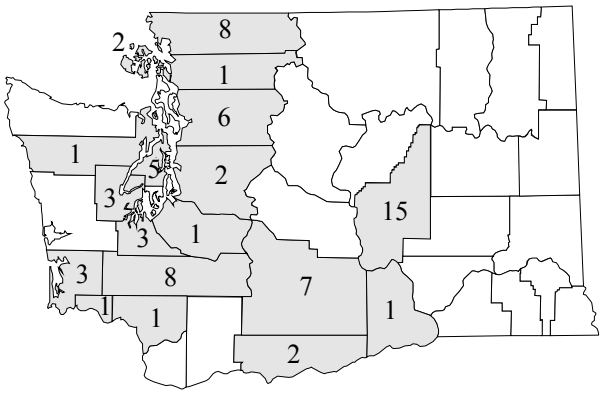
Drop Boxes
A drop box is defined in the MFS as "a facility used for the placement of a detachable container including the area adjacent for necessary entrance and exit roads, unloading and turn-around areas."[13] It is regulated under WAC 173-304-410.

Drop boxes normally serve the general public by receiving loose loads of waste that are transported to the site by an individual for later disposal or recycling. Typically drop boxes for household waste are located in the more rural portion of counties.

Ecology identified 70 operating drop boxes in 2002. The map depicts the profile of regulated drop boxes statewide. The majority, over 87%, are public and are primarily operated by county public works departments.

[13] WAC 173-304-100(25)

Location of Drop Boxes

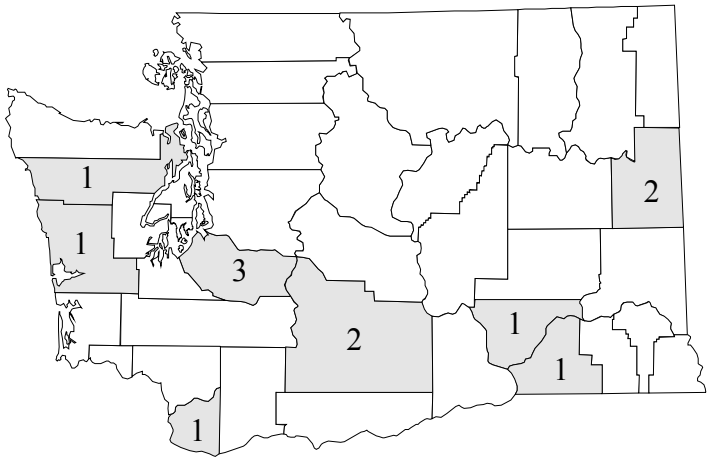


Public 61
Private 9
Total 70

Piles

A solid waste pile is described in the MFS as any "non-containerized accumulation of solid waste that is used for treatment or storage."[14] Pile storage/treatment areas are usually associated with the storage and processing of wastes requiring remedial actions, such as petroleum-contaminated soils. Pile facilities or areas used for storage and treatment are regulated by WAC 173-304-420. (Compost facilities can also be regulated under this section as discussed above.) Twelve privately owned piles (non-composting) were identified in 2002.

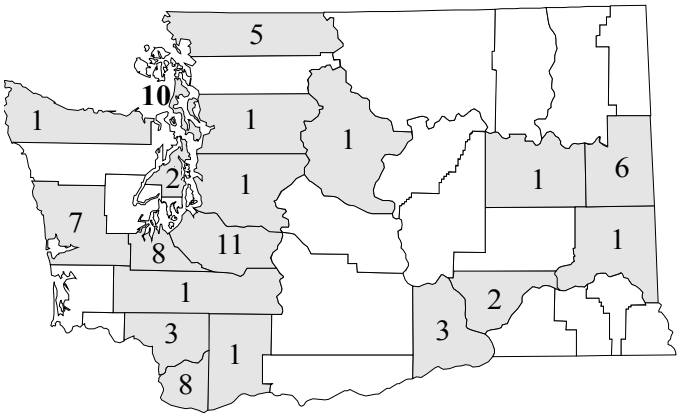
Location of Piles



Public 1
Private 11
Total 12

[14] WAC 173-304-100(56)

Location of Recycling Facilities



Public	4
Private	50
Total	54

Recycling Facilities

A regulated recycling facility refers to an operation engaged in the collection and utilization of solid waste for the purpose of transforming or re-manufacturing the waste materials into usable or marketable materials for use other than landfill disposal or incineration. Chapter 70.95 RCW, the *Solid Waste Management Act* refers to "recyclable materials" as "those solid wastes that are separated for recycling or reuse, such as papers, metals, and glass, that are identified as recyclable material pursuant to a local comprehensive solid waste plan."[15] Recycling facilities are regulated under WAC 173-304-300.

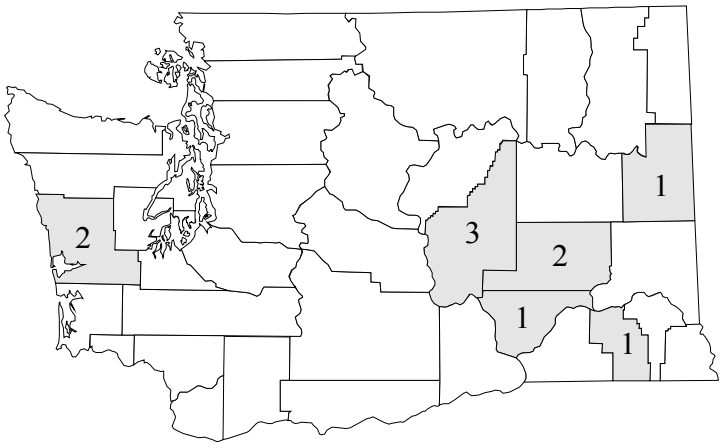
It is important to note that many types of recycling facilities are not regulated by the MFS. For example, the regulations do not apply to single family residences and single family farms engaged in composting of their own wastes (exempt from any other regulations); facilities engaged in the recycling of solid waste containing garbage, such as garbage composting; facilities engaged in the storage of tires; problem wastes; facilities engaged in recycling solid waste stored in surface impoundments, which are otherwise regulated in the MFS (WAC 173-304-400); woodwaste or hog fuel piles to be used as fuel or raw materials stored temporarily in piles being actively used; nor do they apply to any facility that recycles or uses solid wastes in containers, tanks, vessels, or in any enclosed building, including buy-back recycling centers. Composting and land application of materials are regulated under other portions of chapter 173-304 WAC.

Because of the distinction between regulated recycling facilities and non-regulated activities that promote recycling, only 54 recycling facilities permitted under the MFS requirements were identified in 2002. The majority (93%) of the regulated recycling facilities were private facilities and public recycling facilities constituted 7% of this facility type.

Under the MFS, land application of materials is permitted as a "recycling facility." Because land application of materials is much different than a traditional recycling facility, these sites were separated out for this annual report. Ten private land application sites were identified in 2002.

[15] RCW 70.95.030(14)

Location of Land Applications



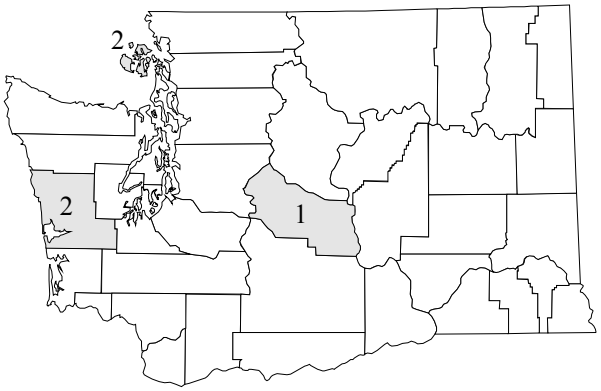
Public	0
Private	10
Total	10

Surface Impoundments

A surface impoundment refers to "a facility or part of a facility which is a natural topographic depression, man-made excavation, or diked area formed primarily of earthen materials (although it may be lined with man-made materials), and which is designed to hold an accumulation of liquids or sludges. The term includes holding, storage, settling, and aeration pits, ponds, or lagoons, but does not include injection wells."[16]

Some surface impoundments are regulated under WAC 173-304-430.[17] Ecology identified five regulated facilities in 2002. The category remains in the intermediate classification pending interpretation or clarification under the biosolids rule. Four of the regulated surface impoundment facilities are publicly-owned and one is privately owned.

Location of Surface Impoundments



Public	4
Private	1
Total	5

[16] WAC 173-304-100(80)

[17] Surface impoundment facilities permitted under federal, state or local water pollution control laws are excluded from regulation under WAC 173-304-430.

Transfer Stations
A transfer station is defined as "permanent, fixed, supplemental collection and transportation facility, used by persons and route collection vehicles to deposit collected solid waste from off-site into a larger transfer vehicle for transport to a solid waste handling facility."[18] The regulations applicable to transfer stations are contained in WAC 173-304-410.

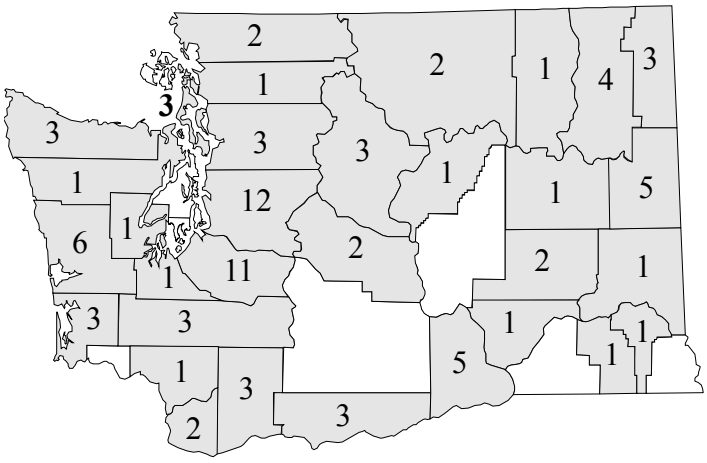
Typically, transfer stations are areas where individual collection vehicles can be off-loaded, the waste stored for a short period of time and reloaded onto larger vehicles for transfer to the disposal facility.

In the past, transfer stations were generally located in larger, urban areas; however, with the new federal regulations applicable to municipal solid waste landfills, jurisdictions are now viewing transfer stations as an option to operating a landfill. Wastes can be collected at these centers for long-hauling to regional MSW landfills.

Transfer stations often have areas where the public can bring waste for disposal. Many also have recycling facilities and/or household hazardous waste collection areas. There were 92 regulated transfer stations operating in 2002.

The profile map shows that 61% of the transfer stations continue to be publicly operated entities.

Location of Transfer Stations

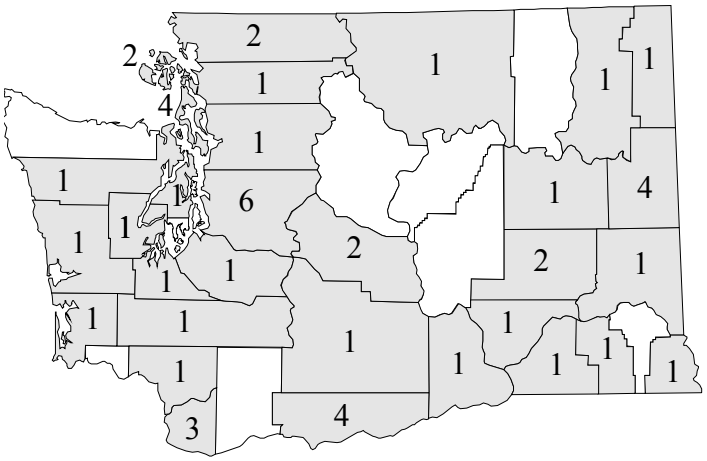


Public	56
Private	36
Total	92

[18] WAC 173-304-100(82)

Moderate Risk Waste Facilities
Moderate risk waste is, by definition, excluded from regulation as dangerous waste, even though it has the characteristic of dangerous waste. Moderate risk waste fixed facilities

Location of MRW Sites



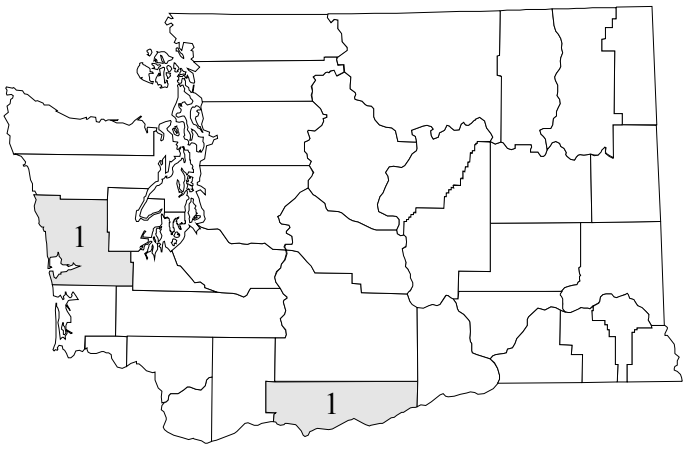
Public	42
Private	3
Total	45

are regulated as interim solid waste handling sites. Some of these facilities are co-located at other types of permitted facilities, such as transfer stations and landfills, and do not receive a separate permit. See Chapter VII Moderate Risk Waste Collection System for additional information.

Tire Piles
In Washington state, about 5.5 million used tires are generated each year. The used tires may be taken to tire pile storage facilities. A regulated tire pile facility in Washington is any tire pile that temporarily stores or accumulates more than 800 tires. Tire pile standards are contained in WAC 173-304-420.

A major problem with used tires has been illegal tire piles. This section, however, deals specifically with regulated tire piles. Ecology identified two permitted tire piles in the state in 2002, both privately owned.

Location of Permitted Tire Piles



Public	0
Private	2
Total	2

Incineration Classification

An energy recovery facility is considered a combustion plant which specializes in the "recovery of energy in a useable form from mass burning or refuse-derived fuel incineration, pyrolysis or any other means of using the heat of combustion of solid waste that involves high temperature (above twelve hundred degrees Fahrenheit) processing."[19] By definition, incineration as it applies to solid waste materials means "reducing the volume of solid wastes by use of an enclosed device using controlled flame combustion."[20]

Energy recovery and incinerator facilities are regulated under WAC 173-304-440 applies to "all facilities designed to burn more than twelve tons of solid waste per day, except for facilities burning woodwaste or gases recovered at a landfill."[21]

In 2001, Ecology identified four regulated solid waste incinerator facilities that burned a total of 496,152 tons of waste.

In addition to solid waste handling permit requirements under the MFS, solid waste incinerators may be subject to regulations under chapter 70.138 RCW, the *Incinerator Ash Residue Act*. The rules implementing this, chapter 173-306 WAC, *Special Incinerator Ash Management Standards*, require certain solid waste incinerators to prepare generator (ash) management plans. These rules do not apply to the operation of incineration or energy recovery facilities that burn only tires, woodwaste, infectious waste, sewage sludge or any other single type of refuse, other than municipal solid waste. They also do not apply to facilities which burn less than 12 tons of municipal solid waste per day

Of the four solid waste incinerators permitted in 2002, only one, the Spokane Regional Waste-to-Energy Facility, is subject to both the requirements of chapter 173-304 WAC and chapter 173-306 WAC. It is required to have a generator ash management plan, approved by Ecology, which discusses the handling, storage, transportation and disposal of the incinerator ash. Currently the City of Tacoma Steam Plant is inactive.

Ancillary - Other Classification

The classification of Ancillary - Other, is not covered or spelled out in regulation but is included here to explain certain anomalies discovered in the reporting process that may have an effect in subsequent reporting years. To qualify for inclusion in this category, a facility type must be either under regulatory modification, be exempted from regulation, or determined to be an obscure facility type needing reclassification or elimination outright.

[19] WAC 173-304-100(26)

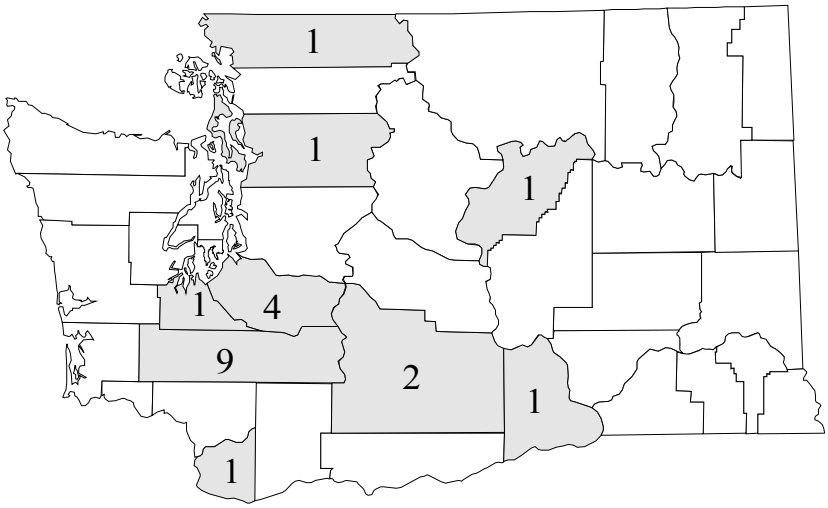
[20] WAC 273-304-100(37)

[21] WAC 173-304-440(1)

Landspreading Disposal Facilities
A landspreading disposal facility under the MFS is a facility that applies sludges or other solid wastes onto or incorporates solid waste into the soil surface at greater than agronomic rates and soil conditioners/immobilization rates. Landspreading disposal facilities are regulated under WAC 173-304-450. There were thirteen landspreading sites identified, as well as one sludge and one septage facility in 2002. (Many sites using biosolids for land application are permitted under the new biosolids regulation discussed Chapter III.)

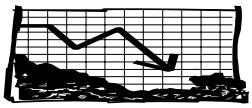
Other Facilities
The "other" category of facility types is an actual category of the MFS and applies to "other methods of solid waste handling such as a material resource recovery system for municipal waste not specifically" identified elsewhere in the MFS. The specific regulations for "other" facilities are in WAC 173-304-470. This type of facility is basically a miscellaneous category which is designed to cover new solid waste technologies that are developed between MFS revisions. There were two sites included in the 2002 database. One treated PCS and one vactor waste.

Location of Landspreading and Other Facilities



Public	7
Private	14
Total	21

Chapter III Partnering for the Environment



Ecology's Solid Waste and Financial Assistance Program (SW&FAP) is preparing itself to participate in the "Next Industrial Revolution" by forging working partnerships with public and private sector organizations who are or will be the leaders of that revolution.

SW&FAP has been reaching out to offer financial assistance, technical expertise, task force leadership, educational and planning assistance, and moral support to old and new friends in business, industry, agriculture and local government.

Already this outreach has produced significant environmental results and tremendous promise for fundamental and progressive shifts in our relationships with the natural environment.

SW&FAP has provided technical and financial assistance to help local governments support these management programs and to permit and regulate solid waste management facilities. Over the last several years, government funding has become tighter while waste generation has increased and many solid and moderate risk waste issues have become more complex. As recognized by many government, community, and business leaders, pioneering new ways to solve these problems and making progress toward implementing more sustainable resource management practices is the key to the state's environmental, economic, and social well-being. These solutions require the participation and cooperation of many people who bring with them a variety of expertise, perspectives, creative ideas, and resources.

This change in the way we do business with local government and businesses has begun with a clear-eyed assessment of what can and should be done to help us all move toward a sustainable world. The first step has been a recognition that we are all partners in the work ahead. To that end, a team of specialists assigned to work on building the relationships to foster sustainability has set to the work described in the following pages.

Partnering for the Environment through Local Planning

Local solid waste planning is the cornerstone of solid waste management in Washington state. The state Legislature asks counties and cities to make sound solid waste handling decisions based on approved and "current" comprehensive solid waste management plans (RCW 70.95.110(1)).

These comprehensive plans detail and inventory all existing solid waste handling facilities within a county and provide an estimate of long-range needs for solid waste facilities projected over a 20-year period. The plans are intended to serve as a guiding document for a county to develop its infrastructure. Since 1989, counties and cities have been required to provide detailed information on waste reduction strategies and recycling programs and schedules for program implementation in the plans.

Ecology provides technical assistance to local governments in preparing and implementing their plans. Ecology also approves the plans. Table 3.1 identifies the local solid waste plans for each county and two cities, Seattle and Everett, that do individual plans. This table shows the status of each local comprehensive solid waste management plan for each county, organized by planning phases, the year the plans were last approved, the waste reduction/recycling goals and comments concerning future planning.

Table 3.1
Current Status of Solid Waste Plans in Washington

COUNTY PLANNING STATUS BY PHASES (as September 2002)			
COUNTY	**CURRENT STATUS (date last approved)**	**WR/R GOAL**	**COMMENTS**
PHASE I			
King	Yes - 2002	50% residential by 2006 43% non-residential by 2006	Latest plan approved May 10, 2002. Plan calls for targets to be evaluated every 3 years as new data becomes available from waste monitoring studies.
Seattle	Yes - 1999	Recycle or compost: 60% by 2008	
Kitsap	Yes - 2000	Supports the state goal of reaching 50% recycling.	
Pierce	Yes - 1993	50% WRR by 1995	Currently updating plan
Snohomish	Yes - 1990	50% recycling goal to be reached approximately 2008	Latest plan approved July 11, 2001. The recycling potential assessment (RPA) combines two approaches to reaching 50% - a blend of education/ programs and a regulatory approach.
Everett	Yes - 1996	35% recycling by 2005 3% to 5% WR	
Spokane	Yes - 1998	50% Recycling by 2008	
PHASE II			
Clallam	Yes – 2000	20% by 1996 40% long range goal	Implementation
Clark	Yes - 1994	50% WRR by 1995	Currently updating plan
Cowlitz	Yes - 1993	50% WRR by 1995	Probably write an amendment
Grays Harbor	Yes - 2001	50% WRR by 1995	Implementation
Island	Yes - 2000	Assist the State in achieving its goal of 50%	Latest plan approved December 7, 2000.
Jefferson	Yes - 2000	Minimum 29% long range	Implementation
Lewis	Yes - 1993	18% WRR by 1995	Currently updating plan
Mason	Yes - 1998	35% WRR by 1998	Implementation
Pacific	Yes – 2000	32% WRR by 1996	Implementation
San Juan	Yes - 1996	50% by 1995	
Skagit	Yes - 1994	50% or better by 1995	Currently updating the plan with draft expected late 2002/early 2003.
Skamania	Yes - 1992	40% WRR by 1998 50% long range goal	Currently updating plan

COUNTY PLANNING STATUS BY PHASES (as September 2002)			
COUNTY	**CURRENT STATUS (date last approved)**	**WR/R GOAL**	**COMMENTS**
Thurston	Yes - 2001	Increase recycling rate by 2.5% by 2005	Update complete and approved 2001, waiting for City sign-off (issues)
Wahkiakum	Yes - 1994	20% WRR by 1996	
Whatcom	Yes - 1999	50% diversion	
PHASE III			
Adams	Yes - 1993	50% WR/R BY 2012	Currently updating plan
Asotin	Yes - 1998	26% by 1997	
Benton	Yes - 1994	35% by 1995	Currently updating plan
Chelan	Yes - 1995	26% by 1995	Beginning plan update
Columbia	Yes - 1994	20% WR/R by 1996	Currently updating Plan, first draft complete
Douglas	Yes - 2002	25% by 1995	Update complete
Ferry	Yes - 1993	35% WR/R by 1995 50% WR/R by 2013	Preparing to update plan
Franklin	Yes - 1994	35% R by 1995 5% WR by 1998	Currently updating plan
Garfield	Yes - 1993	26% WR/R by 1997	Currently updating Plan, first draft complete
Grant	Yes - 1995	22% WR/R by 2000	Amended plan 1999
Kittitas	Yes - 1999	50% by 2006 (in update)	
Klickitat	Yes - 2000	50% diversion	
Lincoln	Yes - 1992	35% WR/R by 1997	Amended plan 1999
Okanogan	Yes - 1993	30% by 2000	Currently updating plan
Pend Oreille	Yes - 2002	45% WR/R by 2015	
Stevens	Yes - 1994	36% WR/R by 2012	Currently updating plan
Walla Walla	Yes - 1994	40% by 2002	Currently updating plan
Whitman	Yes - 1997	40% WR/R by 2001	Currently updating plan
Yakima	Yes - 1994	35% by 1995	Currently updating plan

Partnering for the Environment through Financial Assistance

Coordinated Prevention Grants (CPG)

Ecology launched the Coordinated Prevention Grant (CPG) Program in 1992. The CPG is a consolidated program of prevention grants distributed to local governments for waste management programs and activities. Most of the local solid and moderate risk waste projects supported by state grants are funded through this Coordinated Prevention Grant Program. Since 1992, local governments have received over $116 million in CPG grants to support their solid and moderate risk waste activities.

The coordinated grant structure encourages local governments to work together to examine their waste management needs and decide the activities they will propose for grant funding. Ecology allocates the available funds for countywide areas, using a base amount for each county plus a per capita amount. Local governments must apply and meet eligibility requirements to receive CPG grants and they must provide a cash match of 25 percent of the total eligible costs of their projects.

This is the first year of the two-year grant cycle, running from January 1, 2002, through December 31, 2003. For this grant cycle, $17,419,902 was awarded to 103 different city, county, and public health jurisdictions. When the match dollars are included, the CPG grants will leverage over $23 million in solid and moderate risk waste projects.

The categories of waste management activities funded by the Coordinated Prevention Grant Program for the current 2002-2003 cycle are identified in Table 3.1.

Table 3.2
Waste Management Activities Funded by CPG Program for 2002-2003

Activity	Total	% of Total
Household Hazardous Waste Collection and Disposal (HWCD)	$5,704,989	33.1%
Waste Reduction and Recycling—Activities (WRRA)	$5,180,233	30%
Solid Waste Enforcement (SWE)	$3,204,546	18.4%
Waste Reduction and Recycling—Capital (WRRC)	$1,115,234	6%
Small Quantity Generator Implementation (SQG)	$1,084,830	6%
Household Hazardous Waste Implementation (HHWI)	$ 780,689	4.5%
Solid Waste Planning (SWP)	$ 177,654	1%
Moderate Risk Waste—Capital (MWRC)	$ 139,214	.08%
Hazardous Waste Planning and Education (HWPE)	$ 32,513	.02%
TOTAL	$17,419,902	100%

CPG Program Revisions Underway

While the 2002-2003 grant cycle marked the introduction of changes brought about by a CPG revision process in the summer of 2000, another CPG revision process began in 2002. This second revision is in response to recent amendments to the CPG enabling legislation, which requires Ecology to adopt certain investment practices in the administration of grant programs.

The legislation was passed after the Joint Legislative Audit Review Committee (JLARC) examined several of Ecology's grant programs in terms of environmental results obtained for the grant dollars invested. The programs have been directed by the legislature to take a new approach in allocating grant funding.

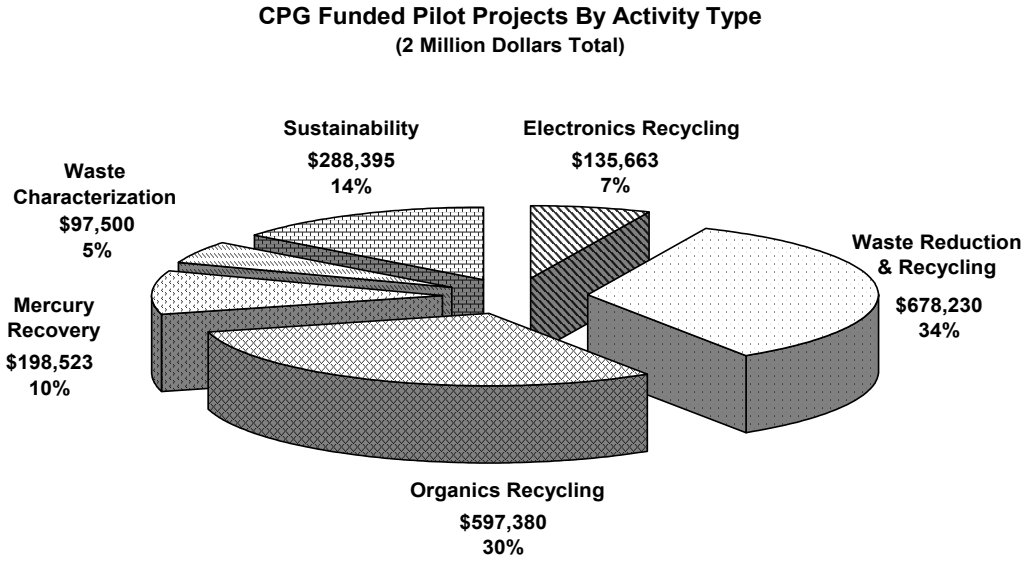
This approach is called Outcome Funding. Outcome Funding uses target plans to connect desired end results, actions taken, and milestones that can better show environmental outcomes for the investment of state grant dollars. As a result, new CPG performance reporting measures are being developed in partnership with local government. Ecology is working to meet both the mandate from the legislature and the needs of local government. Once the revisions are complete, they will be incorporated into the CPG guidelines for the 2004-2005 grant cycle.

CPG Pilot Project Tests Outcome Funding

To test the Outcome Funding investment strategy recommended by JLARC, the Solid Waste and Financial Assistance Program (SW&FAP) offered $2 million in additional CPG funding for pilot grant projects in the winter and spring of 2002. The goal was twofold: to learn more about grants as investments, and to help local governments further implement their solid waste plans. The focus of the pilot projects was on sustainability, defined as waste reduction, pollution prevention, materials reuse, and energy or resource conservation.

After an experimental application process, 30 grants were written to 22 different local governments. A breakdown of the pilot grants according to the focus of the activities is found in Figure 3.1.

Figure 3.1
Amounts Awarded To Pilot Grant Projects During 2002-2003(By Activity Type)



Examples of Pilot funded activities include:

- **Waste Characterization:** Clallam County received $37,500 to study quantities and types of waste generated countywide. The results will be crucial in planning for the transport system necessary after the Port Angeles landfill closes in 2006.

- **Mercury Collection:** Kitsap County received $11,000 to promote a thermometer exchange program that will assist residents wanting to exchange mercury fever thermometers with less toxic alternatives.

- **Organics Management:** In Pierce County, the city of Tacoma received $18,750 to test a new organics composting facility that will combine food and yard wastes from single-family homes, apartment complexes, florists, restaurants and grocery stores.

- **Implementing Sustainability**: In King County, the city of Bellevue is getting $185,000 to implement sustainable building concepts at a local greenbelt ranger station. The city of Seattle will use $89,300 for food-composting and environmental-purchasing studies. King County Solid Waste will receive $89,200 to convert diesel trucks to run on biodiesel fuel derived from waste oil.

- **Electronics Recycling:** In Benton County, the city of Richland is getting $14,000 to sponsor a collection event for televisions, computer monitors, and other electronic waste. Collected materials will be recycled.

- **Waste Reduction and Recycling**: San Juan County will use its grant of $435,985 to construct a reuse and recycling facility in Friday Harbor.

For additional examples of the activities occurring under each of these pilot project categories, or more detailed information about the Coordinated Prevention Grants Program, please contact Steve Loftness, CPG Program Coordinator, at (360) 407-6060 or email at stlo461@ecy.wa.gov.

Grants to Citizens - Public Participation Grants (PPG)
Washington's chapter 170.105D RCW*, Hazardous Waste Cleanup - Model Toxics Control Act*, provides for a Public Participation Grant program. These grants make it easier for people (groups of three or more unrelated individuals or not-for-profit public interest organizations) to be involved in two types of waste grant issues:

- The cleanup of hazardous waste sites.
- Carrying out the state's solid and hazardous waste management priorities.

Public Participation Grant projects motivate people to change their behavior and take action that will improve the environment. These projects create awareness of the causes and the costs of pollution. They provide strategies and methods for solving environmental problems. This highly competitive program applies strict criteria to

applications, awarding grants to projects that prevent pollution and produce measurable benefits to the environment.

The PPG program writes grants for either one year or two years. All Hazardous Substance Release Site grants are automatically written for the biennium (2 years). The Pollution Prevention Education/Technical Assistance grants may be written for one or two years. The most a grant recipient may receive for a one year grant is $60,000; a two year grant recipient may receive up to $120,000.

For the July 1, 2001 through June 30, 2003 grant period, Ecology initially offered 27 groups/organizations Public Participation grants. One grant recipient declined the grant offer due to changes in their organizational focus and another declined due to lack of someone to take leadership for the project. This left 25 entities accepting the grant offers for a total of $903,000 for the biennium. These funds provided sixteen (16) grants for cleanup of hazardous waste sites and nine (9) grants for carrying out solid/hazardous waste pollution prevention education management priorities.

Moving Toward Sustainability:

The Solid Waste & Financial Assistance Program is turning its focus more toward sustainability initiatives, initiatives that are more efficient and effective because they prevent waste rather than manage it. The PPG program has been providing support to projects that are focused toward various levels of Sustainability. The following grants issued in the 2001-2003 biennium provided support to projects that were moving toward sustainability in their community or a specific business/industry.

Toxics Reduction Initiatives

- Puget Soundkeeper Alliance – Initiate and facilitate meetings with Jefferson, Skagit, Island & Clallum counties with the EnviroStars Cooperative to identify needs and/or limitations to participating in the Cooperative's autobody shop waste audits. Also to implement the last phase (year 3) of the pilot project with the Puget Sound Clean Air Agency (PSCAA) and the Autobody Crafters Association (ACA) to reduce the cost of the air permit to autobody shops that have attained the four or five star level.

- WA Toxics Coalition – Provide up-to-date health care information on how to protect the residents of the state and their environment. Their focus is to persuade and enable the residents to use safe or less toxic indoor and outdoor home care products in order to reduce toxic exposures to salmon, wildlife and humans.

Sustainability & Public Education

- Community Services Work Group – Coordinated education/outreach events on waste prevention and energy conservation for Earth Day.

- Lake Roosevelt Forum – Create an arena where diverse interests can come to express their concerns and ideas and build a dialog based on trust and respect for each others' interests and needs. Through this diverse group, common ways to protect and/or preserve the quality of the environment Lake Roosevelt will be developed.

Business Redesign

- Automotive Recyclers of Washington – Seminars to be held on Best Management Practices for hazardous waste and stormwater management for auto wrecking yard site cleanup; also to educate auto recyclers about new regulatory changes and proposed changes including the Mercury Recycling Plan due in December of 2002.

- Washington State Recycling Association – Plan and hold statewide commercial recycling roundtables. The focus is to bring local community businesses and commercial waste haulers and/or recyclers together to discuss opportunities to initiate or increase commercial recycling.

Past Grants Supporting Sustainability:

Although there is an increased focus on sustainability, in the past, Public Participation Grants have also supported Sustainability projects. Below are only a few of the projects funded by past grants.

Toxics Reductions Initiatives

Fremont Neighborhood Council 1992
WA State Pest Control Association 1995
The Green Zone 1999
Clark County Hazardous Waste Citizen Task Force 2001

Sustainability and Public Education

The Latona School United Parents 1993
WA Toxics Coalition 1996
Inland Empire Public Lands Council 1997
Lake Roosevelt Forum 2000

Business Redesign

Washington Citizens for Recycling 1993
Economic Development Association of Skagit Co. 1994
Associated Industries of the Inland Northwest 1995
Cascadia Revolving Fund 1995

CDL/LEED Certification

Sustainable Design Council 1993
Sustainable Building Collaborative 1993
Energy Outreach Center 1997
Resource Efficient Building & Remodeling Council 1999

Partnering for the Environment through Public/Private Cooperation

Many partnerships between government, business, and the community have already been developed to better address these challenges on the local, state, or national level. The Solid Waste and Financial Assistance Program (SW&FAP) remains committed to supporting these existing partnerships. In addition, staff are identifying and helping to create new public/private partnerships to address current solid waste management challenges and to implement sustainability. By pooling resources and talents, these partnerships are identifying creative solutions to current solid waste management problems, converting waste to product, taking advantage of opportunities that might otherwise be lost, and sharing information to help others succeed. Examples of some of the partnerships supported by SW&FAP staff are discussed below.

Cascadia Region Green Building Council
Cascadia Regional Green Building Council is a chapter of the national organization, United States Green Building Council. It is a regional partnership of entities from Oregon, Washington, and British Columbia. Members include the private sector (contractors, architects, vendors, engineering firms, utilities, etc.), local and state government (Ecology, Office of General Administration, Seattle, King County, Portland, Vancouver, B.C.) and not-for-profit organizations. The partnership works together to accomplish the following goals:

- Promote the design, construction, and operation of buildings that are environmentally responsible, profitable, and healthy places to live and work.
- Serve the Cascadia members and their communities through development of industry standards, design practices and tools, policy advocacy, information exchange, and education.
- Encourage widespread acceptance of LEED (Leadership in Energy and Environmental Design) certification as the regional standard for building and communities.

Sustainable Housing Innovation Partnership
SW&FAP staff has been working for two years with Spokane Neighborhood Actions Program (SNAP) to design and build up to 150 low-income housing units for larger families, using sustainable design and construction principles, techniques, and materials.

SNAP's property developers formed an unprecedented partnership of national and local public and private organizations whose roles varied from funding to technical consulting to user feedback. Organizations as diverse as Housing and Urban Development, Avista Utilities, the Northwest EcoBuilding Guild, the Pomegranate Center, and Spokane

County Community Development joined hands with SNAP and Department of Ecology to help make the idea of sustainability built low-income housing a reality in Spokane.

The first 53 units of Riverwalk Point are now under construction. SW&FAP staff helped the SNAP development staff understand sustainable design benefits and costs, select a green building design guideline to follow, screen and select architects and general contractor, and develop a method to document environmental performance of the project once it's constructed.

The public and partners are invited to track the progress of Riverwalk Point through a quarterly newsletter and a Web site: http://ship.snapwa.org. (NOTE: no www, please).

Sustainable Design and Construction Seminar Series
SW&FAP is partnering with Washington State University's Interdisciplinary Design Institute (IDI) at the WSU-Spokane campus to offer a unique two-semester course in sustainable design and construction. A staff member from Ecology's Eastern Regional Office organizes this unique combination of academic coursework and training for working professionals. The course entered its second year as an offering in WSU's catalog in September 2002.

The Seminars in Sustainable Design feature lectures on specific aspects of sustainable design and construction by recognized experts who are for the most part working professionals from throughout the Pacific Northwest. All classes are organized into topical units covering such technical areas as energy systems and the building envelope, indoor air quality, lighting alternatives, water conservation and stormwater management, green building materials, and others.

Most students are upper division architecture, landscape architecture, interior design and construction management students at WSU-Spokane, however, the class sessions are also open to working professionals in design and construction who want to develop their green design and construction skills as part of their professional development.

In 2002, the Seminars are being added to the Washington Higher Education Telecommunications Service (WHETS) system, which allows real-time classroom participation from multiple WSU remote campuses throughout Washington. In 2002, professionals from WSU's environmental services office and physical plant will participate via WHETS from Pullman. Another group of professionals was planning to participate in selected units from WHETS classrooms in the Tri-Cities, and Vancouver, Washington.

This partnership enables Ecology to promote sustainability in design and construction by giving new architects, interior designers, and construction managers the skill-set needed to be effective at advocating for sustainable design and construction practices and executing sustainable design plans.

Students attending a hands-on workshops with alternative building materials like straw

In 2001, 25 students enrolled in at least one semester of the Seminars and eight working professionals enrolled in at least one of the technical units that make up the Seminars. Enrollment of full-time students in fall 2002 was 20 with 13 working professionals planning to participate by WHETS from Pullman and Tri-Cities.

The seminar series also uses a commercially offered Web site (www.sdacteam.intranets.com) to share homework assignments, required and suggested readings, conduct on-line topical forums amongst guest lecturers, faculty, and students, and list important educational events in sustainable design with hyperlinks to more information on course topics.

Cooperative Composting Facility
SW&FAP is partnering with the City of Leavenworth, the City of Cashmere, Chelan County, and Tree Top Inc. to site, permit, finance, and operate a composting facility. By pooling resources and working together, the project will provide specific benefits to the participants and will establish an organics recycling facility in the upper Wenatchee Valley. The facility will:

- Establish a "beneficial use" alternative for City of Leavenworth biosolids.
- Develop an alternative market for fruit pomace produced by Tree Top, Inc.
- Provide a yard waste recycling option for Chelan County and an alternative to burning.
- Augment the City of Cashmere's yard waste collection program and develop a revenue source for its Solid Waste Program.
- Divert organic wastes from landfill.

Xeriscape Demonstration Garden
The mission of the Yakima Area Arboretum is to create and share a living museum of botanical specimens in order to cultivate a greater knowledge and appreciation of trees and plants from around the world in an atmosphere of beauty, relaxation, and inspiration. SW&FAP is partnering with the Arboretum and Yakima County Solid Waste to design and create a xeriscape garden at the Arboretum. SW&FAP staff secured a $4,000 Environmental Protection Agency Region 10 grant to help fund the project and Yakima County Solid Waste is contributing $3,000 from a Pilot Coordinated Prevention Grant.

Construction of the Xeriscape Demonstration Garden

The garden will be part of a series of newly established topic gardens and will be designed to educate Yakima Valley residents on the value of water conservation, use of compost and recycled materials, reduced use of chemicals, and the value and beauty of landscaping with native and xeriscape plants. In addition to being used as a learning center, the Native Plant Society will propagate native plants for sale with the proceeds going to support the arboretum. Volunteers at the arboretum will maintain the garden.

Fort Lewis Sustainability Initiative
Fort Lewis, in Pierce County, has embraced the concepts of sustainability and is now examining how to implement selected goals in certain key areas during the next five years. This effort began with a multiday conference held at the Tacoma Convention Center where various natural resource agencies, health departments, and military personnel met and created a long-term set of strategies and possible goals for Fort Lewis commanders to consider. SW&FAP staff is helping the materials procurement and materials workgroup in examining the systems and planning effective strategies for sustainability for the coming five-year period.

National Paint Dialogue

The Northwest Product Stewardship Council (NPSC) is a group of government agencies working with businesses and nonprofit organizations to integrate product stewardship principles into the policy and economic structures of the Pacific Northwest. The Northwest Product Stewardship Council and the Product Stewardship Institute (http://www.productstewardshipinstitute.org/), on the national level, are working on product stewardship initiatives for several priority waste streams, one of these being old paint. There are industrial, consumer, and energy markets for old paint, and at the local level, costs are significant for management of those same materials. Consequently, local communities are striving to find ways to move the management of old paint toward these markets as well as encourage the paint industry to become more actively involved in waste avoidance and end-of-life management. It is a push toward more sustainable practices for old paint. SW&FAP staff represent the interests of Washington and providing an active liaison function for the Northwest Product Stewardship Council by serving as a member of the national dialogue on paint sponsored by the Product Stewardship Institute.

Partnering for the Environment by Beneficial Use of Wastes

Biosolids

In the spring of 1998, Ecology issued a new rule, chapter 173-308 WAC*, Biosolids Management*, and a new statewide *General Permit for Biosolids Management*. In the past four years staff have been focusing on three workload areas:

- State program delegation to local health departments
- Permit program implementation
- Technical assistance

Local Delegation

By late 2002, eleven health jurisdictions had accepted some degree of delegation and were actively partnering with Ecology towards implementation of the state biosolids program. Other health jurisdictions are also working with Ecology but have not authorized a formal delegation arrangement. Local funding and workload issues have been barriers to delegation. An unanticipated barrier has been continued concern regarding implementation of the septage management portion of the state program. Ecology is convening an advisory committee to evaluate the current septage management elements of the state biosolids program and make recommendations for improvements. A resolution of those concerns may encourage further delegation at the local level. At the same time, budgets continue to tighten and are expected to be an on-going barrier to delegation efforts.

Permit Program

Ecology estimates there are about 375 Treatment Works Treating Domestic Sewage (TWTDS) statewide (these are the facilities which are subject to permitting under the state biosolids program). This number includes federal and state facilities, as well as Beneficial Use Facilities, composting facilities, and some septage management facilities. Most TWTDS, however, are publicly owned treatment works (municipal sewage treatment plants). All facilities are obligated to comply with any applicable requirements of the state rule, *regardless of their status under the permit system.*

Treatment works come under the biosolids permit system in two phases. The first phase, called "provisional approval," obligates a facility to comply with all applicable requirements of the statewide general permit. The second phase – final approval – is the process whereby facility specific requirements beyond those required under the rule or basic general permit are developed and put in place. This process is necessarily slower due to the complexity of reviewing individual permit applications with limited staff resources.

Virtually all facilities are now under provisional approval, and about forty final approvals of coverage under the statewide permit have been granted as of October 2002. Permitting of septage land application sites and beneficial use facilities has consumed a disproportionate amount of staff time. Resolution of difficulties encountered in permitting these types of facilities would speed the overall permit issuance process.

Septage Management

The 2002 Legislature approved a supplemental budget request for SW&FAP to pursue an assessment and potential revisions to the current septage management elements of the state biosolids program. A fifteen person inter-agency advisory committee has been assembled, including representatives from the regulated community. The committee held its first meeting in September 2002. The committee will identify goals, evaluate options and recommend a course(s) of action. Final recommendations are due by June 30, 2003. Resources permitting, the agency may begin work on the recommended actions.

Composting

Composting continues to be a key element of the state's strategy of reaching statewide 50 percent recycling goal. Thirty-five compost facilities actively recycled organic material in Washington in 2002. Collectively they transformed over a million cubic yards of organic waste, which included (in order of quantity recycled): yard debris, miscellaneous material including food waste, wood waste and sawdust, manure, and biosolids. From this organic waste material approximately 600,000 cubic yards of finished compost were produced and sold. (This quantity includes updated information from a telephone survey in November 2002.)

Since 1985, compost facilities have been primarily permitted under the *Minimum Functional Standards for Solid Waste Handling*, chapter 173-304 WAC. Two guidance documents have helped clarify the requirements for composting and compost quality over the past several years (Compost Facility Resource Handbook, #97-502; Interim Guidelines for Compost Quality, #94-38.) Ecology has incorporated many of the facility designs and operating standards from the compost facility handbook into the revised rule chapter 173-350 WAC, *Solid Waste Handling Standards*. The new rule has a section that deals specifically with compost facilities and should provide increased clarity and consistency for permitting. In addition, the new section includes compost quality criteria. Finished product must meet the criteria in order to be considered "composted material," and no longer subject to solid waste handling requirements. The rule should be in place in early 2003. (See Chapter 1 for more information on the new solid waste rule.)

The Solid Waste and Financial Assistance Program (SW&FAP) continues to support composting and compost use through a number of collaborative activities: training compost facility operators promoting compost use for erosion control and stormwater management, and meeting the challenges of herbicide contamination in compost.

Compost Facility Operator Training

SW&FAP views training as an essential component of a successful composting industry. Staff have been involved in administering a well-received workshop offered by the Washington Organic Recycling Council (WORC) for the past several years. In 2001 and 2002, WORC revised the 5-day curriculum to focus on the biology of composting, reinforced with hands-on field activities. The new format has received enthusiastic reviews by workshop participants. It helps to strengthen the composting industry by focusing attention on the underlying reasons for both regulatory and market-driven requirements.

Erosion Control and Stormwater Management

SW&FAP recognizes the potential for compost and organic mulches to reduce soil erosion and protect water quality. Use of compost in roadside improvements has steadily increased over the past several years. In September 2002, the Washington State Department of Transportation reported using 20 percent of all compost produced in the state from permitted compost facilities. SW&FAP anticipates future collaboration to document the benefits of compost used in erosion control blankets and filter berms.

Ecology continues to promote the concepts of the "Soil for Salmon" initiative, a program started by WORC in 1999. "Soils for Salmon" gained national recognition as an education program for raising public awareness about the link between soil quality in developed landscapes, water quality, and salmon recovery. In keeping with the soil quality/water quality link, Ecology incorporated voluntary BMPs into the Stormwater Management Manual for Western Washington. The BMPs call for preserving native soils as the best strategy for protecting site hydrology and preventing negative impacts to stormwater. Where soils must be disturbed during development, the BMPs call for increasing organic matter to a depth of 12 inches in order to improve infiltration and water holding capacities of the soil.

Clopyralid

The herbicide ingredient, Clopyralid, has been a significant issue affecting compost in Washington for almost three years. Ecology is working with the Washington State Department of Agriculture (WSDA) and several stakeholder groups to develop a strategy for keeping Clopyralid out of composting feedstocks.

Manufactured by DOW AgroSciences, Clopyralid is marked in a number of formulations designed to kill broadleaf weeds such as clover, thistle, and dandelion. Clopyralid (clo-peer-ra-lid) persists through the composting process and has been shown to damage sensitive plants at concentrations as low as one to three parts per billion in finished compost.

Concerns about the herbicide first appeared in eastern Washington in 2000, when growers in Spokane and Pullman experienced crop damage that was later traced to Clopyralid. WSDA investigated the herbicide complaints, finding high use rates of Clopyralid on lawns in the Spokane area. Although grass clippings are not the only composting feedstock likely to contain Clopyralid, yard debris appeared to carry the highest potential for negative impacts to the state's successful recycling systems. In response, WSDA convened a technical advisory committee in the Fall 2001. WSDA issued an emergency rule on March 1, 2002, prohibiting use of Clopyralid-containing herbicides on all lawns and turf in Washington State, except golf courses. The emergency rule was followed by a permanent rule which became effective on June 28, 2002.

Ecology continues to work with WSDA, research institutes, composters, local governments and consultants to formalize a low-cost bioassay to identify herbicide damage in susceptible plants grown in compost-amended soil. Research will continue to evaluate the effectiveness of the state rule prohibiting use of Clopyralid on lawns and turf. Unfortunately, the Spokane Regional Compost Facility stopped processing yard debris early in 2002, as a result of the Clopyralid issue.

Although the problems with herbicide contamination have not been completely solved, composting in Washington State is a successful industry. Organic materials comprise over half the solid waste generated in Washington and the recycling of these materials are key to reducing the volume of material placed in landfills. Compost provides a variety of benefits including the improvement of soil, water conservation, reduction of erosion and the need for fertilizers and pesticides. Due to the collaborative efforts of government, private industry, and researchers, composting has taken progressive, positive steps in dealing with adversity while encouraging continued recycling and beneficial use of organic waste streams in Washington.

Partnering for the Environment by Focusing on Specific Problem Waste Streams

Effective and proper management of Washington's solid and moderate risk waste streams, and biosolids including programs designed to reduce, reuse, beneficially use and recycle many of those wastes, relies on the coordinated efforts of local, state, and federal governments in conjunction with private businesses and the general public.

Past efforts of the Solid Waste & Financial Assistance Program (SW&FAP) have focused on the organic waste streams and the construction and demolition waste stream. The focus is now shifting to other specific waste streams including electronic waste, old paint, tires, and persistent bioaccumulative toxins (PBTs) mercury and certain pesticides.

Electronic waste

Electronic waste refers to unwanted computers and peripherals, TVs, VCRs, and other devices that are common consumer items for business and personal use. Technological innovation currently requires upgrades on an average of every 18 months, a pace which continues to accelerate. It is estimated that there are about 315 to 680 million obsolete computers in the United States today.[1] However, a large percentage of these units have not entered the solid waste system—yet. Each consumer household is estimated to have two to three unwanted computers stockpiled in its basement, garage, or storage unit.[2] As technology saturates the market through inventions such as high definition television (HDTV), the number of obsolete units per household will increase. Experts predict that a consumer threshold is readily approaching and people will want to dispose of their old electronic products to make room for new ones.

The solid waste system is now faced with a massive new electronic waste stream which contains dangerous heavy metals, such as lead, mercury, or cadmium. The plastics used in computers and TVs contain brominated flame-retardants, polyvinyl chloride (PVC), and (in older capacitors and transformers) polychlorinated biphenyls (PCBs). Cathode ray tubes (CRTs) found in standard computer and TV monitors are one of the more problematic elements of these units due to the amount of lead used in the units. If these toxic components were to be disposed of in a landfill, there would be little guarantee the landfill could contain these chemicals and metals over its lifetime. At less stringently operated landfills or incinerators, environmental problems may be much worse. For instance, burning halogenated flame retardant products found in computers releases dioxins and furans. Massachusetts recently banned all electronic waste from their disposal system to prevent incineration of these items.

[1] Silicon Valley Toxics Coalition. 2002 "Poison PCs and Toxic TVs: California's biggest environmental crisis that you've never heard of." P. 2
[2] Ibid.

Washington State regulation deems computers containing CRTs as dangerous waste under *the Dangerous Waste Regulations*, chapter 173-303 WAC. In light of the perceived logistical burdens which would ensue from this designation, Ecology developed an interim enforcement policy for conditional exclusion of CRTs. (See http://www.ecy.wa.gov/pubs/0204017.pdf for the full document.) The policy excludes monitors containing CRTs from dangerous waste rules *if* recycled by a legitimate recycler. Individuals are not required (at the state level) to recycle their personal monitors. Due to the impacts on the Solid Waste and Financial Assistance Program (SW&FAP) and the Hazardous Waste and Toxics Reduction Program, staff from both programs are collaborating to implement this policy.

It is important to note that state regulation is not the only level of regulation applied to CRTs. County governments may have different requirements for handling materials classified as "universal waste." Due to stricter regulation of universal waste, some counties are facing a total landfill ban in their county. While a landfill ban may seem like the best environmental policy, local governments may not have enough (or any) alternatives in place for their constituents, such as accessible recycling facilities or collection sites. This could lead to a dramatic increase in the rates of illegal dumping or could result in residents taking computers to neighboring counties (or states) without complete landfill bans. However, it violates federal RCRA rules to dispose of commercial waste that designates as a hazardous waste into typical solid waste landfills.

The interim enforcement policy aims to encourage recycling rather than disposal. However, electronics recycling is not the sole answer to this complex problem. In the recent past, much of the e-waste "recycled" has been sent to Asian countries for disassembly and recovery of the valuable materials. Few, if any, environmental or labor protections exist for these recycling operations. If this practice continues, the toxic legacy of electronics products will be merely displaced from U.S. soil to communities abroad. The interim enforcement policy requires companies that export CRTs to document the shipment and use a legitimate recycler.

One of the primary reasons these computers are exported to other countries is that few domestic recyclers exist for certain components of electronic products. Additionally, computers are not designed for easy or safe recycling, reuse, or disassembly. Many products are so expensive to upgrade or repair that it is easier to purchase a brand new unit. Alternative products, such as LCD monitors, have been proposed as a possible solution to CRTs, but their environmental impact may be as large as CRTs.

Another consideration in handling the electronic waste stream is that cost is a significant barrier for efforts to safely reuse, recycle, and collect electronic waste. As an example, the typical recycling cost for an obsolete monitor is approximately $20-$30 (depending on staff and transportation costs). In order to collect and recycle 10,000 computers, it would cost $200,000-$300,000. Municipalities are not prepared to bear these costs exclusively.

Information on the volume of electronic devices is also limited and this impedes planning efforts for governments. Since it is estimated that a large percentage of unwanted electronics are simply being stored, traditional waste composition studies cannot accurately account for the volume of this waste. Ecology can play an important role in acquiring needed data to anticipate the volume of electronic waste. Ecology can also assist with sharing information and appropriate strategies that will help to coordinate efforts between governments as they prepare to handle this waste stream.

The Solid Waste and Financial Assistance Program (SW&FAP) is working with the Hazardous Waste and Toxics Reduction Program to assess electronic waste issues in Eastern Washington. Data will be compiled and analyzed by December 31, 2002. Questions being addressed through surveys of both the public and private sectors include:

1. How much e-waste exists and will be generated in the future?
2. What existing facilities handle e-waste?
3. Can the current and projected wastes be collected and handled, given the existing infrastructure? If not, what new services or facilities are needed?
4. Can these wastes be processed and reused in an environmentally sound and sustainable manner?
5. What next steps should Ecology and other northwest jurisdictions take to manage these wastes? What opportunities exist for development of local small business?

SW&FAP staff are working with solid waste directors in Douglas and Kittitas Counties to assess how much electronic waste exists in both businesses and residences. A questionnaire will be sent out to businesses and handed out at local grocery stores addressing how many computers/televisions are being stored in both homes and businesses and the cost people will be willing to pay associated with recycling. Data will be compiled and analyzed by March 2003.

While electronics collection events are becoming commonplace, they may simply perpetuate the assumption that someone will take care of dangerous electronic waste when the product is no longer wanted. A more sustainable strategy is to assess the full cost of the computer from cradle to grave and look farther "upstream" to avoid expensive and dangerous disposal costs. Multiple environmental, health, and energy costs also exist throughout the product's life cycle. Typically, many of these costs are paid without reference to producer or consumer responsibility. A "product stewardship" approach advocates that the costs of electronic products should be fully accounted for, understood by, and appropriately assigned to the creators and manufacturers of their design. Additionally, the consumers of these products need to understand (through incentives and economic barriers) the costs of their consumer choices.

A product stewardship model requires the participation of government, consumers, tax payers, and industry groups. Currently, Ecology, along with other local government representatives, is participating in a national set of negotiations that will attempt to provide a product stewardship solution to electronic waste. The negotiations, called the

National Electronics Product Stewardship Initiative (NEPSI), will help state and local governments nationally coordinate their programs to safely collect, reuse, and recycle electronic waste with an appropriate funding mechanism. However, the increasing difficulties at the NEPSI negotiations may require local legislation if a final decision is not reached.

For more information on product stewardship, please see http://www.productstewardship.net/productsElectronics.html.

Tires - A Growing Waste Management Problem

Washington state is working to address our growing scrap tire problem. This is depicted in the recent passage of House Bill 2308 in 2002 (http://www.leg.wa.gov/pub/billinfo/2001-02/House/2300-2324/2308-s_sl_04082002.txt). One section of the act created by this bill directs Ecology to investigate and draw conclusions on the following by December 31, 2002:

(1) The use of scrap tires as alternative daily cover for landfills.
(2) The feasibility of establishing and maintaining an incentive program for market development for scrap tires.

Another section of this act directs Ecology, in conjunction with the appropriate private sector stakeholders, to track and report annually to the legislature the total increase or reduction of tire recycling or reuse rates in the state for each calendar year.

Scrap tires have been problematic for this state before. In fact, during the early 1990s, Washington was heavily focused on cleanup of tire piles. This effort was funded by the Vehicle Tire Recycling Account (VTRA), which was created in 1989 and supported by monies collected from a one dollar per tire fee on the retail sale of new replacement vehicle tires. While the VTRA did sunset in 1994, this account ultimately cleaned up more than 8 million tires in 27 large illegal tire piles throughout Washington. Specifically, the cleanup effort included ten tire piles in Pierce County, seven tire piles in Thurston County, three tire piles in Spokane County, two piles in Clark County, and one each in Lewis, Kittitas, Stevens, Asotin, and Yakima counties.

Ecology estimates that approximately 5.5 million scrap tires, or 75,000 tons, were generated in Washington in 2001. This large volume is beginning to overwhelm Washington's scrap tire management system despite tire collector, seller, hauler, processor, storage, and disposal regulations. Thus, just a few years after the last VTRA monies were spent on tire pile cleanup, scrap tires are once more a growing problem in Washington State. Illegal piles are cropping up again in Washington and with them come the characteristic associated hazards of mosquito and rodent refuge, as well as fire susceptibility from arson, lightning strikes, and spontaneous combustion. Illegal tire piles are not managed to be fire resistant. According the United States Fire Administration's Special Report 93, titled "Scrap and Shredded Tire Fires," published in 1998:

> *"Tires burn with a higher per-pound heat output than most coal, and the high heat production of tire rubber makes extinguishment difficult. Tire pile fires yield large amounts of oil that is both flammable and a threat to the environment. Such fires become hazardous materials incidents that may affect entire communities, often requiring neighborhood evacuations, protracted fire operations, and causing contamination of the air, waterways, and water table." (Page 5)*
> *http://www.usfa.fema.gov/downloads/pdf/publications/tr-093.pdf*

The scrap tire problem in Washington may be due largely to the fact that new markets and economically viable recycling/reuse technologies which use this commodity have been slow to emerge in our state. This slow emergence, in turn, may be due to general misconceptions regarding the magnitude of the scrap tire problem. Additionally, from a leadership perspective, state and local governments may not have been able to focus on scrap tire matters due to other pressing issues.

End-of-life management has been the traditional approach taken with tire products. This means that the primary focus is on what use, if any, will the tire be put to once it is initially removed from its manufacturer's intended use. The tire could be: retreaded and put back to the manufacturer's intended use; reused in its current condition for another purpose; dismantled in some way and put to another use; incinerated for energy production; stored for future reuse or recycling; or the tire could simply be disposed of. Some of these options lead to more complete employment of the valuable resources required to produce the tire in the first place. Other options lead to loss of these resources all together.

Scientists, entrepreneurs, and government agencies have done much research and development in the scrap tire recycling/reuse arena. A few of the many innovative "downstream" uses for scrap tires that have been identified and recently employed in the United States include:

- Scrap tire bales used as a road subgrade.
- Playground rubber safety surfacing made from recycled tires.
- Landfill leachate collection systems made from three- to six-inch tire shreds.
- Tire chips as a replacement for stone in septic system leach fields.
- Crumb rubber for playground surface.
- Crumb rubber top dressing applied to turf in high foot-traffic areas.
- Rubber modified asphalt.
- Tire chips used in street repair.

(**Note**: See articles on the above topics at http://www.scraptirenews.com/archive.html.)

While this downstream management of tires is quite necessary, focusing on this management strategy alone does little to address upstream impacts to air, water, and land from the manufacture and use of tires. Additionally, downstream management of tires can be costly and unfairly burdensome on tax payers. To head off the tire problem we must address all life cycle impacts of tires and involve the organizations that have the most ability to effect change: tire manufacturers.

Some government agencies are looking at product stewardship as a management tool to focus on life cycle product impacts. The United States Environmental Protection Agency (EPA) is one such agency (http://www.epa.gov/epr/index.htm). Product stewardship is a term used to describe a product-centered approach to environmental protection. It calls on all participants in the product life cycle—designers, manufacturers, retailers, consumers, waste managers, and disposers—to share responsibility for reducing the environmental impacts of products. These participants can undertake a number of initiatives which will help to decrease life cycle impacts of tires. Some examples include:

- Designing new tires to have greater life expectancy and durability.
- Manufacturing of retread tires.
- Use of recycled content in production of new tires.
- Passing legislation designed to support the incorporation of the principles of product stewardship in a tire's life cycle.
- Purchasing tires manufactured to decrease life cycle impacts.

Many companies, organizations, and individuals have already begun to research and incorporate some of these life cycle focused initiatives. The EPA has identified examples of such initiatives put forth by all levels of stakeholders (these can be viewed at http://www.epa.gov/epr/products/tires.html). SW&FAP, too, is focusing on life cycle management of tires through fulfillment of legislative directives, research and technical assistance, and continued support of the Northwest Product Stewardship Council (http://www.productstewardship.net/productsTires.html). The legislative report can be found at www.ecy.wa.gov/programs/swfa/index.html.

PBTs: Mercury and Certain Pesticides

Persistent bioaccumulative toxins (PBTs) are emerging as an important issue across the state. PBTs are toxic substances that build up to harmful levels in tissues of organisms and do not break down easily in the environment. Bioaccumulation is the increase in concentration of chemicals/toxins in organisms, and is the result of the organism's inability to metabolize a chemical/toxin as fast as it is absorbed. Human exposure to PBTs can result in adverse impacts to the nervous system and the reproductive system, as well as causing cancer and a range of developmental and genetic problems.

Known PBTs include mercury, lead, polychlorinated biphenyls (PCBs), dioxin, furan, and some pesticides. PBTs such as mercury and some pesticides can be released to the environment through spills or improper disposal. Further, mercury disposed in landfills often is transformed into a gaseous form that escapes. State and local governments have recognized the risks associated with PBTs, and are taking steps to reduce improper use and disposal of these substances. Ecology's PBT Initiative has selected mercury as the state priority PBT. A chemical action plan for mercury has been drafted, and can be found at www.ecy.wa.gov/programs/eap/pbt/pbtfaq.html. Ecology is also participating in a mercury advisory committee with local governments, businesses, citizen groups, and other interest groups.

In June 2002, local governments working with household hazardous waste and conditionally exempt small quantity generator waste (HHW/CESQG, in Washington known collectively as moderate risk waste) met for the Pacific Northwest HHW/CESQG Strategy Meeting to identify regional priorities. Mercury and pesticides were identified as focus areas for the region. As a result, several groups established during this meeting have started working on coordinated efforts to deal with these PBTs and to educate the public about the potential impacts of mercury and certain pesticides. Many local governments have already begun these efforts, which include education programs and collection of mercury thermometers from residents, many of them funded through Coordinated Prevention Grants. While mercury can be recycled, the removal of mercury from many products will result in the need for a disposal solution. Some state and local governments are considering a product stewardship approach to address the problems associated with PBTs. With product stewardship, all groups and individuals, from the manufacturer to the consumer, that benefit from the use of the PBT would be responsible for making sure it is managed and disposed of correctly.

As this issue continues to emerge in the state, each organization should be aware that they are not alone in their efforts. Coordinating with other jurisdictions and other states will lead to a more effective program for the elimination of this threat to human health and the environment. Those interested in joining this important discussion are encouraged to visit the new Pacific Northwest discussion forums on mercury and pesticides located on the North American Hazardous Materials Management Association website (www.nahmma.org). These forums are being actively supported by the Northwest Product Stewardship Council. Ecology is also sponsoring a list serve for professionals dealing with HHW/CESQG (http://listserv.wa.gov/archives/hhw-cesqg.html).

Old Paint

Old paint is collected from residents in every county by local moderate risk waste (MRW) programs, many funded by Coordinated Prevention Grants. The combination of latex and oil-based paints from households is the largest category of waste collected at household hazardous waste collection events and fixed facilities. In the year 2000, over 3.3 million pounds of old paint was collected from households. Only used oil, from the used oil collection system plus HHW collections and facilities, contributes more to MRW amounts, at 10.5 million pounds in 2000. The paint collected was about 65 percent oil-based and 45 percent latex based. It is expected that latex will become a larger proportion of the MRW waste stream as it represents the majority of paints currently sold.

In 2000, approximately eight percent of all Washington households participated in HHW collection activities, each bringing in approximately 66 pounds of HHW. Total quantities of MRW are conservatively projected to increase 69 percent by 2015 from 1999 levels (http://www.ecy.wa.gov/pubs/0007041.pdf). Based on 1999 cost information, the cost per participant can be assumed to be in the range of $40 to $65. The OFM estimate of households (http://www.ofm.wa.gov/poptrends/poptrends01.pdf) in Washington as of April 2001 is 2,490,000. If we combine this number of households with the recent eight

percent participation rate and a cost of $50 per household, the total HHW collection and disposal cost to local and state government can be estimated at about $10 million for the year 2001. If this cost is increased by anywhere near the 69 percent estimate volume increase for MRW from 1999 to the year 2015, there is a looming financial problem associated with continuing HHW collection using the current paradigm.

The used oil from households is relatively inexpensive to manage compared to paint. The majority of latex paint is recyclable as it in received at HHW collection points. Some communities such as Pacific County, Yakima County, and Seattle are among those actively recycling latex paint. There are significant added costs of equipment, building, and labor costs to recycle latex paint. Clark and Cowlitz Counties send their latex paints to Portland where it is processed at a dedicated one-of-a-kind latex recycling building.

Because of the large volume and cost of managing old paint, some local programs have discouraged households from bringing it into HHW collection sites. Ultimately, most paint can be recycled or used as a feedstock for industrial products or used as an alternative fuel. A minority of it requires solidification for landfill disposal. There are industrial, consumer, and energy markets for old paint, and at the local level costs are significant for management of those same materials. Consequently, local communities are striving to find ways to move the management of old paint toward these markets as well as encourage the paint industry to become more actively involved in waste avoidance and end-of-life management. It is a push toward more sustainable practices for old paint. This is being done regionally through the Northwest Product Stewardship Council (http://www.govlink.org/nwpsc/) as well as through the national organization, Product Stewardship Institute (http://www.productstewardshipinstitute.org/) in which staff of SW&FAP and other Ecology staff participate.

Moderate Risk Waste

In early June 2002, local and state government staff met to discuss what strategic direction MRW programs should be taking. Since most programs are about a decade old, it was time to examine what has happened and, more importantly, to map out the best next steps and areas on which to focus attention. Because waste does not respect political boundaries, the conference included state and local representatives from Oregon and Idaho as well as the occasional Montana and British Columbia representative. It was organized by local state officials in collaboration with the North American Hazardous Materials Management Association (NAHMMA).

The strategic meeting was professionally facilitated and evaluations gave the event high marks in every category. Staff from SW&FAP moderated some of the workgroups. Results from the 50 participants included:

- Formation of issue specific workgroups on the following topics hosted on the NAHMMA website (http://www.nahmma.org/cgi-bin/ubbdiscuss/forumdisplay.cgi):

- Creation of a new regional HHW-CESQG professionals list serve sponsored by Ecology at http://listserv.wa.gov/archives/hhw-cesqg.html.

- Clear direction from the group to continue holding annual HHW/CESQG meetings to include presentations, training opportunities, and workgroups.

On many issues discussed at the strategic meeting a clear connection was made to the Northwest Product Stewardship Council (http://www.govlink.org/nwpsc/) and ties were strengthened with that group through the meeting and subsequent workgroup activities.

(See Chapter VII Moderate Risk Waste Management for a summary of 2001 MRW collection programs.)

Partnering for the Environment through Education and Information Sharing

The Closed-Loop Scoop Newsletter
The Solid Waste and Financial Assistance Program (SW&FAP) combined its four regional newsletters into one statewide quarterly newsletter with the debut of *The Closed-LoopScoop* in January 2001. The newsletter provides a mechanism to relay important information to public works departments, health districts, private recyclers and other clients and stakeholders. All SW&FAP staff and local government personnel are encouraged to contribute articles to help readers stay current on legislative matters, share program successes and ideas, and announce upcoming meetings. The newsletter is sent to over 800 individuals and organizations across the state; those parties with e-mail addresses receive their copy electronically. *The Closed-Loop Scoop* can also be found on the Ecology SW&FAP Homepage, http://www.ecy.wa.gov/programs/swfa/index.html.

Terry Husseman Sustainability in Public Schools Awards Program
The Terry Husseman Outstanding Waste Reduction and Recycling in Public Schools Awards Program was on hiatus this past year. During this time, SW&FAP staff reviewed and revised the program so that it focuses more on Sustainability. Ecology realizes that one of the most critical issues that will face the children we teach will be the quality of the world they inherit. A school that both teaches and practices environmentally sustainable behavior will offer children and the local community important role models.

In practice, however, other education priorities have made it very difficult for teachers and schools to take on these responsibilities. Sometimes there may only be one teacher willing to take on the extra tasks and responsibilities. Without further support these teachers often find the process a losing battle. Teaching sustainability principles need not be a separate course. In fact, it might work better if they were treated as overriding principles incorporated into all studies.

Over the next several years, SW&FAP intends to reward schools that embrace these principles through the "Terry Husseman Sustainability in Public School Awards Program." This award program replaces the 14-year old Terry Husseman Outstanding Waste Reduction and Recycling in Public Schools Award program.

A sustainable school program would have elements including, but not limited to, the following five areas:

1. Resource/Energy Conservation
2. Biological Diversity
3. Waste & Toxicity Reduction
4. Social Harmony
5. Health & Wellness

There are three categories of awards:

1. **Seed Award**
   This award is to encourage schools to take steps necessary to embrace the five areas of sustainability, and to assist schools with costs involved in initial start-up of basic sustainability programs or improvements of programs or projects that move them closer to sustainability.

2. **Sustainable School Award**
   This award recognizes schools that are implementing elements of the five areas.

3. **Creative Environmental Curriculum Award**
   This award recognizes curriculum that:
   - Introduces students, teachers, staff, and administrators to the concepts of sustainability including its social, economic, and environmental relevance; and/or
   - Strives to instill sense of environmental stewardship in the students through curriculum.

SW&FAP also has staff across the state prepared to assist schools with their sustainability principles and waste reduction and recycling programs. Staff can help schools perform waste audits and find the resources to develop school or district-wide sustainability programs.

The award cycle begins with the start of the 2002-2003 school year. Announcements will be sent in October and December 2002, applications will be due in February 2003, the judging and selection will occur in March, with notification of the chosen applicants April and an award ceremony held May 2003.

(For more information on the Sustainability in Public Schools Awards program, Contact Michelle Payne at(360) 407-6129 or email: mdav461@ecy.wa.gov or check for updates on the Awards web site http://www.ecy.wa.gov/programs/swfa /terryhusseman.html)

Recycling Information Line

The Solid Waste & Financial Assistance Program (SW&FAP) operates 1-800-RECYCLE to help citizens find ways to reduce waste and recycle. In 2001, over 10,000 callers were assisted. While many callers simply want to know where and how to recycle common items (those taken by recycling centers and local curbside programs), others have

questions of a more complex nature. The information line can suggest alternatives to hazardous household products, and direct callers to locations for the safe disposal of household hazardous waste. Information on used oil recycling and used oil haulers is provided, along with information on locations for the recycling of construction, demolition and landclearing debris. Referrals are made to companies that offer commercial pickup for business recycling. Targeted waste streams, such as electronic scrap, continue to offer the information line increased opportunities.

While many local governments operate information lines within their own areas, the statewide information line continues to serve as a first contact for many. Ecology's statewide information line can also provide callers with information on specialized recycling opportunities beyond their own city or county.

A database is maintained by periodically contacting all recyclers to determine commodities accepted, fees if any, and hours. The database has recently been expanded to include recyclable electronic items, and also lists vendors of products made from recycled construction waste. Links to local government and recycling company Web sites are now listed. Basic household recycling information from the database can be found at the information line's own Web site: http://1800recycle.wa.gov.

Other specific databases on the SW&FAP homepage provide information on using recycled content building materials and sustainable building materials (http://www.ecy.wa.gov/programs/swfa/cdl/index.html) and information about solid waste facilities and disposal data http://www.ecy.wa.gov/programs/swfa/solidwastedata/ .

The 1-800-RECYCLE Web site also includes a Web page developed for kids of all ages. "Fun with Recycling" has neat links to other environmental education sites and fun environmental games to play. It also has interesting trivia facts on different recyclable materials. Check it out at http://1800recycle.wa.gov/kids/index.htm.

Washington State Recycling Association (WSRA)
WSRA is a trade association whose goal is to provide leadership and education to foster the expansion, diversity, and economic vitality of recycling as part of integrated resource management. SW&FAP is a GOLD sponsoring member and supports WSRA through representation on its board of directors. Benefits and services of this organization include networking opportunities, a bimonthly newsletter, annual conference and trade show, and workshops. The education committee developed a series of four fact sheets that connect recycling to current issues such as the economy, energy, fuel and water. These "Hot Topics" fact sheets were developed as tools for recycling educators and can be viewed at http://www.wsra.net/b4_hottopics.asp.

Operator Certification Program
In Washington state, solid waste landfills and incinerators are required to have certified operators on site at all times, per chapter 70.95D RCW*, Solid Waste Incinerator and Landfill Operators*. The Landfill and Incinerator Operator Certification program was created by the legislature in 1989, through the "Waste Not Washington Act". The

implementation rule was adopted in June 1991, chapter 173-300 WAC*, Certification of Operators of Solid Waste Incinerators and Landfill Facilities*.

The requirements for having certified operators on site at all times apply to the following types of facilities: municipal solid waste landfills; inert and demolition landfills; limited and special purpose landfills; and all incinerators that burn solid waste. The law also requires that any person inspecting an applicable solid waste facility must be certified.

Course offerings began in 1992, with those taking the course and passing the test receiving certifications of competency for 3 years. Yearly training courses were held on landfill and incinerator operations until 1995. Direct funding for implementing this program in SW&FAP is not available. Because of reduced staffing, a home study course was instituted. This not only reduced the level of effort for SW&FAP, it provided a cost savings to those who took the course. The certification training however no longer focuses on Washington specific issues for both operators and inspectors. SW&FAP is currently evaluating the operator certification program to determine if there is a better way to implement the program.

Over 1,000 persons have taken one or both courses since the programs inception. To date, a total of 547 people have been certified for landfill operations and 380 have been certified for incinerator operations. Certification renewals began in 1994.

In 2002, 69 certificates were up for renewal (50 landfill and 19 incinerator). Notices were sent out in September. Re-certification requests must be submitted to Ecology by years' end.

There continues to be a significant decrease in the number of persons taking the landfill course since 1995. The reduction in the number of certified landfill operators can be attributed to a reduction in the number of landfills since the program began. The number of persons taking the incinerator course has stayed fairly stable.

Ecology Walks Its Talk

In 1999, Ecology formed an internal Waste Reduction and Recycling Committee. SW&FAP staff are actively involved with this committee. The mission of the committee is "To communicate goals and educate staff and managers so that all Ecology building tenants adopt resource conservation and recycling practices aligned with sustainability principles—especially as they relate to the materials we use, to the waste we generate, and to reducing our environmental impacts at work." To accomplish this mission the committee developed a work plan called the Model Waste Reduction and Recycling Plan. This document was developed as a tool to help guide our sustainability efforts, especially as they pertain to Ecology's waste reduction and recycling (WRR) practices. It includes a brief description of previous waste reduction and recycling efforts at Ecology.

The committee's focus over the past year was the development of an Environmentally Preferable Purchasing Policy (Ecology Policy 8-19) and guidelines. The purpose of the policy is to eliminate the waste of resources by reusing goods and to increase the percentage of purchases of environmentally preferable products. It says that Ecology will consider the environmentally preferable option when it meets performance and price needs, gives the purchasing office authority to direct purchase decisions toward reuse or the environmentally preferable option, allows the purchasing office to reject purchase requests that do not follow the policy, and enables Ecology to use purchase authority to buy products with more environmental attributes than available through the Department of General Administration (GA). Committee members have also been working with GA to make environmentally preferable products available and easier to identify.

One major accomplishment this year was our analysis of our building recycling programs. By looking at the costs, we were able to find an alternate vendor who saves us nearly $10,000 per year.

Chapter IV Statewide Litter Prevention and Cleanup Programs

Chapter 70.93 RCW, *the Waste Reduction Recycling and Model Litter Control Act*, places Ecology in the leadership role of managing statewide litter programs. Work during 2001 and throughout 2002 focused on planning and implementing the first statewide litter prevention campaign in over ten years while maintaining significant levels of litter and illegal dump cleanup. Core elements of statewide litter program are:

- Administering allocations from the Litter Account;
- Strengthening partnerships with other state agencies and local government;
- Facilitating communication and coordination of litter control and prevention activities;
- Administering the Community Litter Cleanup Program (CLCP);
- Implementing a litter prevention campaign; and,
- Deploying the Ecology Youth Corps (EYC).

State Launches Litter Prevention Campaign

The most significant work in 2001 involved planning a comprehensive litter prevention strategy to change the behavior of litterers. Based on research conducted in 1999, the campaign focuses on roadside litter deposited through the following behaviors: deliberate tossing of cigarette butts, beverage containers, and other packaging; uncovered and unsecured loads; and failure to clean out the beds of pickup trucks. Based on focus group research the campaign messages have an enforcement-theme with information about littering fines and penalties.

The "Litter and it will hurt" campaign is a social marketing campaign aimed at reducing litter on Washington roadways. The campaign uses multiple strategies over a three-year period to first raise awareness, then alter beliefs, and ultimately change behaviors. Key elements include a media campaign (television, print, and radio); operation of a litter hotline; a roadway and retail signage program; a website; ongoing public relations; distribution of litterbags and campaign materials; and an enforcement plan.

The Solid Waste & Financial Assistance Program (SW&FAP) launched the "Litter and it will hurt" campaign with a series of news conferences in April 2002. News conferences held in Seattle, Spokane, Richland and Vancouver, generated significant media attention to the litter problem and the campaign. The objectives of this first year of the campaign were to raise awareness of the fines associated with littering and about the toll-free litter hotline. The impact of the campaign will be measured when SW&FAP repeats the litter survey in 2004, to measure the quantity and types of litter in Washington. However, the campaign was designed to include interim measures to track our progress.

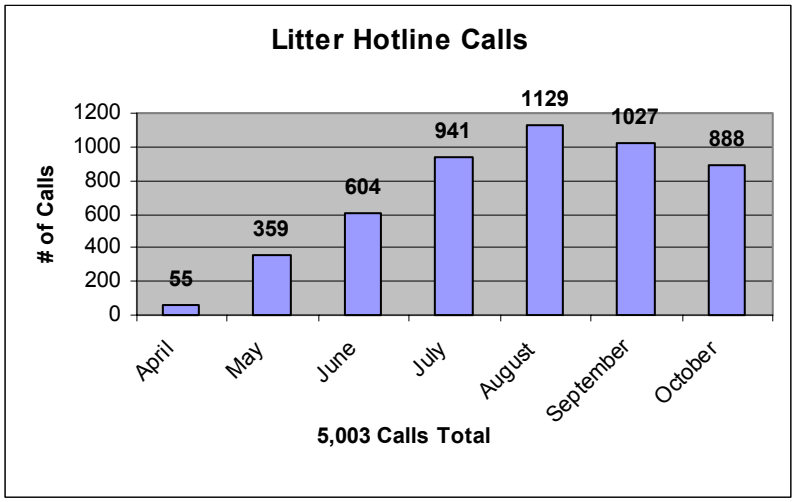
Data suggest that the State made good progress towards achieving the first year objectives of raising awareness. Telephone survey results provided to Ecology by Belo Marketing Solutions and Survey U.S.A. are presented in the table below. More specific information about the main campaign strategies follows.

Comparison of Benchmark and Tracking for the Litter Campaign April – September 2002
➢ 51% of respondents have seen or heard the slogan "Litter and it will hurt." Up from 14% in the benchmark study.
➢ 70% of respondents remember seeing road signs, posters or a slogan about litter. Up from 57% in the benchmark study.
➢ 32% of respondents remember seeing or hearing advertising, news or public service messages about littering. Up from 23% in the benchmark study.
➢ 28% of respondents are aware of a toll free number to report littering. Up from 20% in the benchmark.
➢ 17% believe that they are not at all likely to get caught and fined. This is down from 27% who believe they are not at all likely to get caught in the benchmark study.
➢ 42% of respondents would say that fines for littering are very severe or severe. Up from 31% in the benchmark.

Media: Humorous television and radio commercials that focus on the fines for littering were broadcast statewide over a 16-week period. They feature Torquemada, the Grand Inquisitor from the 15th century, arguing for stiffer punishments for litterers. Several sponsors produced their own commercials with the campaign litter message, adding depth and breadth to the media buy. On television, 2,843 spots were aired, not including "free time," creating an estimated 53 million gross impressions.

Litter Hotline: In conjunction with the campaign launch, SW&FAP started a litter hotline. By dialing 1-866-LITTER-1, people can report the license plate number of vehicles they see litter coming from. The license plate is cross-referenced with the registered owner of the vehicle, who will get a stern letter from Washington State Patrol. The hotline is available 7 days a week, 24 hours a day. Calls have steadily increased since April 2002, as presented in the Figure 4.1.

Figure 4.1
Litter Hotline Calls



Signage: The Washington State Department of Transportation posted 136 new "Litter and it will hurt" road signs statewide. The signs feature the campaign slogan and the litter hotline phone number. Sign specifications were also provided to local governments, some of whom opted to post the signs on county roads and local streets.

Website: A website with information about statewide litter programs and the "Litter and it will hurt campaign" was launched in conjunction with the campaign. It contains information about litter laws, fines, publications, various litter pickup program, and statistics, with separate pages dedicated to information about the campaign. In September 2002, over 10,312 people visited the new website. The address is: www.ecy.wa.gov/programs/swfa/litter

Enforcement: Washington State Patrol (WSP) was Ecology's primary partner on enforcement issues. In addition to helping manage the litter hotline, WSP helped the campaign by reinforcing the campaign message through issuance of tickets, and written and verbal warnings. At the time of this writing, statistics from 2002 were not yet available, but in 2001, WSP issued 4,351 litter citations.

Distribution of Campaign Materials: SW&FAP had a limited print budget for campaign materials such as car litterbags, posters, window decals and bumper stickers. Design materials were provided to our local government and state agency partners to produce on their own. Ecology also coordinated a joint-order on behalf of our partners to meet minimum order requirements and to qualify for a volume discount. Through this program 120,000 litterbags, 5,000 posters, 20,000 stickers, and 20,000 window decals were ordered and distributed. Over 20 entities participated, ensuring broad distribution of campaign materials.

Partnerships: The campaign would not have been successful without the participation and support of other state agencies, local governments and businesses statewide. Partners helped the campaign succeed through signage programs, distribution of materials, media relations, special events, displays, media sponsorship and messaging. Major campaign partners are highlighted in the table below.

Major Campaign Partners
• **Private Sector:** – Lincoln Mercury Dealers of Washington – Ziggy's Home Improvement – American Car Care – BELO Television and Belo Marketing Solutions – Fox Sports Net – Mariners
• **Public Sector** – Department of Transportation – Washington State Patrol – Department of Natural Resources – Department of Corrections – Parks & Recreation Commission – Local Government - County Solid Waste & Public Works Departments
• **Non-Profit Sector** – Washington State Recycling Association – Local Communities

The "Litter and it will hurt" campaign is currently scheduled to continue through 2003, taking advantage of the positive momentum generated in 2002.

Litter Program Funding

Significant portions of the Waste Reduction, Recycling and Model Litter Control Account (WRRMCLA) support litter and illegal dump cleanup on public roads and lands through variety of programs. The legislation directs the allocation of litter funds as follows: twenty percent to fund the Community Litter Cleanup Program (CLCP), thirty percent to fund waste reduction and recycling efforts within Ecology, and fifty percent to fund litter clean-up efforts. Besides funding the Ecology Youth Corps (EYC), the fifty-percent dedicated to clean-up efforts also funds litter activities carried out by other state agencies. Funding for the litter prevention campaign also comes from the fifty percent.

This biennium (July 2001 – June 2003), the appropriation from the WRRMLCA was $12.43 million divided as directed by the legislation into 3 main categories:

- Community Litter Cleanup Program 20% $2.86 million
- Waste Reduction & Recycling Activities 30% $3.54 million
- Litter Cleanup & Prevention 50% $6.03 million

TOTAL **$12.43 million**

The fifty percent dedicated to clean-up efforts and prevention was broken down as follows:

- Other state agencies $1.03 million
- Prevention campaign $0.70 million
- Administration & coordination $2.00 million
- Operation of Ecology Youth Corps $2.30 million

TOTAL **$6.03 million**

During the 2002 session, the Legislature directed Ecology to disburse supplemental funding from the WRRLCA. An additional $250,000 went to the Community Litter Cleanup Program and an additional $500,000 went to the Department of Natural Resources.

Litter Cleanup by Other State Agencies

The state agency litter workgroup continues to function, meeting several times a year to review activities, improve coordination, and discuss future funding. The workgroup is comprised of representatives from Departments of Corrections, Natural Resources, Transportation, and the Parks and Recreation Commission. Using a consensus process, the workgroup negotiated $1.097 million in interagency agreements to fund litter activities carried out by the state agencies during the '99 - '01 biennium, and $1.030 for the '01-'03 biennium. Supplemental funding appropriated in 2002 brought the current biennium total to $1.53 million. Table 4.1 shows the funding provided through interagency agreements for each biennium.

Table 4.1
Interagency Agreements between Ecology and Other State Agency for Litter Activities
July 1, 1999– June 30, 2003

Agency	FY00/01	FY02/03
Dept. of Corrections	$492,000	$466,000
Dept. of Natural Resources	$497,000	$468,000
Dept. of Natural Resources (supplemental)	$0	$500,000
Dept. of Transportation	$78,000	$70,000
Parks & Recreation	$30,000	$26,000
TOTAL	**$1,097,000**	**$1,530,000**

Department of Corrections

The Department of Corrections (DOC) receives funding through Ecology to run community based correctional litter crews. These crews pickup litter on state roads, on state lands, and in local communities, providing valuable cleanup service. The '01-'03 interagency agreement between Ecology and DOC provided funding ($452,000) for year-round correctional crews in Spokane, Ellensburg, Wenatchee, an administrative position in Seattle, and half-year crews in Pasco and Walla Walla. The remaining $14,000 was used to support litter campaign activities, such as displaying campaign posters in all DOC offices, putting campaign window decals on DOC vehicles, and distributing car litterbags at DOC offices. Table 4.2 summarizes activity of DOC crews.

Table 4.2
Department of Corrections Litter Removal Activity
Last Biennium and Fiscal Year 2002

	FY00	FY01	FY02
Hours of Work (supervisor and offender)	50,719	54,296	44,086
Pounds of Litter & Illegally Dumped Materials Removed	621,062	833,549	682,029
# of illegal dump sites cleaned	345	553	406
Miles of road cleaned	6,185	5,537	2,969
Acres cleaned	2,203	3,088	1,463

Department of Natural Resources

The Department of Natural Resources Camps Program, in partnership with Department of Corrections, puts offender crews to work on state lands. As illustrated by the data in Table 4.3, this program continues to have a tremendous impact on the cleanup of litter and illegally dumped materials on state-owned forests. The '01-'03 interagency agreement between Ecology and DNR provides funding ($468,000) for part time crews at the following camps: Naselle, Larch, Cedar Creek, Mission Creek (program ended spring 2002), Monroe, Olympic, Airway Heights and the Washington Correction Center for Women (program began summer 2002). In March 2002, Ecology received direction from the Legislature to pass an additional $500,000 of supplemental budget dollars to DNR, bringing the biennial total to $968,000. Funding for cleanup crews was expanded to include contracted and volunteer crew activities as well as some enforcement activities.

Table 4.3
Department of Natural Resources Litter Removal Activity
Last Biennium and Fiscal Year 2002

	FY00	FY01	FY02
Hours of Work (supervisor and offender)	22,114	33,493	41,992
Pounds of Litter Removed	104,603	143,189	168,539
Pounds of Illegally Dumped Materials Removed	192,116	399,087	552,251
# of illegal dump sites cleaned	174	535	516
Miles of road cleaned	1,282	3,269	2,554
Acres cleaned	161	122	107

Department of Transportation
The Department of Transportation (DOT) is responsible for picking up litter along state roads including the bags of litter collected by Ecology Youth Corps, Department of Corrections, and Adopt-a-Highway groups. The '01-'03 interagency agreement between Ecology and Transportation provides funding ($70,000) to offset the costs of disposal. Table 4.4 summarizes the litter work accomplished by Transportation crews.

Table 4.4
Department of Transportation Litter Removal Activity
Last Biennium and Fiscal Year 2002

DOT Region	Amount of Litter Disposed (Cubic Yards)			Total Pickup Costs (Labor/Equipment)*		
	FY00	FY01	FY02	FY00	FY01	FY02
Northwest	4,017	5,281	5,983	$261,921	$417,879	$360,032
North Central	1,084	1,013	1,107	$76,660	$65,134	$80,197
Olympic	642	1,627	1,412	$189,859	$256,784	$242,169
Southwest	751	4,456	1,106	$251,613	$271,301	$286,228
South Central	2,163	4,994	2,715	$182,705	$223,486	$243,720
Eastern	1,692	2,367	1,434	$194,939	$237,035	$270,244
Total	**10,349**	**19,738**	**13,757**	**$1,157,697**	**$1,471,619**	**$1,482,590**
*Does not include disposal costs						

Parks and Recreation Commission
The Parks and Recreation Commission (Parks) traditionally uses litter funds on waste reduction and recycling efforts as well as litter control. Most litter collection is done by park rangers, park users, and volunteers. Parks used the $30,000 provided through the '99-'01 interagency agreement to purchase recycling equipment and signage at two state parks and to buy litter cleanup supplies. For the '01-'03 agreement, Ecology has set aside $26,000 to fund activities including disposal of illegally dumped materials, continued recycling programs in parks, distribution of campaign litterbags and support of a pet waste disposal program.

Ecology Youth Corps

Fiscal year 2002 marked the 27th year of operation for the Ecology Youth Corps (EYC). Under chapter 70.93 RCW, the *Waste Reduction, Recycling, and Model Litter Control Act*, the EYC operates as a "…litter patrol program to employ youth from the state to remove litter from places and areas that are most visible to the public…"

EYC operates two types of crews, median crews and youth crews. Median crews are composed of young adults 18 years and older who clean complex and challenging areas such as highway median strips, interchanges, and other high traffic areas. Some median crews begin operation as early as spring and run through the end of fall, while others work solely in the spring or fall.

The EYC Youth crews consist of 14–17 year old youth who clean shoulder areas and interchanges of major state and interstate highways as well as city and county roads, public access areas, school grounds and other public areas. Summer Youth crew members work one four-week session at the beginning of summer, with a complete turnover of crews occurring mid-summer. Weekend crews work weekends in the Eastern region at various times during the year.

Crews were based in the following counties:

NWRO: King, Kitsap, Skagit, Snohomish, and Whatcom.
SWRO: Clark, Grays Harbor, Lewis, Mason, Pacific, Pierce, Thurston.
ERO: Adams, Asotin, Grant, Ferry, Franklin, Garfield, Spokane, Stevens, and Whitman.
CRO: Benton, Chelan, Kittitas, Klickitat, Okanogan, and Yakima.

This fiscal year crews were responsible for picking up a grand total of 65,543 bags of litter over a total of 4,571 road miles and 1,280 acres. This is the equivalent of 492 tons of litter, or 131,086 cubic feet. Of this total amount of litter 9,641 bags were recycled, representing approximately 72 tons.

The Ecology Youth Corps also ensures that youth learn about the environment. Crews learn about waste reduction, litter abatement, recycling, composting, and other environmental issues such as global warming, water quality, salmon recovery and the principles of sustainability.

Community Litter Cleanup Program

The Community Litter Cleanup Program (CLCP) was developed and implemented in 1998 with the goal of providing help to local government with the growing problems of litter and illegal dumps. Now in its 4th cycle, the CLCP continues to be a key element of statewide litter cleanup programs.

CLCP Program Cycles	
1st Cycle	April 1998 - December 1998
2nd Cycle	January – December 1999
3rd Cycle	January 2000 – June 2001
4th Cycle	July 2001 – June 2003

During the fourth cycle, 41 out of the 41 eligible jurisdictions participated.[1] In the fourth cycle, $2.73 million was dedicated to the program, with each recipient eligible to receive approximately $66,600. In the spring of 2002, the Legislature directed another $250,000 to the CLCP program, bringing the biennial total to $2.98 million. Not all eligible jurisdictions applied for the supplemental funding. Table 4.5 below highlights the work accomplished during the first half of the fourth cycle.

[1] Solid waste planning jurisdictions are eligible to participate in the program. This includes the 39 counties plus the cities of Seattle and Everett. .

Table 4.5
Statistics from the Community Litter Program
July 2001 – June 2002

Volunteer Hours	15,869
Correctional Crew Hours	122,763
Supervisor Hours	35,503
TOTAL HOURS	**174,135**
Road Miles Cleaned	21,329
Acres Cleaned	29,720
Number of Specific Dump Sites Cleaned Up	2,644
Pounds of Litter Picked Up	1,726,069
Pounds of Illegally Dumped Materials Picked Up	1,569,428
Pounds of Material Recycled	515,043
TOTAL POUNDS	**3,810,540**

A majority of jurisdictions use jail or community service crews to accomplish the work. Besides the tremendous amounts materials picked up through the program, the use of offender crews provides significant savings to local jails and returns labor value to participating communities. In addition to getting litter and illegal dumps cleaned up and putting offenders to work, a success of the program is getting individuals and businesses involved at the local level, and building a sense of stewardship.

Looking Ahead

Washington State litter programs seem to be making a difference in our state, offering several bright spots this year. But we must remain vigilant. While approximately 7 million pounds of litter and illegally dumped materials are picked up each year, our research estimates that over 22 million pounds are littered on state roadways and in public areas annually. The "Litter and it will hurt" campaign offers hope that we may finally begin to reduce the quantity of litter deposited on state roadways. Until the litter survey is repeated in 2004, SW&FAP will continue to monitor several indicators of our progress towards zero litter.

Now that a prevention strategy has been developed and implemented, SW&FAP will devote significant resources continuing the campaign effort, building on partnerships with state agencies, local governments, and businesses to extend the reach and impact of the campaign over the next two years. The challenge will be finding a balance between implementing the prevention campaign and maintaining a basic level of cleanup, in light of major budgetary challenges facing the state.

Chapter V The 2001 Recycling Survey for Washington

In 1989, the Legislature, in amending the *Solid Waste Management Act* (chapter 70.95 RCW) set a state recycling goal of 50%, to be achieved by 1995. They also stated that recycling should be made at least as affordable and convenient to citizens as garbage disposal.

In response, local governments began putting in place various forms of recycling ranging from drop boxes to curbside collection of a variety of recyclable materials. In the year 2001, over 150 cities and counties offered curbside collection of recyclable materials such as glass, paper, and metals while about two-thirds of those cities and counties offered curbside collection of yard waste. The availability of recycling collection programs in the commercial sector (both publicly and privately operated) is also increasing, and the amount of materials collected on these programs far outweighs what is collected in the residential sector.

Despite all the efforts made by citizens, government, and industry, the 50% goal was not attained by 1995 (see Table 5.1), and in 2002, the Legislature amended the state goal to be achieved by 2007. They also set a state goal to establish programs to eliminate yard waste in landfills by 2012. With these goals in mind, as well as the "Beyond Waste" vision of zero waste, we must reaffirm our commitment to an accurate measure of our performance in the area of recycling and waste reduction. The Solid Waste & Financial Assistance Program (SW&FAP) continues to operate the Annual Recycling Survey, and is concurrently preparing for some changes in the way the survey is conducted in years to come. These changes will take into consideration the state solid waste plan of "Beyond Waste" and the goals laid out in that plan.

Table 5.1
Recycling Rate 1986 to 2001

1986	15%
1988	28%
1989	27%
1990	34%
1991	33%
1992	35%
1993	38%
1994	38%
1995	39%
1996	38%
1997	33%
1998	35%
1999	33%
2000	35%
2001	37%

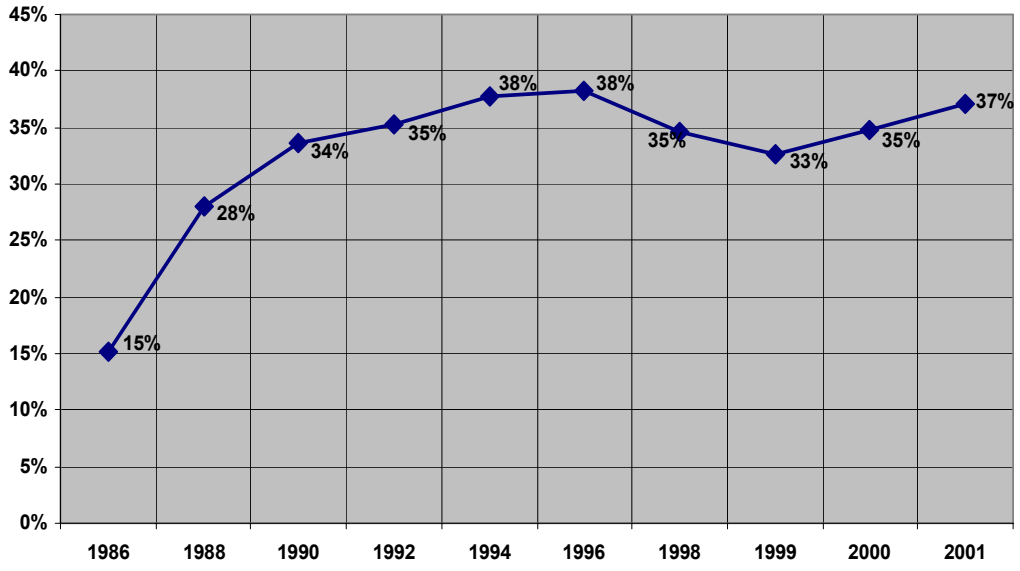
Recycling Rates

Each year since 1987, Ecology has conducted a survey to measure the statewide recycling rate. Information is provided by local governments, haulers, recyclers, brokers and other handlers of materials from the recyclable portion[2] of the waste stream that are collected for recycling.

[2] The recyclable portion of the waste stream is municipal solid waste as defined by the Environmental Protection Agency in the *Characterization of Municipal Solid Waste in The United States: 1996 Update*. This includes durable goods, nondurable goods, containers and packaging, food wastes, and yard trimmings. It does not include industrial waste, inert debris, asbestos, biosolids, petroleum contaminated soils, or construction, demolition, and landclearing debris disposed of at municipal solid waste landfills and incinerators.

From 1986 to 1993, the measured statewide recycling rate increased from 15% to 38%. This increase had been fairly steady, with a slight dip in 1991. In 1994 the measured recycling rate remained steady at 38%. In 1995, the recycling rate resumed its climb to 39% and in 1996 the rate dropped to 38%. The 1997 recycling rate dropped again to 33% as a result of poor paper fiber market in Asia and a continued glut in the metals market. The poor paper and metal market trend continued in 1998, but improved enough to raise Washington's recycling rate to 35%. Although markets improved in 1999, the tonnage disposed of increased enough to drop the recycling rate to 33%. Markets continued to improve in 2000, raising the recycling rate to 35%. Although markets for most materials fell in 2001, the increased activity and better reporting for key materials brought the rate to 37% (See Figure 5.1 for even-year data and Appendix B for the complete graph). The Solid Waste & Financial Assistance Program Web site has data on materials recovery since 1986: http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

Figure 5.1
Washington State Recycling Rate 1986 to 2001
Even Years to 1999



Although cities and counties have built an extensive collection infrastructure initiated by the Waste Not Washington Act, recycling rates have not reflected this availability of recycling as much as expected. Some of the factors which could be influencing this trend include diminishing education on recycling and resulting lack of concern, diminishing concern over landfill space, convenience and cost of recycling, more disposable income thus more spending on consumer goods, product/packaging design and decreased landfill tipping fees, increased waste generation in the commercial sector, and low demand for recycled materials (closing the recycling loop). Another important factor which can influence the recycling rate is the willingness of recyclers to report their collected tons to SW&FAP. State law requires collectors of recyclable materials to report what they collect; however, there are no penalties for those who do not comply.

As of this writing, 82.4% of the state's population now has access to curbside recycling services, which are intended to be as convenient as disposal. Most of the people who do not have curbside services do have access to drop-box recycling. The state's population is growing, with about half a million new people since 1995. SW&FAP believes that this group may not participate as much in recycling programs since they were not exposed to the waste reduction and recycling outreach programs run by Ecology and the counties in the early 1990s.

Recent studies and changes in Olympia, Tacoma, Seattle, and Spokane collection programs have shown opportunities for significant increases in customer base and efficiency in their refuse and recycling collection. Education efforts in the Olympia and Tacoma curbside programs, which went along with recent changes in collection service, brought significant increases in participation rates for curbside as well as drop-off collection centers. The apparent affect of these educational efforts tapered off within a year to show much less significant increases in growth for 2000, and a drop in per capita recovery rates for 2001 (and in some cases an actual decrease in tonnage collected).

Yard waste collection, however, increased from 2000 to 2001 in these cities. This could be attributed to the low cost to participate in curbside yard waste as opposed to paying garbage prices to dispose of this material. Cities can normally afford to offer yard waste collection at lower prices than curbside collection of other recyclables, providing an economic incentive which is helping these programs to achieve great success.

Frequency of collection (weekly, biweekly) has also been shown to be an important determinate of the amount collected on curbside programs. The City of Seattle attributes a drop in the tons recovered on their curbside programs in 2000 and 2001 partly to the change in collection from weekly to biweekly. As more cities implement less frequent collection on curbside as an efficiency measure, without the corresponding education needed to offset the decline in participation, we could see a decline in tonnage collected on these programs.

Commercial recycling (or nonresidential sector recycling) increased by 16% in 2001. Based on tonnage figures reported by recyclers who provide service to the nonresidential sectors, these programs seem to be highly successful in diverting large volumes of materials away from disposal with minimal government regulation or oversight. Businesses are encouraged by the economic incentive to reduce their waste output through recycling.

2001 Recycling Survey Process and Results

There are many challenges in obtaining all of the information needed to prepare a complete and accurate recycling survey. As is mandated by the Legislature, SW&FAP carries this out every year, reporting the results to appropriate stakeholders. SW&FAP believes the results are fairly reliable to most counties based on review of draft numbers sent to local governments, and comparisons to waste characterization, disposal data, and commodity end-user information.

Recycling survey forms are sent to recycling firms, haulers, and local governments to obtain information about types and quantities of recyclable materials collected. However, since there is no penalty for not returning the information, some firms do not respond. Other firms respond with estimates of the amount and origin of the materials, which can call into question the accuracy of the survey. These factors make it very difficult to compile good recycling information for specific counties. The difficulties also create the need for intensive cross-checking of the data, which is done through a process of communication with the end-users of recyclable materials and local governments to develop aggregate figures for each commodity, which are compared to the survey results collected.

Table 5.2 provides tonnage figures for each material in the 1998-2001 recycling surveys. See Tables 5.3 and 5.4 for a comparison of generation, materials recovery, composting, waste diversion, and discards of municipal solid waste from 1986 to 2001.

Table 5.2
State Tonnage by Commodity: 1998-2001 Washington State Recycling Surveys[3]

Commodity	1998	1999	2000	2001
Newspaper	200,448	168,832	219,716	**176,392**
Corrugated Paper	344,886	478,074	495,470	**491,230**
High Grade	69,436	61,212	59,976	**58,538**
Mixed Waste Paper	207,225	253,428	273,494	**231,302**
Aluminum Cans	12,716	14,357	17,945	**12,540**
Tin Cans	13,003	12,340	22,632	**11,483**
Ferrous Metals	225,373	241,367	357,220	**254,104**
Nonferrous Metals	55,385	30,956	51,273	**41,615**
White Goods	12,233	28,524	35,427	**39,180**
Computers	N/A	9	255	**317**
Refillable Beer Bottles	261	63	0	**0**
Container Glass	113,077	58,517	84,062	**81,632**
PET Bottles	3,031	2,911	5,100	**4,661**
LDPE Plastics	1,342	2,225	4,032	**6,603**
HDPE Containers	3,889	3,253	5,491	**4,841**
Other Recyclable Plastics	1,609	3,971	6,512	**4,067**
Aseptic Packaging	N/A	N/A	98	**69**
Other Rubber Materials	N/A	N/A	55	**374**
Vehicle Batteries	7,738	15,142	10,757	**16,297**
Tires	2,106	1,514	12,218	**10,306**
Used Oil	41,162	6,352	8,353	**38,288**
Yard Waste	608,128	525,454	450,761	**448,222**
Food Waste	92,392	72,646	73,895	**193,024[4]**
Wood Waste	115,289	142,787	215,211	**538,242[5]**
Textiles (Rags, clothing, etc.)	3,979	12,525	15,961	**10,127**
Fluorescent Light Bulbs	N/A	167	160	**346**
Gypsum	31,062	29,897	36,692	**29,883**
Photographic Films	0	81	6	**87**
Total Recycled	2,165,770	2,166,608	2,462,772	**2,703,772**
Total Disposal[6]	4,088,100	4,480,761	4,610,914	**4,583,253**
Total Generated	6,253,870	6,647,369	7,073,686	**7,287,025**
Recycling Rate	35%	33%	35%	**37%**

[3] Detail may not add due to rounding.
[4] Increase attributed to a combination of actual increase in food waste collection and increased reporting from recyclers.
[5] Increase attributed to a combination of actual increase in wood waste collection and increased reporting from recyclers.
[6] The amount of material disposed of represents only the quantity defined "recyclable portion" of the waste stream and excludes industrial, inert, asbestos, biosolids, petroleum contaminated soils, and construction, demolition and landclearing debris disposed of at municipal solid waste landfills and incinerators.

Table 5.3
Generation, Materials Recovery, Composting,
Waste Diversion, and Discards of Municipal Solid Waste
(millions of ton)
1986-2001

Millions of tons[7]										
	1986	**1988**	**1990**	**1992**	**1994**	**1996**	**1998**	**1999**	**2000**	**2001**
Generation	3.0	5.1	5.6	6.1	6.6	6.5	6.3	6.6	7.1	7.3
Recovery for Recycling	0.5	1.4	1.8	2.0	2.2	2.1	1.6	1.6	2.0	2.3
Recovery for Composting	Na	Na	0.1	0.2	0.3	0.3	0.6	0.5	0.5	0.4
Recovery for Diversion[8]	Na	Na	Na	Na	Na	Na	Na	0.2	1.4	1.6
Total Materials Recovery	0.5	1.4	1.9	2.2	2.5	2.5	2.2	2.2	2.5	2.7
Discards After Recovery	2.5	3.7	3.7	3.9	4.1	4.0	4.1	4.5	4.6	4.6

Table 5.4
Generation, Materials Recovery, Composting,
Waste Diversion, and Discards of Municipal Solid Waste
(percent of total generation)
1986-2001

Percent of total generation										
	1986	**1988**	**1990**	**1992**	**1994**	**1996**	**1998**	**1999**	**2000**	**2001**
Generation	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Recovery for Recycling	15.2%	28.0%	31.9%	32.7%	32.9%	33.0%	24.9%	24.7%	28.4%	31.0%
Recovery for Composting	Na	Na	1.7%	2.6%	4.8%	5.2%	9.7%	7.9%	6.4%	6.2%
Recovery for Diversion[9]	Na	Na	Na	Na	Na	Na	Na	2.9%	16.4%	17.7%
Total Materials Recovery	15.2%	28.0%	33.6%	35.3%	37.8%	38.2%	34.6%	32.6%	34.8%	37.1%
Discards After Recovery	84.8%	72.0%	66.4%	64.7%	62.2%	61.8%	65.4%	67.4%	65.2%	62.9%

In 2001, SW&FAP piloted a Web-based reporting system, which was encouraged by several survey stakeholders and promised to provide a faster, more efficient way for respondents to enter their tonnage information. SW&FAP was hoping that this service would help get the information faster and allow the finalizing of a recycling rate earlier in the year.

Even with the detailed instructions provided on the Web site, there is a possibility for error in entering each survey, which is greatly reduced when there is one person designated for the data entry. Giving reporters the possibility to directly enter the data greatly increased the amount of errors and time required to double-check the data. Less than 5% of reporters used the Internet system, which is far less than expectations. With the piloting of this system, SW&FAP discovered that the majority of survey respondents who would use such a system are the ones who were already highly likely to complete their survey forms correctly, and in whatever form it was required. One of the intentions

[7] Detail may not add due to rounding.
[8] Not included in Total Materials Recovery or Generation – shown for comparison only.
[9] Not included in Total Materials Recovery or Generation shown in table – shown for comparison only. Comparison calculated as follows: Recovery for Diversion/(Recovery for Diversion + Generation).

with the on-line data entry form was to encourage the non-reporters or late reporters to comply. It was determined that the system would not meet its original intentions, would even hinder the accuracy and timeliness of the survey, and therefore it was abandoned.

Beginning in January of 2002, for the 2001 reporting year, the survey form along with instructions was available on the Internet to print and complete manually, or to type on-line and e-mail to Ecology. This system provided a possibility to access the form by computer, for participants who were interested. The system proved to be very successful. It provided the crucial and time-saving computer access to the survey, which was necessary for some respondents. It also allowed SW&FAP staff to check the forms and follow up on errors or calculate conversion (pounds to tons, for example) before the data was entered into the off-line database. This step provides a crucial double check in maintaining integrity of the data.

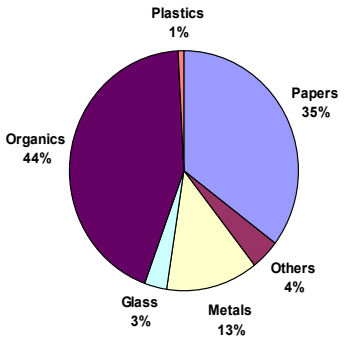
Market Trends

The slight climb in the recycling rate since 1999's ten-year low, unfortunately is not an indication that the markets in general are on their way to recovering, and the rate will resume its upward trend of the early to mid-1990s. The actual downturns in collected amounts of the traditional recyclables would instead indicate that the markets are still poor for the Washington area. The fact that the rate increased despite these downturns is an indication that the recycling environment is changing, and the new recycling programs for nontraditional materials have made a great impact on the actual tonnage being diverted from disposal.

The lag in the actual amounts collected for the "traditional" recyclable materials, such as aluminum, glass, and cardboard, would show that economic and environmental policies are not yet in full alignment with regard to recycling. For example, market prices for both virgin and recycled materials do not always reflect the full societal and environmental costs associated with obtaining and processing those materials. Distortions such as subsidies can affect the economic competitiveness of recycling. Government policies and regulations can play a significant role in ensuring that the prices of virgin and recycled commodities reflect their actual environmental and societal costs.

The recycled materials stream breaks down to six general categories (Figure 5.2). Organic materials (including yard, wood, and food waste) make up 44% of the total recycled; paper products are next with 35%. Metals come in third with 13% of the total stream. The other categories make up just 8% of the total collected: glass accounts for 3%, plastics for 1% and others for 4% of the total.

Figure 5.2

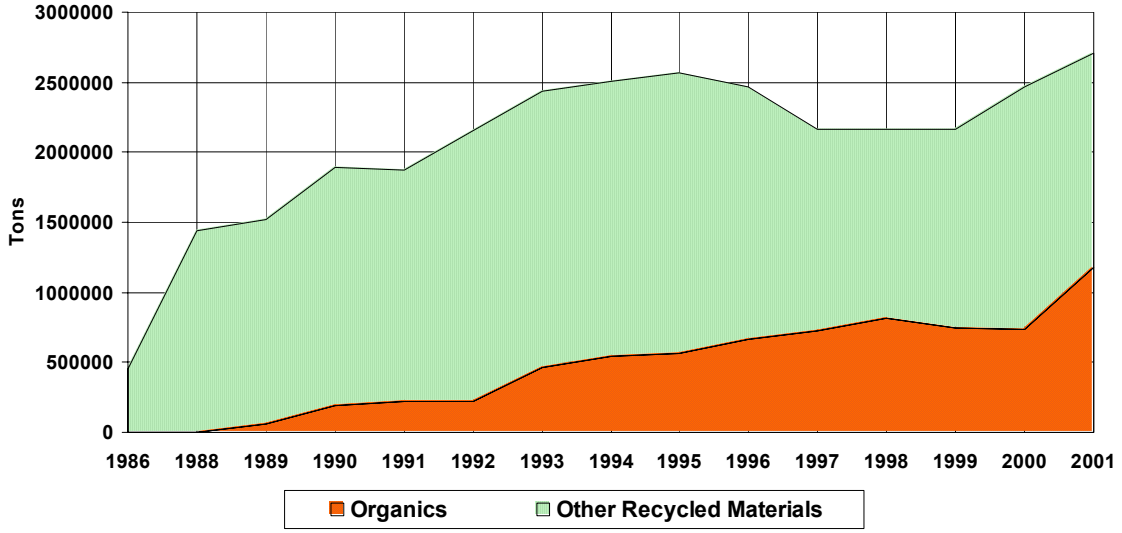


Recycled Materials Stream – 2001

Organic Materials

Organic materials, at 44%, moved into position as the dominant material category in the recycled materials stream in 2001 (see Figure 5.3 and Table 5.4). This category is made up of yard, wood, and food wastes. Over the years, paper has been the dominant material category overall, accounting for 43% of recycled materials in 2000. Actual tonnage of organic material increased by 59% this year, due to the high amounts of wood waste reported. Although the total for yard waste decreased, the total for wood waste and food waste increased, bringing the figure for organics as a whole up by 14%.

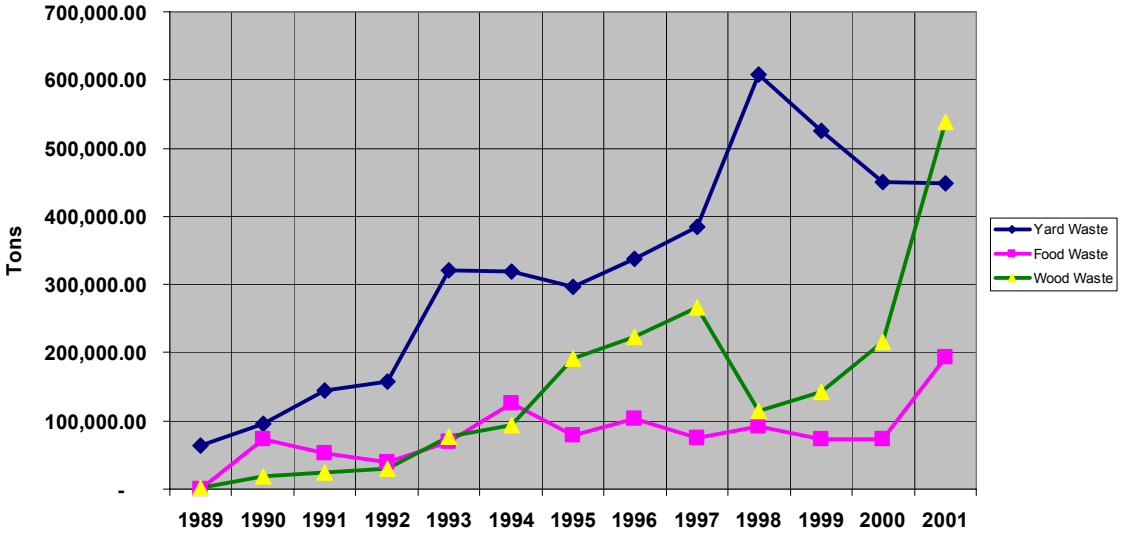
Figure 5.3
Organics Recycled 1986 to 2001
Yard, Wood and Food Wastes



Until 2001, yard waste has dominated the organics stream in the recycling survey (see Figure 5.4). With yard waste collection leveling off at about 450,000 tons, pending the construction and permitting of new composting facilities, this has made way for wood to take over as the leader of the organics stream. The great increase in reported tons of

wood collected for recycling is due both to an actual increase in the activity in the area of wood recycling, *and* to better capturing the data on the high amounts of wood which are traditionally recycled in Washington State. Even though the recycling survey has tracked wood in the past, greater emphasis is now being placed on the importance of including this data, which has resulted in better reporting.

Figure 5.4
Organics Recycling 1989-2001

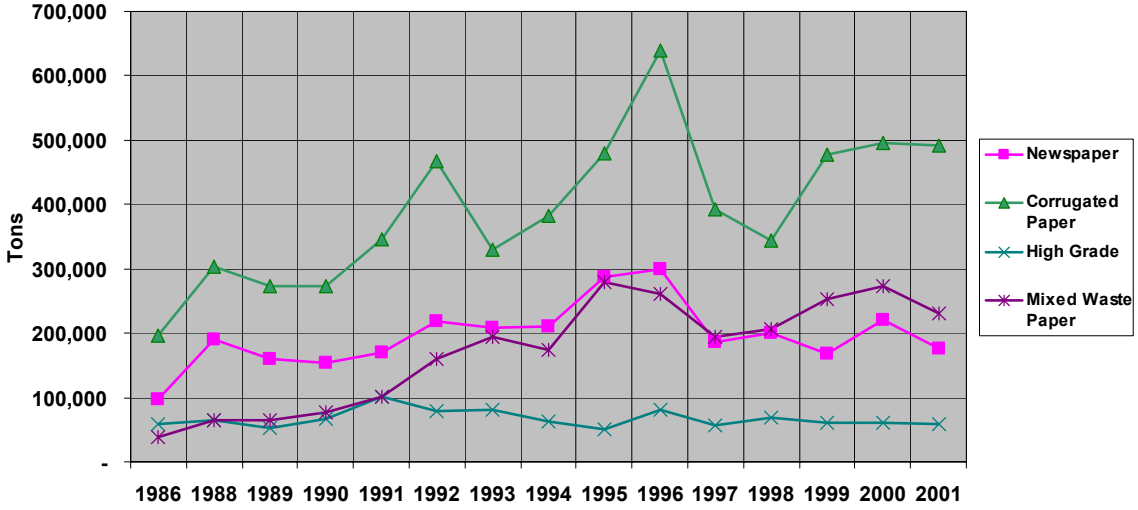


The food waste category, which has rendering of fats and oils as its greatest contributor, has also increased greatly, with an actual increase of over 100,000 tons. There are some additional collection programs which started in 2001; however, most of the increase in food waste collection can be attributed to an increase in reporting of this commodity.

Paper Products

For the first time since 1997, the markets for all the paper categories have fallen, due to continued low production at domestic mills and corresponding low demand (see Figure 5.5). The Asian markets, however, have an increasing demand and have kept the paper markets from falling out completely.

Figure 5.5
Paper Products 1986 to 2001



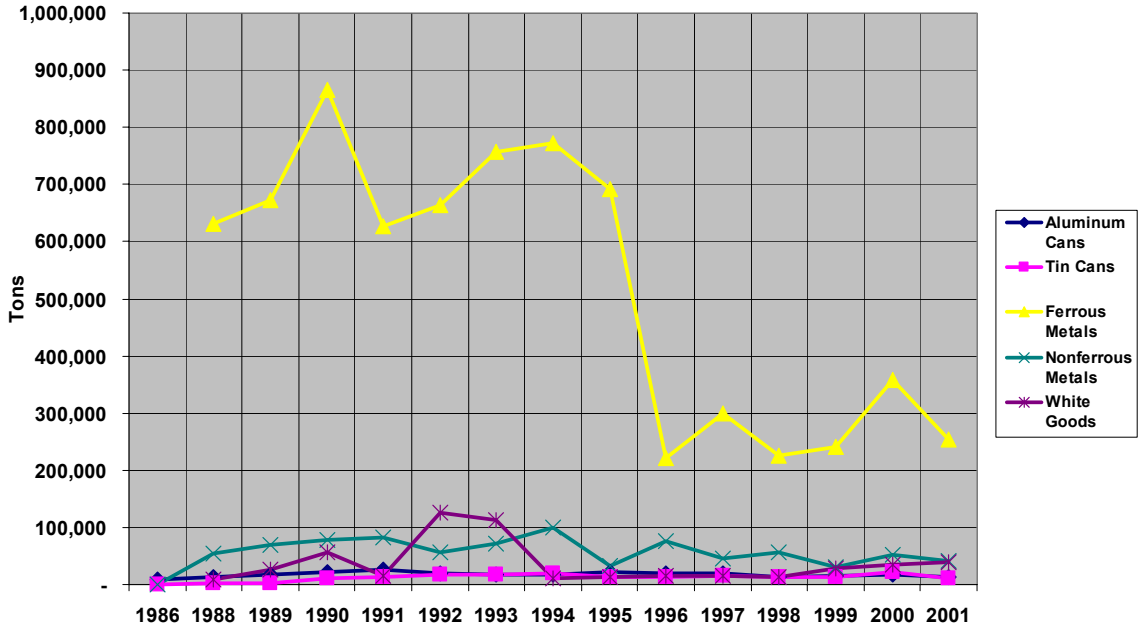
The market for corrugated paper started to drop in mid-2000 and continued through 2001 for a slight decrease in actual tonnage collected. Mixed waste paper dropped by 15% to offset the slight increase in 2000 from the 1998 and 1999 figures. High grade paper continued its steady decline, falling 2% in 2001. Newspaper collection has fluctuated after an all-time high in 1996. In 2001, newspaper decreased by 19%, the biggest fall of any paper product. This decrease followed suit with the drop in production of newsprint at North American mills.

Metals

The general category of metals, including ferrous, nonferrous, white goods, and aluminum and tin cans, dropped from its 20% of recycled materials share in 2000, to 13% in the year 2001 (see Figure 5.2). All categories of metals decreased from 2000 to 2001, except white goods which did increase slightly. Aluminum cans fell by 30%, tin cans by 50%, and nonferrous metals by 19%.

Reported tons of ferrous metals fell 29% from last year, consistent with a low trend that started after a sharp drop in 1996, when the Asian markets fell and recyclers started showing more reluctance to report their tonnage to SW&FAP (see Figure 5.7). If there was complete and correct reporting of ferrous metals collection, it is thought that Washington could see an increase in the total recycling rate of about 5%.

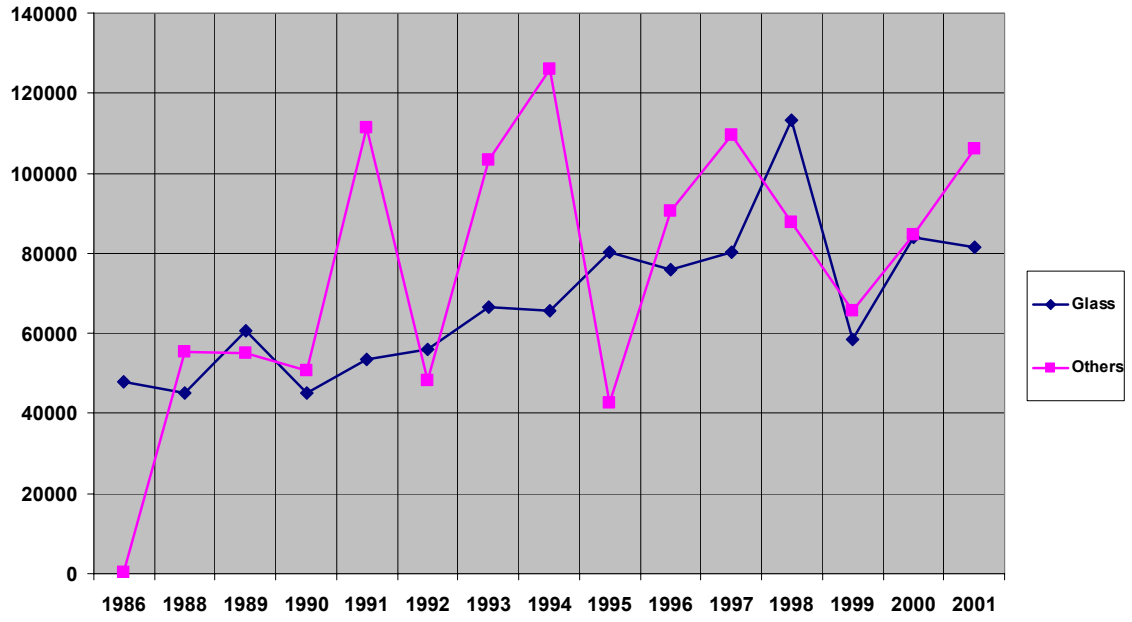
Figure 5.6
Metals Recycled 1986 to 2001



Glass, Plastics, and Other Recyclable Materials
Container glass and plastics both had decreased tonnage in 2001, although they still constitute 3% and 1% of the total recyclable materials stream, respectively (see Figure 5.2).

The use of refillable bottles as tracked by the recycling survey has shown zero since 2000. This option of using refillable bottles (the majority of the volume in past years has been in beer bottling) has become too costly for business owners and they have gone out of use almost completely. The exception to their complete demise is that some dairies are continuing to use refillable milk bottles, as a response to customer demands and in spite of them being more costly to use. Figure 5.7 shows the relationship between glass and other materials recycled from 1986-2001.

Figure 5.7
Glass & Other Materials Recycled 1986 to 2001



For plastics, the only type which showed increased tonnage collection for 2001 was LDPE (see Figure 5.8).

Figure 5.8
Plastics Recycling 1986 to 2001

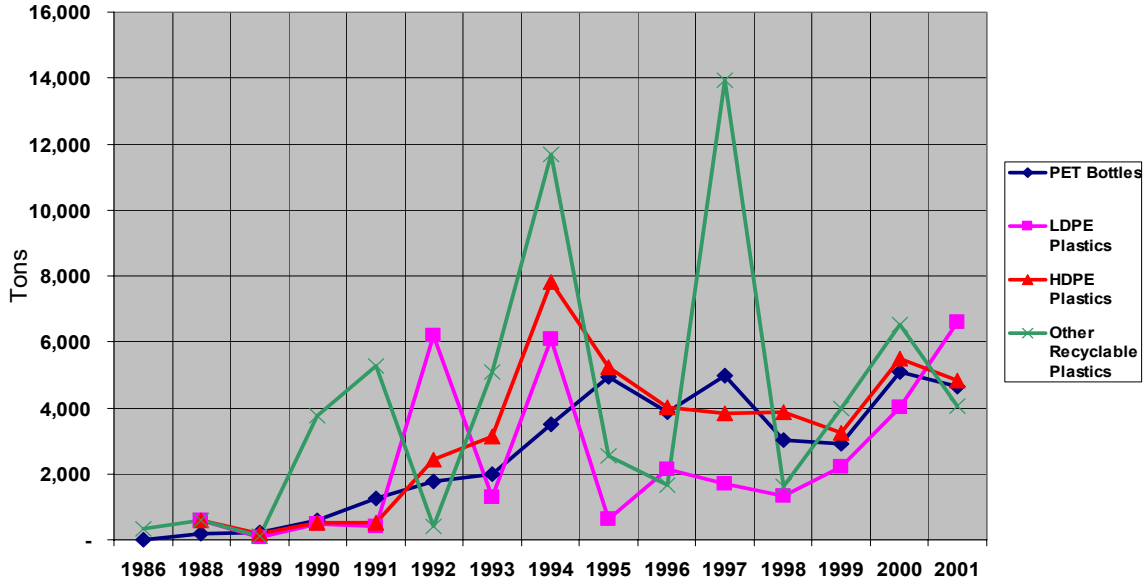
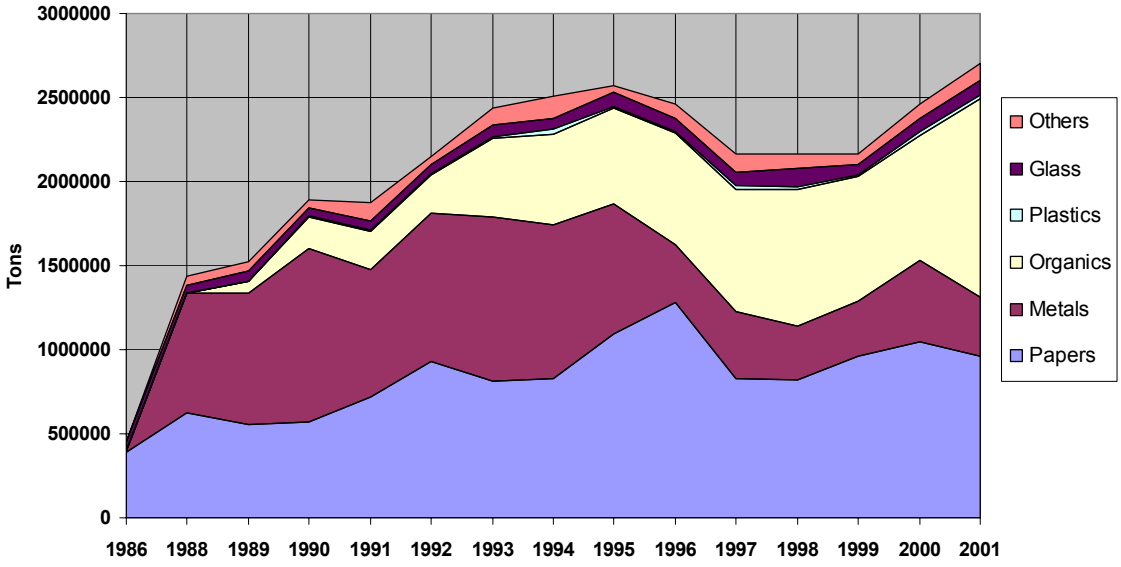


Figure 5.9 shows the relationship of the six major recycling categories discussed above from 1986-2001.

Figure 5.9
Six Major Recycling Categories 1986 to 2001



New commodities, which were included in the recycling rate for the first time in 2000, include aseptic packaging and computers. Aseptic packaging has been added as a commodity to several curbside programs, including the City of Seattle, in recent years. The commercial collection of computers and parts (or electronics recycling) is a rapidly growing industry in the urban areas. The industry will likely continue to grow as we see an increase in the awareness of how these products are disposed of and as the length of their useful life decreases due to changes in technology.

Individual Waste Generation

Figure 5.10 illustrates an average of how each person in the state contributes to the municipal solid waste stream. These numbers are about 2 pounds per person above the national averages for the categories of disposal, recycling, and generation. The difference is accounted for by a different ferrous metal measurement by Washington and the relatively larger amounts of yard and wood waste than the national average. Along with county review and end-use information these numbers provide a good check for the state's recycling numbers. In 2001, each resident of the state generated 6.7 pounds of solid waste per day—4.2 pounds were disposed of, 2.1 pounds were recovered for recycling, and 0.4 pounds were recovered for composting (See Table 5.5).

Figure 5.10
Pounds Disposed of, Recycled, and Generated (Per Person/Day)

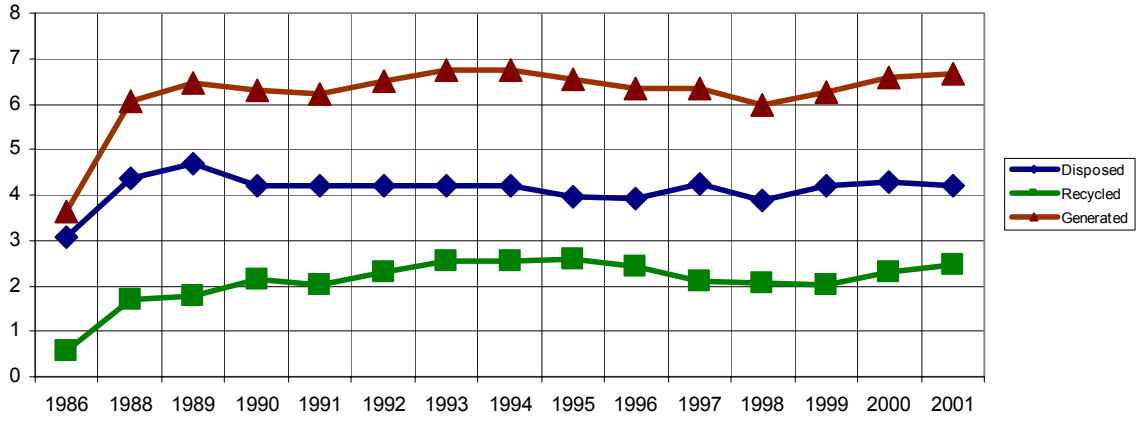


Table 5.5
Generation, Materials Recovery, Composting,
Waste Diversion, and Discards of Municipal Solid Waste
1986-2001

Pounds per person per day[10]										
	1986	1988	1990	1992	1994	1996	1998	1999	2000	2001
Generation	3.6	6.1	6.3	6.5	6.7	6.4	6.0	6.3	6.6	6.7
Recovery for Recycling	0.5	1.7	2.0	2.1	2.2	2.1	1.5	1.5	1.9	2.1
Recovery for Composting	Na	Na	0.1	0.2	0.3	0.3	0.6	0.5	0.4	.4
Recovery for Diversion[11]	Na	Na	Na	Na	Na	Na	Na	0.2	1.3	1.4
Total Materials Recovery	0.5	1.7	2.1	2.3	2.5	2.4	2.1	2.0	2.3	2.5
Discards After Recovery	3.1	4.4	4.2	4.2	4.2	3.9	3.9	4.2	4.3	4.2
Population (millions)	4.5	4.6	4.9	5.1	5.4	5.6	5.7	5.8	5.9	6.0

Benefits of Recycling

The public and media attention that issues such as energy conservation and greenhouse gas emissions have recently received has been much greater than the attention given to recycling. There are many parallels with how recycling relates to other environmental issues, and the goal in focusing on each one leads to a single desired outcome. Thus, we can hope to draw more attention to the necessity of recycling and how it contributes to a sustainable future by linking it with other issues of concern. For example, Figure 5.11 shows the energy savings from recycling as compared to disposal in landfills and virgin material production.

[10] Totals may not add due to rounding.
[11] Not included in Total Materials Recovery or Generation – shown for comparison only.

Figure 5.11
Comparison of Energy Use through Recycling and Disposal & Virgin Manufacturing (mil. Btu)[12]

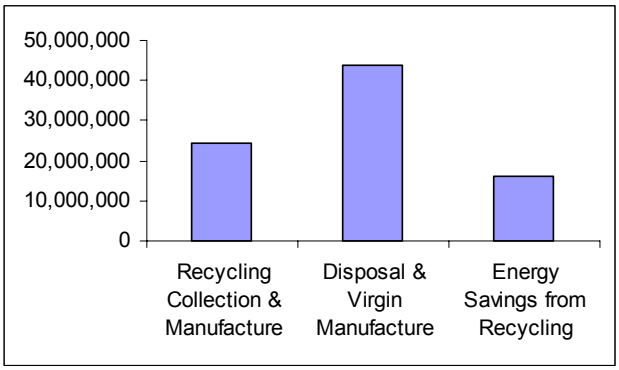


Table 5.6 shows some of the environmental benefits of recycling based on the actual tonnage of commodities diverted from Washington's waste stream in the year 2001 (as compared to using virgin materials). The energy saved from actual tons of material recycled in the state totaled 17,816,305 BTUs. The amount of greenhouse gases going into the atmosphere was reduced by 1,005,732 tons (MTCE). Please visit the Solid Waste & Financial Assistance Web site (topics related to sustainability) at http://www.ecy.wa.gov/programs/swfa/nav/sust.html for a link to the full document.

Table 5.6
Energy Savings and Greenhouse Gas Impacts from Recycling - 2001
Relative to energy required for virgin production[13]

Material/Grade	Tons Recovered[14]	BTUs Saved (in millions)	Tons Greenhouse Gases Reduced (MTCE)
Aluminum	12,540	1,900,687	49,007
Newsprint	176,392	1,693,021	111,369
Mixed Waste Paper	289,840	3,125,400	273,442
Cardboard	491,230	3,537,507	353,777
Glass	81,632	294,315	8,697
Steel Cans	11,483	256,882	6,426
Ferrous Metals	293,284	6,560,909	164,120
PET	4,661	133,123	3,122
HDPE	4,841	83,215	1,977
LDPE	6,603	161,332	3,553
Other Plastics	4,067	69,914	1,661
Food Scraps	86,226	N/A	1,815
Yard Waste	448,222	N/A	8,978
Other Organics[15]	887,999	N/A	17,788
Total	**2,799,020**	**17,816,305**	**1,005,732**

[12] Based on the NERC Environmental Benefits Model and the Washington State Department of Ecology 2001 Recycling Survey.
[13] Based on the NERC Environmental Benefits Model and the Washington State Department of Ecology 2001 Recycling Survey.
[14] This is a partial list of recyclables collected in 2001.
[15] Includes wood wastes, other wastes destined for composting and rendering.

In addition to greenhouse gases, recycling can reduce a range of pollutants from entering the air and water. This benefit accrues again because of reduced fossil fuel use and because recycled materials have already been processed once.

The environmental impact of recycling on the amount of wastes diverted from landfills and incinerators is a direct benefit for Washington state, in reducing the amount of leachate introduced into groundwater systems and reducing the amount of pollutants released into the air and water. Recycling diverted 4,266,773 tons of material from landfills and incinerators in 2001. This figure includes traditionally recycled materials, as well as those that have not been traditionally included, such as asphalt, concrete, and used oil burned for fuel. Recycling has been shown to produce less of 27 different types of air and water pollutants, compared with using virgin materials in manufacturing and disposing of wastes.[16] And, by substituting scrap materials for the use of trees, metal ores, minerals, oil, and other virgin materials, recycling reduces the pressure to expand forestry and mining production.

Diversion as a Measurement Option

Ecology has measured a very specific part of the solid waste stream since 1986. It is roughly the part of the waste stream defined as municipal solid waste by the Environmental Protection Agency.[17] However, Ecology has noted very large increases of recovery or beneficial use in "non-MSW" waste streams, most notable are the growing industries in recycling asphalt, concrete, and other construction, demolition, and landclearing debris.

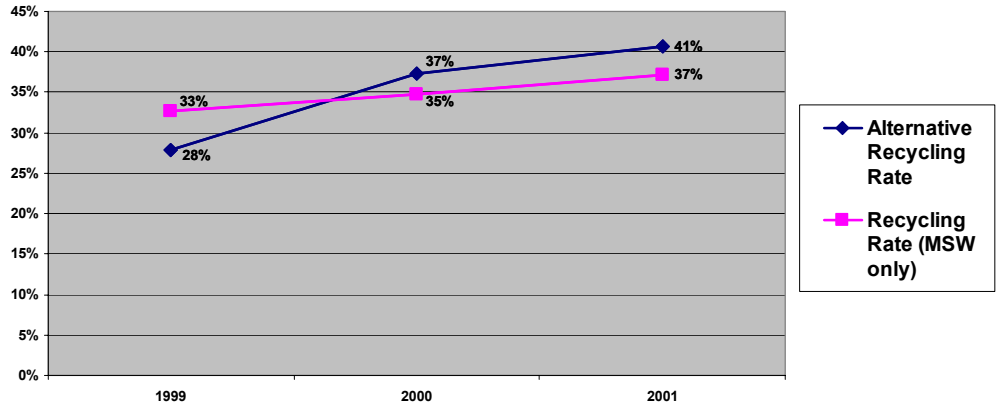
Increasingly, Washington counties and cities have been putting efforts into waste streams outside of the traditional municipal solid waste stream. The best example is for the construction and demolition waste streams. Many of these materials are now being recycled including asphalt, asphalt roofing shingles, concrete, road asphalt, dimensional lumber, various metals, and more. Knowledge of this waste stream is increasing. King County[18], the City of Seattle, and Clark County have all done sampling of this waste stream and have comparable results.

Wood is another large waste stream in Washington and an increasing percentage of it is being used in new wood and paper products and as a feedstock in composting operations and as mulch. In agriculture, waste materials are being composted and processed for land application as soil amendments. All of these uses of waste materials avoid disposal for more beneficial use.

[16] Based on information from sources including U.S. EPA, the Environmental Defense Fund, Franklin Associates, Ltd., the Tellus Institute, and the Steel Recycling Institute (Northeast Recycling Council).
[17] The recyclable portion of the waste stream is municipal solid waste as defined by the Environmental Protection Agency in the *Characterization of Municipal Solid Waste in The United States: 1996 Update*. This includes durable goods, nondurable goods, containers and packaging, food wastes, and yard trimmings. It does not include industrial waste, inert debris, asbestos, biosolids, petroleum contaminated soils, or construction, demolition, and landclearing debris disposed of at municipal solid waste landfills and incinerators.
[18] *Waste Monitoring Program: Construction, Demolition & Land Clearing Waste*, King County Solid Waste Division, January 1995.

SW&FAP has begun to include other types of materials in the recycling survey, and is calculating a recycling rate parallel to the traditional one, which includes non-MSW recyclables and non-MSW waste types such as inert, construction, demolition, and wood waste and tires. Washington shows an "alternative" recycling rate of 41% in 2001 (see Figures 5.12).

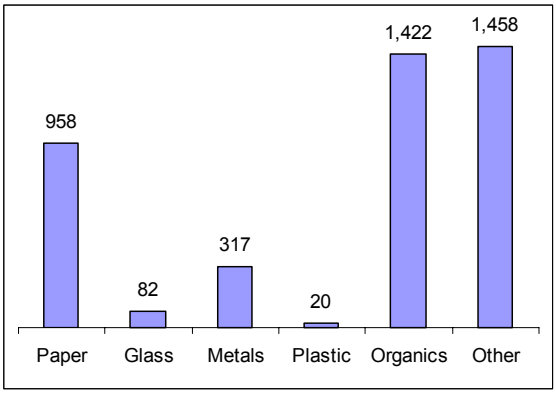
Figure 5.12
Alternative Recycling Rate Comparison 1999 to 2001
MSW versus All Waste Types[19]



Materials which require minimal or no processing for reuse, resale, or land application (in the case of organic materials) historically have been excluded from the definition of recycling for purposes of determining the recycling rate. The new solid waste rule, chapter 173-350 WAC, *Solid Waste Handling Standards,* will allow waste generators to apply for relief from solid waste permitting for the use of a waste as a substitute feedstock in a manufacturing or other industrial process or when used as a soil amendment. Until Ecology adopts a new definition of recycling, these activities which provide a beneficial use over landfill disposal or incineration, or perhaps even over recycling, will be counted as "diverted" material and calculated into an alternative recycling rate only. See Figure 5.13 for the amount of materials recycled and diverted for 2001.

[19] Includes Municipal, Demolition, Inert, Commercial, Wood, Tires, Medical, and Other Wastes. Excludes Industrial Wastes, Asbestos, Sludges, and Petroleum Contaminated Soils.

Figure 5.13
Amount of Materials Recycled (x 1,000 tons)
Including Recycling and Waste Diversion



SW&FAP maintains, however, that these wastes are not well characterized and there is no definitive information on the total volume of waste generated, especially in the industrial sector. The reporting requirement for solid waste recyclables does not include these beneficial use activities; therefore, respondents choose on a voluntary basis to report quantities handled. This lack of information makes it difficult to figure a recycling rate for many of these materials because either we don't know the total amount of waste generated or the beneficial use does not meet the state's definition of recycling.[20] For 1999, 2000, and 2001, the materials in Table 5.7 were reported.

Table 5.7
Reported Materials Not Included in the Recycling Survey
"Diverted" Materials

Material	1999 Tons	2000 Tons	2001 Tons
Antifreeze	1,329	2,475	4,157
Asphalt and Concrete	49,136	893,218	1,116,871
Asphalt Roofing Shingles	10,334	14,412	11,727
Bricks	12	N/A	N/A
Composting Furnish	N/A	89,678	91,495
Construction & Demolition Debris[21]	145,593	376,684	131,922
Household Batteries	23	39	38
Incinerator Ash	N/A	N/A	12,015
Industrial Batteries	41	738	N/A
Landclearing Debris	N/A	N/A	151,464
Miscellaneous	N/A	374	16
Oil Filters	1.4	835	5,942
Oyster Shells	1,563	N/A	N/A
Paint	N/A	40	87
Railroad Ties	N/A	121	12,460
Rebound Carpet Pad	18	97	820
Reuse - Clothing & Household Items	N/A	524	601
Reuse - Construction & Demolition Items	N/A	1,257	1,975

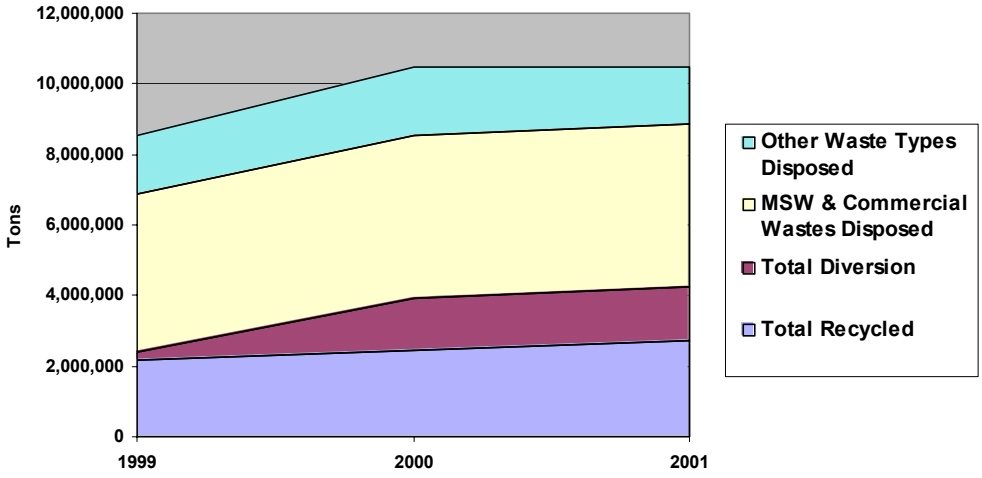
[20] Revised Code of Washington 70.95.030 (16) "Recycling" means transforming or remanufacturing waste materials into usable or marketable materials for use other than landfill disposal or incineration
[21] Includes landclearing debris in 1999 and 2000.

Material	1999 Tons	2000 Tons	2001 Tons
Reuse - Miscellaneous	N/A	198	334
Sweepings and Grit Used in Asphalt	N/A	10,000	318
Tires (reused, retread or burned for fuel)	N/A	N/A	1,009
Topsoil	N/A	22,812	N/A
Used Oil for Energy Recovery	6,256	33,021	19,786
Total Diverted	**214,306**	**1,446,522**	**1,563,035**

The methodology for measuring these diverted materials is as simple as collecting the number of tons of material that are going to beneficial use as opposed to disposal. Many recycling survey respondents have voluntarily listed this information on the recycling survey in the past, and beginning in 2000, the information was more specifically requested. SW&FAP will continue to collect more of this information on future surveys. For the most part, these materials are collected and processed outside of the traditional residential and commercial waste stream and were not well addressed in the Waste Not Washington Act of 1989. Still, SW&FAP recognizes the creative efforts of local governments and businesses in addressing these wastes. This is not an exhaustive list, neither are the numbers complete for these material categories.

Figure 5.14 illustrates the Washington state waste generation rate as calculated from the amount of waste recycled, diverted and disposed. As better reporting of information for recycling, diversion and disposal occurs in the next few years, the generation number will become more accurate.

Figure 5.14
Washington Waste Generation[22]
Including Waste "Diversion"
1999 to 2001



[22] Other waste types includes demolition, inert, wood, tires, medical waste and other wastes. It excludes industrial wastes, asbestos, sludges, petroleum contaminated soils.

Chapter VI. Disposal of Solid Waste in Washington

One of the goals of this report is to identify the types and quantities of solid waste disposed in the various types of landfills and energy recovery facilities in the state. This includes waste imported into the state for disposal and waste exported to Oregon.

Landfilling is the basic method of final disposal and includes five types of landfills - municipal solid waste landfills, woodwaste landfills, limited purpose landfills, inert/demolition landfills and ash monofills.

As part of the annual reporting requirements of chapter 173-304 WAC, *the Minimum Functional Standards (MFS)* and chapter 173-351*, Criteria for Municipal Solid Waste Landfills*, forms were sent to the various types of landfills for them to report the types and quantities of waste they received for disposal. The categories of solid waste specified on the form were municipal, demolition, industrial, inert, commercial, woodwaste, sewage sludge, asbestos, petroleum contaminated soils, tires, special waste and other. The facilities were also asked to report the source of their waste: out-of-county, out-of-state or out-of-country.

In addition, three landfills in Oregon accept waste from Washington, Finley Butte, Wasco and Columbia Ridge. Waste information from each facility is used in preparing this report.

The other method of waste disposal in Washington is energy-recovery facilities. Annual report forms were also sent to these facilities. The same type of waste information was requested.

Municipal Solid Waste Landfills

Amount of Waste Disposed in Municipal Solid Waste Landfills

In 2001, 20 municipal solid waste landfill accepted waste totaling 4,525,019 tons.[23] Of the 20 landfills, 14 were publicly owned, and six were privately owned.

Six of the 20 landfills received over 100,000 tons of waste in 2001. The two largest landfills in Washington, Cedar Hills in King County and Roosevelt Regional Landfill in Klickitat County received 939,506 tons and 1,836,114 tons, respectively. In 2001, only one landfill received less than 10,000 tons, compared with 12 MSW landfills in 1994. This trend (Figure 6.1) indicates that the smaller facilities have been closing in response

[23] Throughout this report, different disposal amounts are discussed. These numbers vary based on the types of facilities being discussed, the source of the waste and the purpose of the discussion. For example, the recycling survey only accounts for "traditional" municipal waste in the disposed amount used to calculate the statewide recycling rate. See discussions in Chapter V and this chapter for further information.

to more stringent regulations and some are reaching the limits of their capacity and are not planning on expanding.

Figure 6.1
MSW Landfill Size
(Number of Landfills Based on Disposed Tons Per Year)

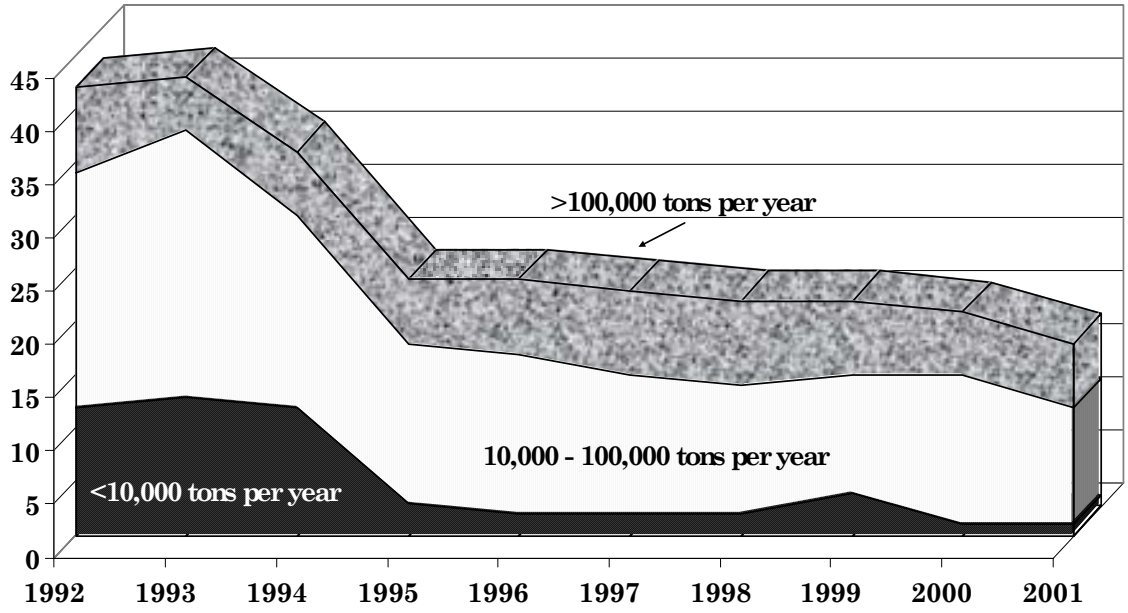


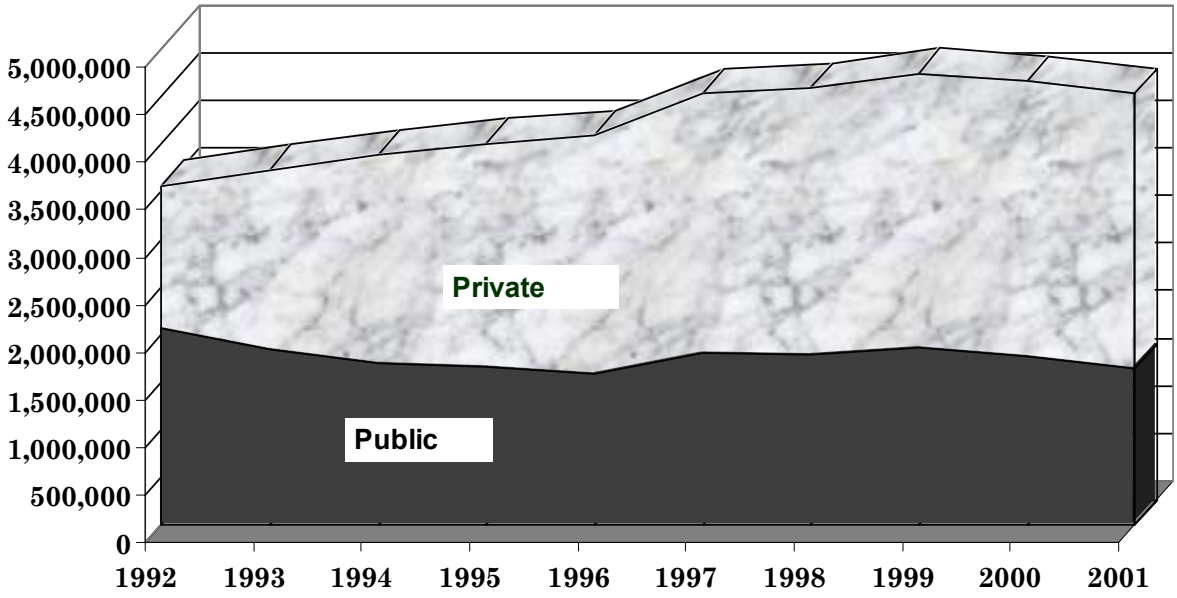
Table 6.1 shows the relationship of waste disposed to public/private ownership. As the table illustrates, 1,637,203 tons of solid waste disposed went to publicly owned facilities (36%), with the remaining 2,887,816 tons going to private facilities (64%).

Table 6.1
Waste Disposed in MSW Landfills – Public/Private

OWNERSHIP	NUMBER OF MSW LANDFILLS		AMOUNT OF WASTE DISPOSED (Tons)		% TOTAL WASTE DISPOSED	
	1991	2000	1991	2001	1991	2001
PUBLIC	36	14	2,696,885	1,637,203	69	36
PRIVATE	9	6	1,192,207	2,887,816	31	64
TOTAL	45	2	3,889,092	4,525,019	100	100

The amount of waste disposed in MSW landfills shows movement from the publicly owned facilities to those owned by the private sector (see Figure 6.2). The trend has continued since 1991, when the state first started tracking this type of information. The amount of waste disposed in the private facilities has increased from 31% since 1991 to 64% in 2001. The majority of this increased amount can be accounted for by the private Roosevelt Regional Landfill in Klickitat County.

Figure 6.2
Comparison of Waste Disposed for Public and Private Facilities (tons)



Types of Waste Disposed in Municipal Solid Waste Landfills
Traditionally, many people think of the waste disposed in MSW landfills as being mostly household waste.[24] Annual facility reports show that a much wider variety of waste is disposed of in the MSW landfills. These wastes need to be considered in terms of remaining available capacity. Fourteen of the 20 landfills reported a significant amount of solid waste disposed, other than municipal solid waste. Demolition, industrial, inert, commercial, woodwaste, sludge, asbestos, petroleum contaminated soils (PCS) and tires were the major waste streams. (A few landfills report all types of waste under the general "municipal" category so exact amounts cannot be determined.) Table 6.2 shows changes in waste, types and amounts disposed in MSW landfills from 1995 through 2001. (See Appendix C, Table C.1 for specific 2001 MSW facility data and Appendix D, Table D.1 for MSW landfill data from 1992-2001).

[24] "Household waste" as defined in chapter 173-351 WAC, *Criteria for Municipal Solid Waste Landfills*, means any solid waste (including garbage, trash, and sanitary waste in septic tanks) derived from households (including single and multiple residences, hotels and motels, bunkhouses, ranger stations, crew quarters, campgrounds, picnic grounds, and day-use recreation areas).

Table 6.2
Waste Types Reported Disposed in MSW Landfills

WASTE TYPES	1995 (Tons)	1996 (Tons)	1997 (Tons)	1998 (Tons)	1999 (Tons)	2000 (Tons)	2001 (Tons)
Municipal Solid Waste*	2,777,030	2,807,998	3,083,286	3,222,639	3,421,415	3,336,745	3,432,359
Demolition Waste	382,513	375,412	385,412	446,172	437,005	569,239	373,254
Industrial Waste	161,779	145,617	163,431	159,781	232,905	88,841	201,198
Inert Waste	5,154	30,061	117,512	107,452	23,875	19,349	26,376
Commercial Waste	142,258	109,093	173,863	158,256	129,070	93,752	66,391
Woodwaste	37,850	57,667	57,128	60,383	68,889	47,087	34,254
Sewage Sludge	66,728	49,205	72,741	67,419	62,920	47,783	1,473
Asbestos	7,859	7,965	9,558	10,684	9,666	7,922	5,991
Petroleum Contaminated Soils	255,288	254,414	444,260	288,407	312,247	231,290	217,721
Tires	28,712	12,787	14,912	19,130	12,581	43,188	8,567
Special	na	10	6	904	0	437	917
	na	na	na	na	na	239	387
Other**	136,644	233,526	10,809	40,880	28,235	173,711	156,131
TOTAL	4,001,815	4,083,755	4,532,918	4,582,107	4,738,808	4,659,582	4,525,019

* Some facilities include demolition, industrial, inert, commercial and other small amounts of waste types in the MSW total.

** Some of the "other" types of waste reported include non-municipal ash, auto fluff and white goods.

In reviewing the types of waste that were disposed in the MSW landfills in 2001, increased amounts were reported for the categories of municipal solid waste, industrial waste and inert waste. There was a decrease in demolition, PCS, tires and the "other" categories.

Waste-to-Energy/Incineration

Four waste-to-energy facilities/incinerators statewide burned 496,152 tons of solid waste. Of that amount, 9,072 tons were identified as woodwaste at the Inland Empire Paper facility in Spokane and 3,938 tons of woodwaste at the Ponderay Newsprint Company in Pend Oreille County. These two incinerators do not burn municipal solid waste. In 2001, almost 10% of solid waste was incinerated statewide. The highest percent of waste incinerated in the state was 12% in 1995. (See Appendix C, Table C.2 for facility specific 2001 energy recovery/incinerator data.)

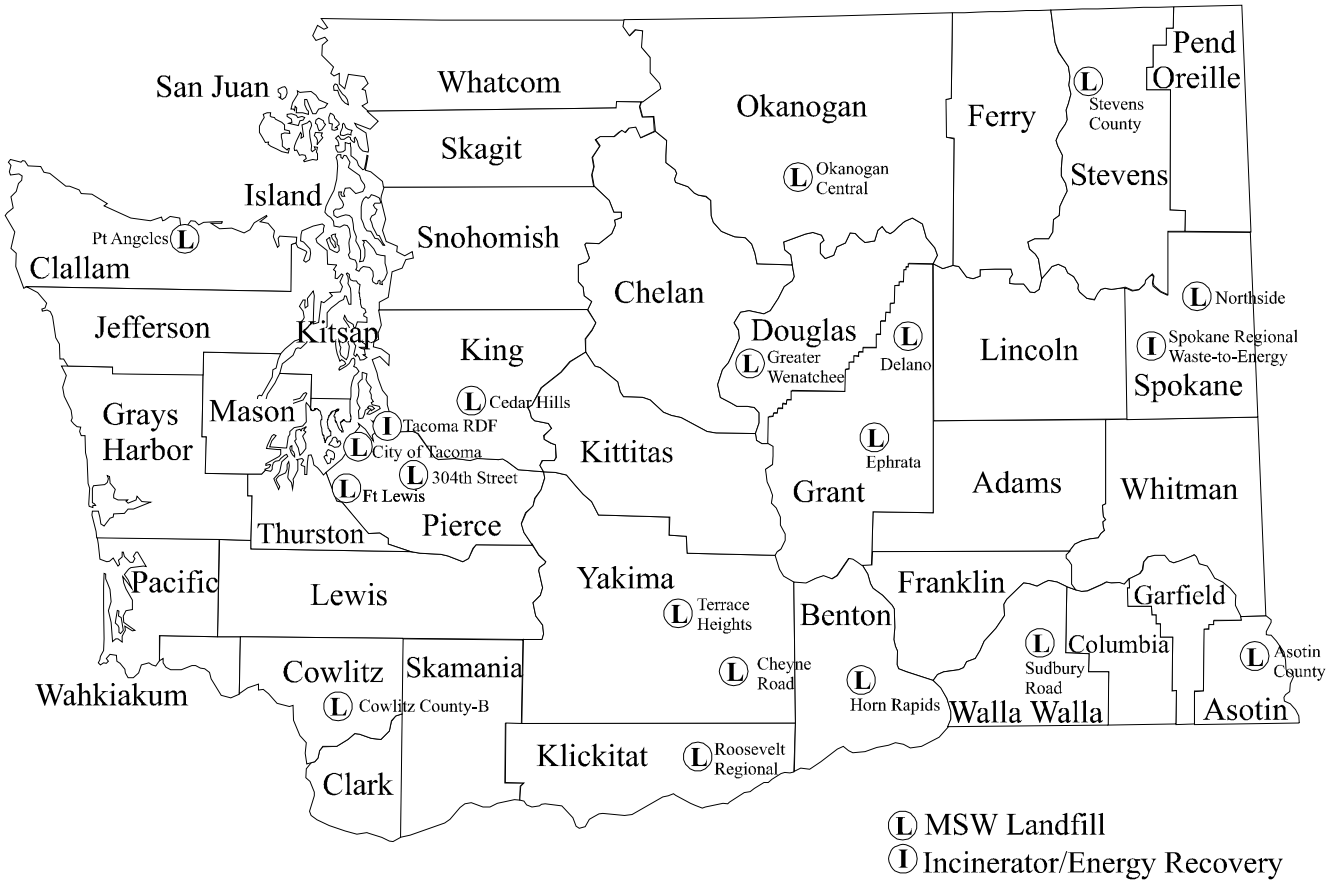
Ash Monofill

For waste-to-energy facilities or incinerators that are regulated by chapter 173-304 WAC, *the Minimum Functional Standards for Solid Waste Facilities*, and chapter 173-306 WAC, *Special Incinerator Ash Management Standards* (see in Chapter II), the ash generated must be disposed in a properly constructed ash monofill. In 2001, there was one energy recovery/ incinerator that met this criteria. The municipal solid waste incinerator ash (76,523 tons) was disposed at the ash monofill at the Roosevelt Regional Landfill in Klickitat County.

Trends in Municipal Solid Waste Disposal Methods

The two basic ways to dispose of solid waste are landfilling and burning. (See Map A for the location of MSW landfills and energy recovery facilities.)

Map A: Location of MSW Landfills & Energy Recovery Facilities (as of October 2002)



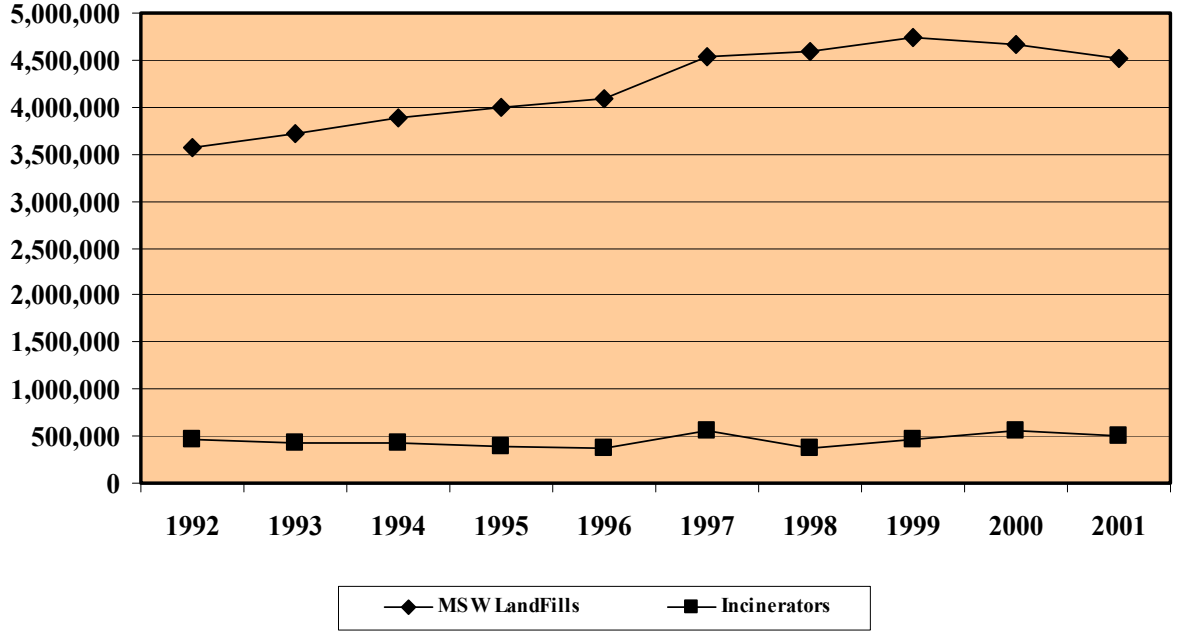
A comparison of the amount of solid waste disposed in municipal solid waste landfills and waste-to-energy facilities and incinerators in 2001 is shown in Table 6.3.

Table 6.3
Waste Disposed in MSW Landfills and Incinerators in 2001

FACILITY TYPE	TONS	PERCENT (%)
MSW Landfills	4,525,019	90%
Incinerators	496,152	10%
TOTAL	5,021,171	100%

The largest change in disposal methods over the past few years has been between landfilling and energy recovery/incineration. In 1991, 98% of the waste was disposed in MSW landfills and 2% was incinerated. The highest percent of incinerated waste in the state, 12%, occurred in 1995. The rate has varied between 9 and 11% since 1998. (See Figure 6.3)

Figure 6.3
Comparison of Solid Waste Landfilled & Incinerated 1991 through 2001 (in tons)



The amount of waste incinerated will likely remain fairly stable, with only one operating municipal solid waste energy-recovery facilities, one energy recovery facility inactive at this time and no new facilities planned.

Inert/Demolition, Limited Purpose and Woodwaste Landfills

In addition to municipal solid waste landfills, there are currently three other types of landfill types in the state: inert/demolition, limited purpose, and woodwaste. These are regulated under chapter 173-304 WAC, the *Minimum Functional Standards for Solid*

Waste Handling (MFS). With the completion of chapter 173-350 WAC, *Solid Waste Handling Standards* in January 2003, the classification and requirements for these types of landfills will change. There will no longer be woodwaste landfill or inert/demolition landfill categories. Inert waste will be narrowly defined for disposal in an inert landfill. Demolition waste will no longer be accepted at an inert landfill. The limited purpose landfill category will remain with increased design and monitoring requirements.

For 2001, annual report forms were received from the inert/demolition, limited purpose and woodwaste landfills. Tables 6.4 - 6.6 identify the types and quantities of waste received at these landfills.

Table 6.4 includes the waste types and amounts reported by 33 inert/demolition landfills for 2001. There was a large increase in petroleum contaminated soils. Some facilities may be over-reporting disposal numbers since much of the material coming on-site is being recycled, for example as aggregate. SW&FAP will be gathering additional information in the future to better distinguish disposal versus recycling tonnages at some of these facilities. (See Appendix C, Table C.3 for 2001 facility specific inert/demolition landfill data and Appendix D Table D.2 for inert/demolition landfill data from 1992-2001).

Table 6.4
Waste Types and Amount Disposed at Inert/Demolition Landfills

WASTE TYPES	1995	1996	1997	1998	1999	2000	2001
Municipal	0	0	0	0	0	0	0
Demolition	103,903	133,469	262,793	180,268	173,088	259,255	211,901
Industrial	0	0	121	0	0	0	0
Inert	121,943	226,362	326,331	252,506	344,444	180,337	199,256
Commercial	0	0	0	0	0	0	0
Wood	167	39	0	156	336	536	167
Sludge	0	0	0	0	0	0	0
Asbestos	0	0	0	4	0	3	3
PCS	18,295	846	10,285	60,545	17,265	34,742	319,105
Tires	0	33	618	449	414	471	765
Other	33,125	58,953	1	600	605	2,039	2,646
TOTAL (tons)	277,433	419,702	600,149	494,528	536,155	477,383	733,843

Table 6.5 includes the types and amounts of waste reported disposed at 13 limited purpose landfills for 2001. There were increases in demolition, industrial, PCS, wood and tires and a small decrease in inert, asbestos, other and the overall total. (See Appendix C, Table C.4 for 2001 facility specific limited purpose landfill information data and Appendix D Table D.3 for limited purpose landfill data from 1992-2001).

Table 6.5
Waste Types and Amount Disposed at Limited Purpose Landfills

WASTE TYPES	1995	1996	1997	1998	1999	2000	2001
Municipal	0	0	0	0	0	0	0
Demolition	151,230	180,529	85,916	98,072	84,140	71,203	71,817
Industrial	315,930	371,496	277,419	225,779	262,021	278,224	325,114
Inert	138,577	141,759	109,174	112,714	136,352	205,902	202,577
Commercial	0	0	0	0	0	0	0
Wood	58,628	22,660	14,589	7,700	8,853	3,205	6,841
Sludge	0	0	2,275	0	1,103	0	0
Asbestos	797	512	1,310	1,058	1,549	1,654	1,282
PCS	148,932	98,221	121,066	56,407	8,837	7,159	13,222
Tires	0	29,227	434	559	59	25	41
Other	40,797	65,675	83,600	124,607	66,833	79,291	24,698
TOTAL (tons)	874,116	910,078	695,783	628,896	569,747	646,662	645,592

Table 6.6 includes the waste types and amounts reported at one woodwaste landfill for 2001. Most woodwaste landfills have closed. A high demand for wood products has increased the reuse and recycling of woodwastes that had been disposed in the past. Some woodwaste landfills are actually "mining" materials disposed in the past. These operations will be evaluated further to determine how to more accurately determine the amount of material disposed. With only one woodwaste landfill still operating, there was a decrease all categories. (See Appendix C, Table C.5 for 2001 facility specific woodwaste landfill data and Appendix D Table D.4 for woodwaste landfill data from 1992-2001).

Table 6.6
Waste Types and Amount Disposed at Woodwaste Landfills

WASTE TYPES	1995	1996	1997	1998	1999	2000	2001
Municipal	0	0	0	0	0	0	0
Demolition	8,600	18,780	17,718	21,313	25,121	32,182	31,559
Industrial	0	0	0	0	0	15,120	0
Inert	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0
Wood	105,080	81,886	69,498	36,777	75,668	33,452	21,739
Sludge	0	0	0	0	0	0	0
Asbestos	0	0	0	0	0	0	0
PCS	0	0	0	0	0	0	0
Tires	0	0	0	0	0	0	0
Other	2,079	2,031	8,109	1,320	1,695	622	0
TOTAL (tons)	115,759	102,697	95,325	59,410	102,484	87,552	53,298

Movement of Solid Waste

Movement of Waste Between Counties

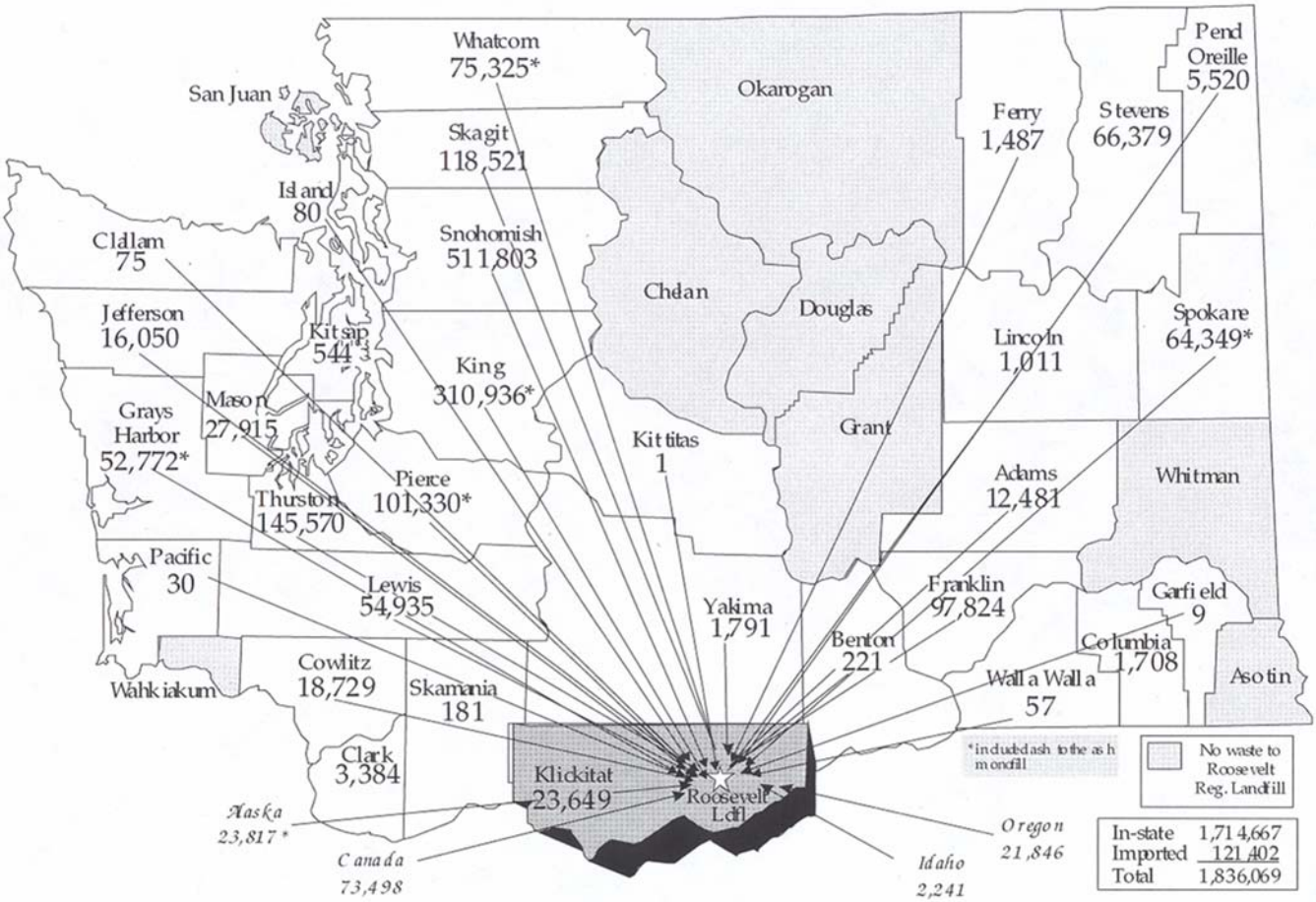
All landfills and incinerators were asked to report the source, types and amounts of waste they received from out-of-county. Seven of the 20 active MSW landfills reported receiving over 1.8 million tons of solid waste from other counties in 2001.

Some of the municipal solid waste movement was because of closer proximity to a neighboring county's landfill, especially for the smaller landfills which received municipal waste from other counties without there own landfills. Some of the waste disposed from other counties was non-municipal waste such as PCS, demolition and asbestos.

With the closure of many local landfills, Roosevelt Regional Landfill in Klickitat County, and to a lesser extent, Oregon's regional landfills, have become the chosen disposal option. The Roosevelt Regional Landfill received some type of solid waste from 32 of the 39 Washington counties and also from out-of-state and out-of-country (see Map B). For many counties that still have operating MSW landfills, Roosevelt Regional Landfill has become an option to dispose of some of their non-municipal waste, thus saving local landfill capacity for future need. Thirteen of the 32 counties rely on Roosevelt for the majority of their MSW waste disposal and four other counties send a significant portion of their MSW to Roosevelt. Six counties and the City of Seattle send the majority of their MSW waste to Oregon facilities. Two other counties send a significant amount of waste to Oregon.

In addition to waste movement to MSW landfills, two of the waste-to-energy facilities received 9,722 tons of waste (MSW and demolition) from beyond their home county. Six inert/demolition landfills received 224,766 tons of waste (inert, demolition and PCS) and three limited purpose landfills received 27,359 tons of waste (asbestos, inert, demolition and PCS) from other counties. One woodwaste landfill received 3,800 tons of demolition waste from other counties.

Map B: 2001 Solid Waste to Roosevelt Regional Landfill (in Tons)



Waste Imported from Outside the State

Washington state landfills and incinerators were also asked to report the source, types and amounts of waste received from out-of-state or out-of-country. In 2001, a total of 172,696 tons of solid waste, about 3% of the waste disposed and incinerated in Washington, was imported from beyond the state's boundaries for disposal at municipal solid waste landfills and energy recovery facilities. The amount of waste imported for disposal decreased from a high of 6% in 1996. Accounting for much of the drop in imported waste was the termination of a contract between Roosevelt Regional Landfill and a California entity.

The types of waste received from out-of-state for disposal are shown in Table 6.7. The majority of this waste (121,403 tons) went to Roosevelt Regional Landfill. Of that 73,499 tons were imported from Oregon, with the remainder from Alaska, Idaho and Canada.

Table 6.7
Out-of-State Waste Disposed in Washington

TYPE OF WASTE	QUANTITY (TONS)		
	1991	2000	2001
Municipal Solid Waste	24,475	116,365	100,092
Demolition	1,412	25,322	4,370
Industrial	0	32,044	57,952
Woodwaste	208	21	2
Sludge	36	0	0
Asbestos	0	715	243
Petroleum Contaminated Soils	0	1,511	4,910
Tires	0	2,296	1,622
Medical	na	0	0
Other	0	3,131	33
TOTAL	26,131	191,405	172,696

Nez Perce County, Idaho, disposed of approximately 24,000 tons of MSW in the Asotin County Landfill. This disposal is considered incidental movement because Asotin County, Washington, and Nez Perce County, Idaho, prepared a joint local comprehensive solid waste management plan to meet the requirements of Washington state statute and have an agreement for joint use of the landfill.

In addition to the MSW landfills, two incinerators received 3,472 tons of demolition waste from Oregon and Idaho. Two limited purpose landfills imported a total of 22,624 tons of waste from Oregon, Idaho and Montana. The Weyerhaeuser limited purpose landfill in Cowlitz County received most of this waste (20,207 tons). One inert/demolition landfill received 1,197 tons of inert/demolition waste from Idaho.

Waste Exported from the State

Another aspect of solid waste movement is the amount exported from Washington to another state for disposal. In 2001, a total of 1,175,953 tons of waste generated in Washington was disposed in Oregon landfills, an increase from 705,608 tons in 1992. Table 6.8 compares the waste amounts and types exported and imported. (See Appendix D Table D.5 for imported totals for 1991-2001 and Table D.6 for exported totals 1993-2001.)

Table 6.8
Comparison of Imported-to-Exported Waste for all Solid Waste Facilities

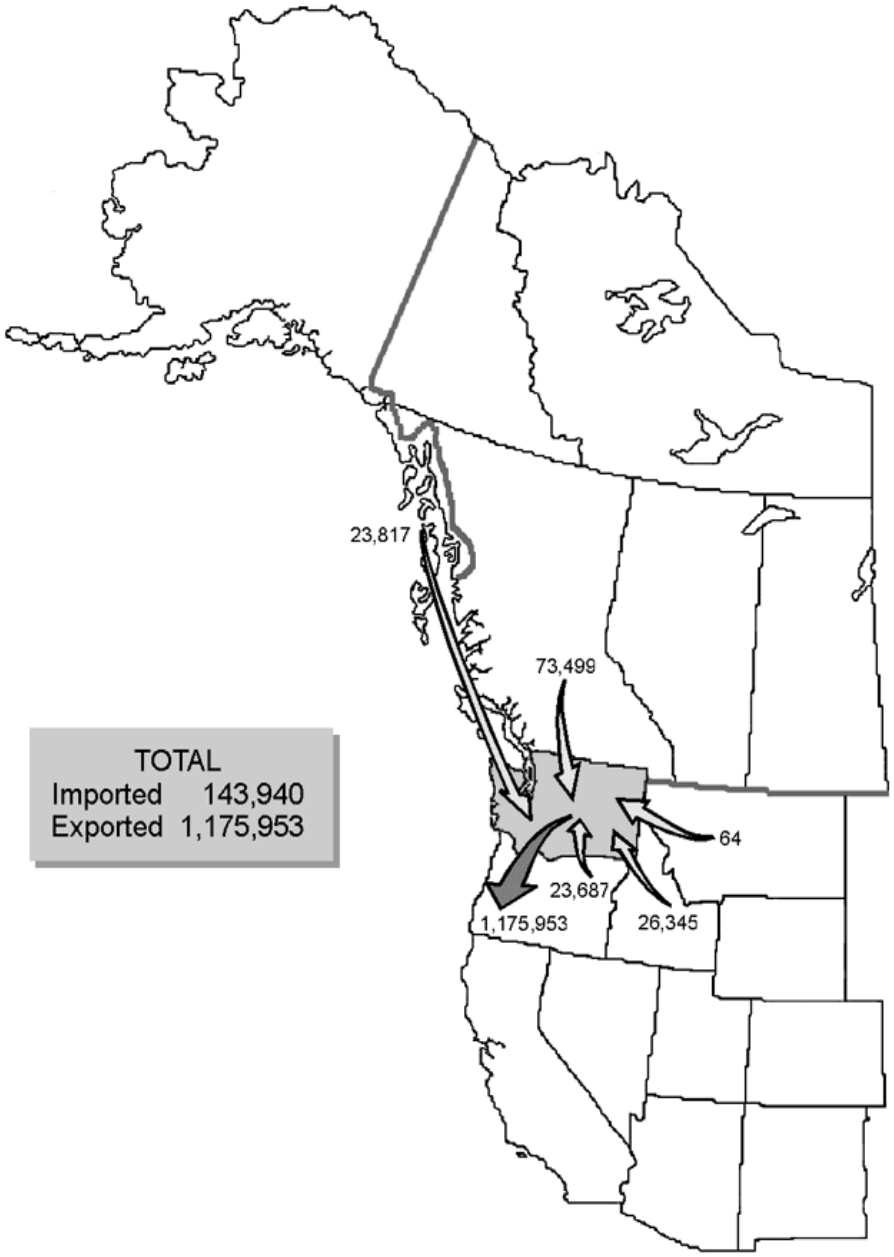
TYPE OF WASTE	IMPORTED		EXPORTED	
	2000	2001	2000	2001
Municipal Solid Waste	116,365	100,092	949,685	915,156
Demolition	25,322	4,370	93,540	62,791
Industrial	32,044	57,952	129,986	115,334
Woodwaste	21	2	0	0
Sludge	0	0	0	0
Asbestos	715	243	4,439	3,836
Petroleum Contaminated Soils	1,511	4,910	54,787	71,460
Tires	2,296	1,622	0	0
Medical Waste	0	0	6,109	4,868
Other	3,131	33	1,939	1,919
TOTAL	191,405	172,696	1,240,485	1,175,953

Major exporters of municipal solid waste in Washington included the City of Seattle (474,690 tons of MSW), Clark County, Island County, Pacific County, San Juan County, Skamania County, Whitman County, and a portion of Benton County, Pierce County, Snohomish County and Whatcom County. Reasons for exportation out-of-state are related to the closure of local landfills, and negotiation of favorable long-haul contracts.

Trends in Interstate Waste Movement for Washington

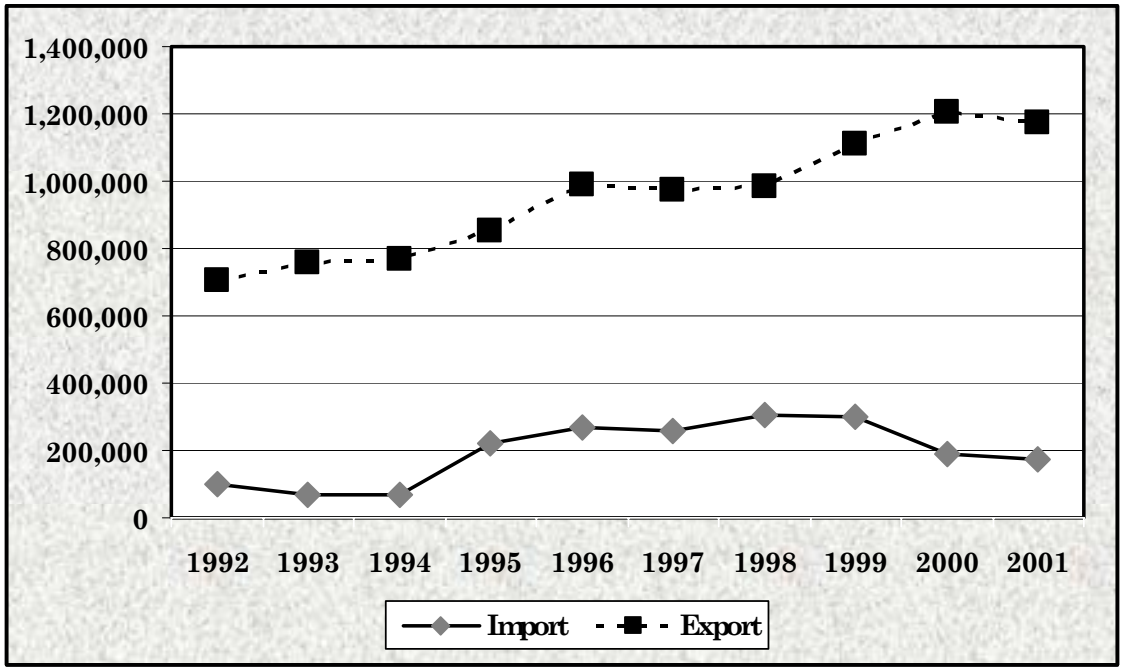
The first significant movement of waste across Washington state boundaries started in 1991. In mid-1991, the City of Seattle started long-hauling waste to the Columbia Ridge Landfill in Arlington, Oregon. In late 1991, the Roosevelt Regional Landfill began operating in Klickitat County, Washington, accepting waste from British Columbia, Idaho, and Oregon. Map C identifies the sources and amounts of waste that were imported and exported in 2001.

Map C: Imported and Exported Waste (2001)



As can be seen in Figure 6.4, Washington exports have been much higher than imports since 1991. With the loss of the California contract at Roosevelt Regional Landfill, waste imports dropped from a high of 307,850 in 1998, to 172,696 tons in 2001. Exported waste amounts decreased slightly in 2001, with almost seven times as much waste being exported to Oregon's landfills, Columbia Ridge, Wasco and Finley Buttes, than is imported to Washington for incineration or disposal.

Figure 6.4
Trend of Imported/Exported Solid Waste



Determining the Amount of Solid Waste Disposed

The figure arrived at for the amount of solid waste disposed varies depending upon the types of wastes included, the source of waste generation or the types of facilities included in the calculation.

Waste Generated by Washington Citizens for Disposal at MSW Facilities

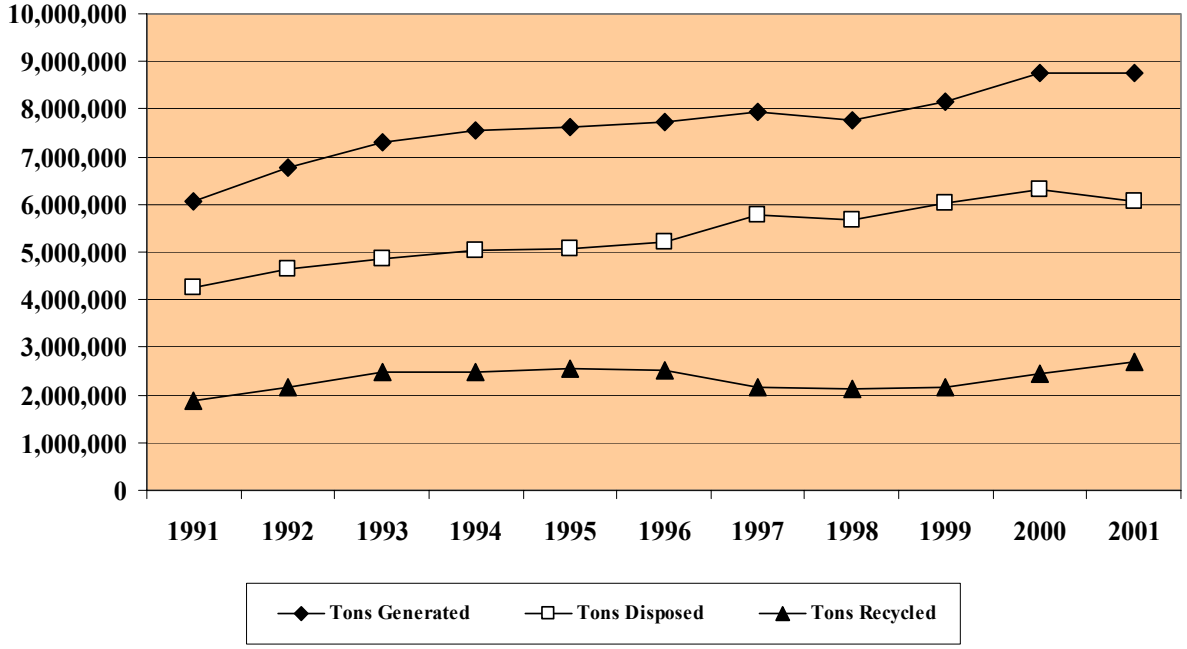
Since 1987, Ecology has conducted a recycling survey that has reported the amount of waste generated, recycled and disposed each year. This waste stream was the "recyclable waste stream" made up of waste types included in the recycling categories, but not including sludge, asbestos, petroleum contaminated soils, construction and demolition, or industrial waste (when it could be specifically identified[25]). It was also typically the waste stream generated and reported by municipalities (cities and counties). The report for the recycling survey included waste that was disposed of outside of Washington, but excluded imported waste.

Figure 6.5 shows the amount of waste recycled, disposed and generated in Washington. It is based on waste disposed at MSW landfills and incinerators in Washington and Oregon, excluding imported waste. All types of waste are included in the disposal

[25] Some facilities and government entities that report information for the annual recycling survey on waste generated and disposed include other waste in with the total for municipal solid waste. These waste types are typically inert, demolition, industrial, and commercial.

numbers. The trend until 1997 showed an increase in the amounts generated, recycled, and disposed. The recycling rate remained fairly flat from 1997 to 1999. In 2001, there was an increase in the recycling rate, along with a decrease in the disposal rate.

Figure 6.5
Washington State Trends in Solid Waste
Generated, Recycled & Disposed (in tons)



Washington State's population has continued to grow since disposal numbers were tracked in 1991 (see Table 6.9). The increased population has had a correlated increase in waste disposed. In 1995, the per capita disposal rates (0.93 tons/person/year) decreased from the 1994 level (0.94 tons/person/year). The rate began to rise in 1997 to a high of 1.09 tons in 2000. There was also a significant decrease in the recycling rate per person, from 0.47 tons/person/year in 1995 to 0.38 tons/person/year in 1997. In 2001, there was a decrease in the per capita disposal rate to 1.01 tons/person/year. There was also an increase in the recycling rate to 0.45 tons/person/year.

Table 6.9
Washington State Population

1991	5,000,385
1992	5,116,685
1993	5,240,900
1994	5,334,400
1995	5,429,900
1996	5,516,800
1997	5,606,800
1998	5,685,300
1999	5,757,400
2000	5,803,400
2001	5,974,900

Figure 6.6 analyzes the trends in per capita generation, recycling and disposal. This looks at the number of tons per year generated, recycled and disposed by each person. The total is not what each person produces at each household, but includes all residential, business, commercial and industrial waste generated in the state that is disposed of in municipal solid waste landfills and incinerators. Table 6.10 shows the per capita numbers (pounds/person/day) from 1995 through 2001. (See Appendix D Table D.7 for per capital numbers from 1991-2001.)

Figure 6.6
Washington State Trends in Solid Waste
Generated, Recycled & Disposed (tons/person/year)

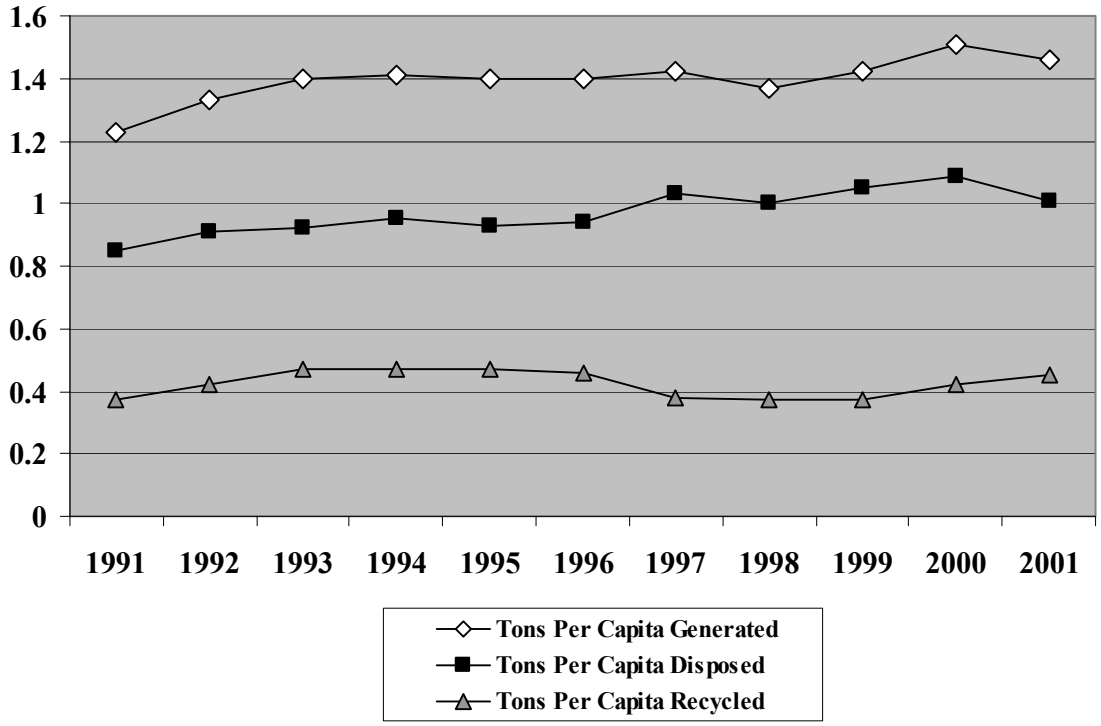


Table 6.10
Per Capita Disposed, Recycled and Generated Numbers
(pounds/person/day)

Per Capita	1995	1996	1997	1998	1999	2000	2001
Disposed[26]	5.12	5.16	5.66	5.45	5.73	5.96	5.55
Recycled	2.56	2.51	2.10	2.05	2.05	2.33	2.48
Generated	7.68	7.67	7.76	7.50	7.78	8.28	8.03

While the overall total of waste has decreased, the municipal solid waste portion of the waste stream has increased. Traditional recycling commodities (glass, paper, etc.) have decreased while the recycling of wood has shown an increase. There was a corresponding decrease in the amount of wood reported disposed at the various landfill types. The revised state solid waste plan, Beyond Waste, a draft to be completed in Fall 2003, will provide the vision for reducing the amount and impact of waste and will focus efforts on waste prevention and reduction by state and local government, the private sector, and citizens of the state.

Total Waste Disposed in Washington State

The three other categories of landfills for which information was obtained this year include woodwaste, inert/demolition and limited purpose. The waste disposed in these facilities is more typically generated by the private sector (business and industry). There is a significant amount of waste that is disposed of in-state that is not included in the disposal numbers discussed above.

To gain a more complete picture of solid waste disposal in the state, it is necessary to include all categories of waste that are disposed or incinerated in Washington state landfills and incinerators. This includes waste imported from out-of-state, but does not include exported waste. When all categories are included, 6,453,904 tons of waste were disposed of in all types of landfills and incinerators in Washington in 2001 (see Table 6.11). (See Appendix D Table D.8 for total solid waste disposed from 1993-2001.)

Table 6.11
Total Amounts of Solid Waste Disposed in Washington

DISPOSAL METHOD	1995	1996	1997	1998	1999	2000	2001
Municipal Solid Waste Landfills	4,001,815	4,083,755	4,532,918	4,582,107	4,738,808	4,659,582	4,525,019
Incinerated Waste	397,588	365,464	551,006	369,778	461,684	554,780	496,152
Woodwaste Landfills	115,759	102,697	95,325	59,410	102,484	87,552	53,298
Inert/Demolition Landfills	479,638	873,195	600,149	494,528	536,155	477,383	733,843
Limited Purpose Landfills	874,116	910,078	695,783	628,896	569,747	646,662	645,592
TOTAL	5,868,916	6,335,189	6,475,181	6,134,719	6,408,878	6,425,959	6,453,904

[26] Disposed amounts include all waste generated from Washington disposed in MSW landfills and incinerators, both instate and exported.

Future Capacity at Municipal Solid Waste Landfills

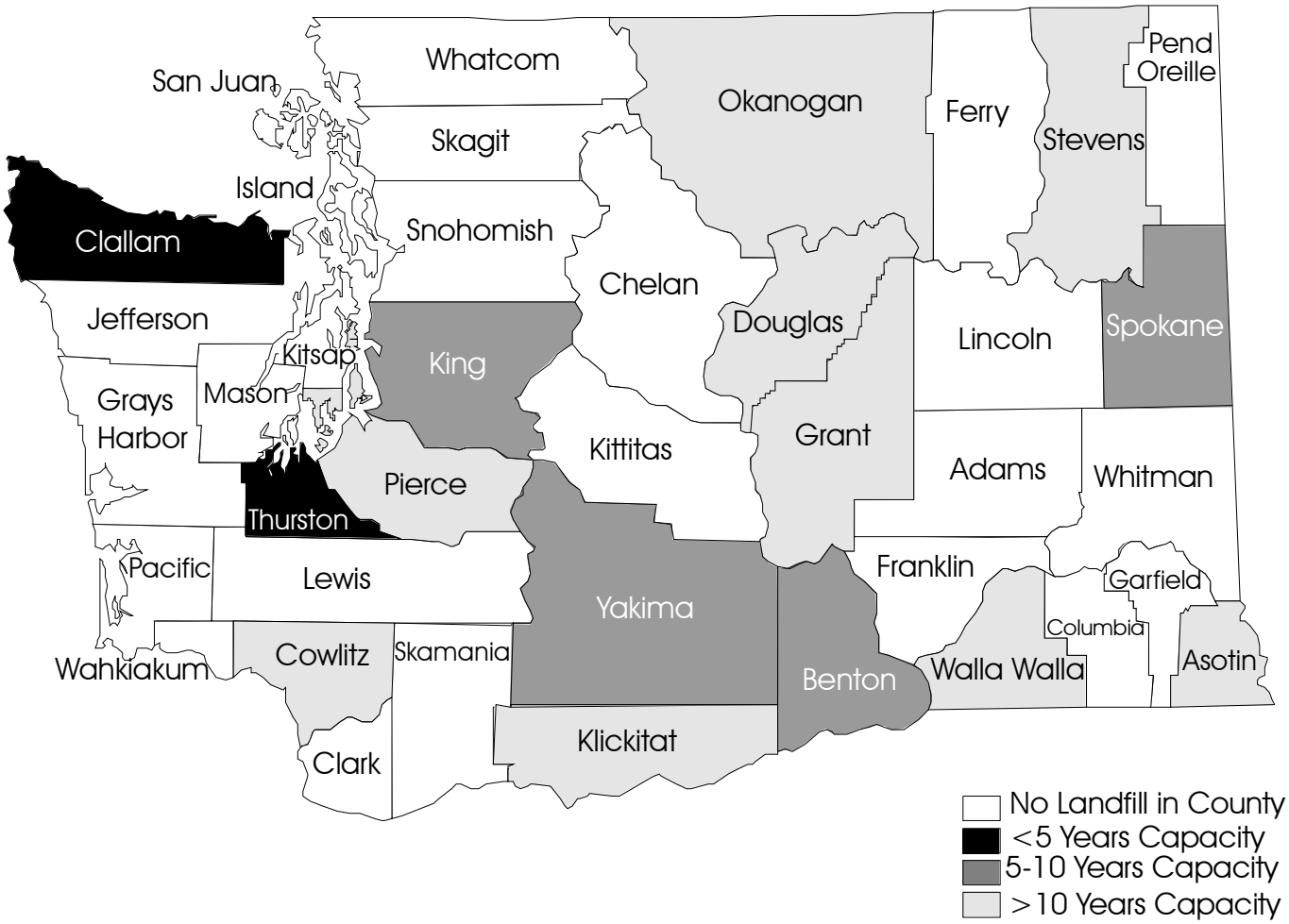
There are currently 18 municipal solid waste landfills operating as of September 2001. (See Map A for the location of operating MSW landfills and incinerators.) The amount of remaining capacity for the 18 MSW landfills was determined by asking the facilities to report remaining permitted capacity, as well as the expected closure date. In 2002, the facilities estimated about 179 million tons, or about 39 years, of capacity at the current disposal rate.[27] In 1994, facilities reported approximately 181 million tons of remaining capacity, about 49 years of remaining capacity statewide.[28] Changes in permit conditions, early landfill closures and projections of fewer expansions, and changing volumes affect remaining capacity, which has fluctuated the past several years. Of the 18 currently operating landfills, only 10 have greater than 10 years of remaining permitted capacity. (See Table 6.12 for an estimated number of facilities with specified remaining years of life.) Map D shows the counties and the remaining years of capacity of their MSW landfills.

Table 6.12
Estimated Years to Closure for MSW Landfills

YEARS TO CLOSURE	% OF TOTAL REMAINING CAPACITY	NUMBER OF FACILITIES	PUBLIC	PRIVATE
Less than 5 years	1%	3	2	1
5 to 10 years	10%	5	5	0
Greater than 10 years	89%	10	7	3
TOTALS	100%	18	14	4

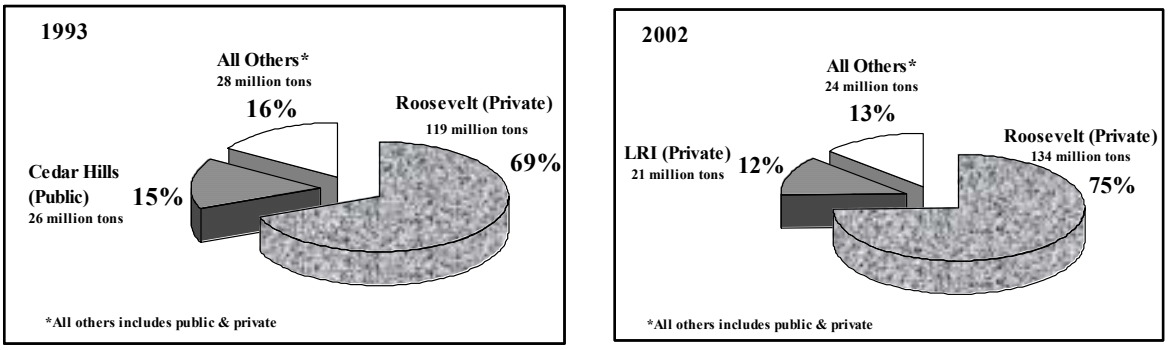
[27] This does not include a site in Adams County that has been permitted for 90,000,000 tons. Construction start of this facility is undecided at this time.
[28] *Solid Waste in Washington State - Third Annual Status Report*, Department of Ecology, Publication #94-194, December 1994.

Map D: Remaining Permitted MSW Landfill Capacity
(as of April 2002)



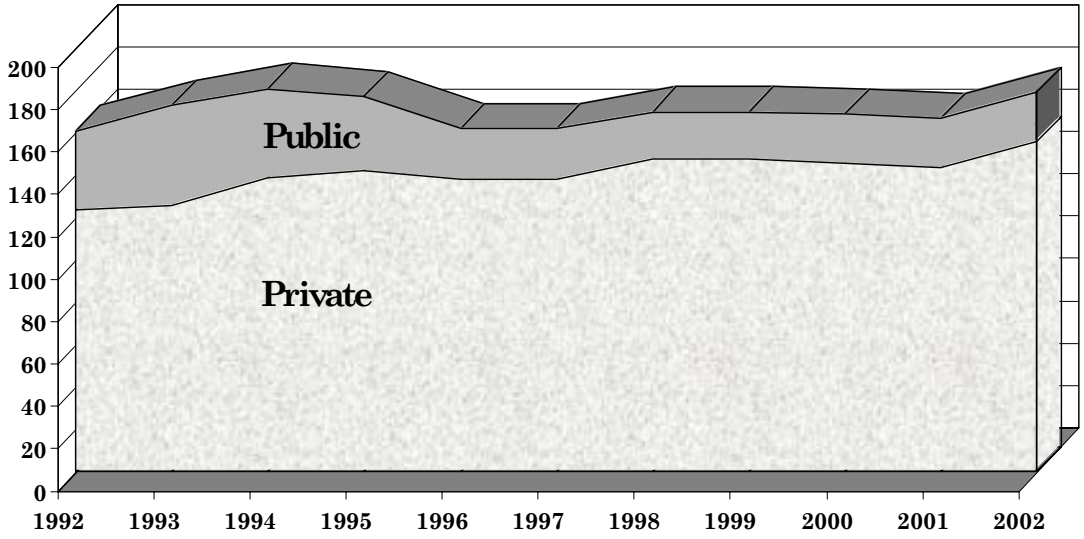
2002 capacity numbers indicated that 89% of the remaining capacity was at landfills with greater than 10 years to closure. Fourteen of the 18 operating MSW landfills are publicly owned with 13% of the remaining capacity (23.5 million tons). About 87% of the remaining permitted capacity (156 million tons) is at the four privately-owned facilities, compared to 73% in 1993. The majority of the capacity, about 75% of the total statewide capacity, is at the privately owned Roosevelt Regional Landfill in Klickitat County. Another 12% of the statewide total capacity is at newly constructed, privately owned landfill in Pierce County, 6% at the publicly owned Cedar Hills landfill in King County, with the remaining 7% of capacity spread among the remaining 15 landfills in the state (see Figure 6.7).

Figure 6.7
Comparison of Remaining Permitted Capacity
1993 and 2002



The remaining capacity at private landfills has exceeded that for public facilities since the amounts were tracked in 1992. (Figure 6.8).

Figure 6.8
Remaining Capacity MSW Landfills
(public/private in million tons)



Besides the amount of remaining capacity, the availability of that capacity needs to be considered. The Roosevelt Regional Landfill is operated to accept waste from a wide variety of locations (see Map B). In 2001, the facility received some type of solid waste from 32 counties in Washington, including the majority of the solid waste from thirteen counties. Waste was also received from Alaska, Oregon, and British Columbia. Other landfills in the state are operated to accept the majority of waste from the county in which they operate. In order to reserve the capacity for local citizen needs, some are also using the regional facility for some of their disposal needs.

The 39 year estimate of total remaining permitted capacity is based on the amount of waste disposed in MSW landfills in 2001. This amount will vary depending upon waste reduction and recycling activities, population growth or decline, as well as the impact of waste being imported into the state for disposal or additional waste which is currently disposed out-of-state, being disposed in-state. As discussed previously, there has been an increase in the types of waste, other than municipal waste, being disposed of in MSW landfills. Part of this is the liability concern (that is, it is better to pay a higher cost and transport further to dispose in a well designed landfill). As requirements change for other types of landfills in chapter 173-350 WAC, *Solid Waste Handling Standards*, some of those facilities may close and there will likely be an increase in the types and amounts of materials recycled, as well as a shift of the types of solid waste moving to the MSW landfills for disposal.

Chapter VII. Moderate Risk Waste Collection System

The term "Moderate Risk Waste" was created by revisions to chapter 70.105 RCW, *Hazardous Waste Management*. MRW is a combination of household hazardous waste (HHW) and conditionally exempt small quantity generator (CESQG) waste. HHW is considered waste that was generated in the home, while CESQG is small quantities of business or non-household waste. Both HHW and CESQG waste are exempt from hazardous waste regulations.

MRW FACTOIDS

- Total MRW collection in 2001 was over 28 million pounds.
- The average amount of HHW disposed by the 6% of all households that used a HHW collection event or fixed facility was 103 pounds.
- The counties that had the most SQG waste per capita were Yakima, Kittitas, Grays Harbor, and Asotin.
- The counties that collected the most used oil per Housing Unit were Adams, King, Stevens, Franklin, Cowlitz, and Mason.
- The counties that had the largest percentage of participation per housing unit at HHW events or facilities were Grays Harbor, Spokane, Benton, Jefferson, Island, Asotin, Walla Walla, and Thurston.
- The counties that properly disposed or recycled the most MRW per capita were Cowlitz, Kittitas, Mason,

MRW collections started in the early 1980s primarily as HHW-only events, also known as "round-ups." These events usually transpired once or twice a year. In the late 1980s permanent collection facilities, now known as fixed facilities, began to replace the collection events in order to fulfill the need for year-round collection. These efforts resulted in a larger number of customers served, decreased costs, and increased reuse and recycling of MRW. HHW has been the primary focus of MRW collection programs until recently. Efforts are beginning to produce an increase in the collection of CESQG waste at facilities. Currently there are twenty public MRW programs that collect CESQG waste.

Chapter 70.105D RCW, *Hazardous Waste Cleanup – Model Toxics Control Act* provides for a large part of the funding for public MRW programs. Funds are used to meet the planning and implementation requirements for local hazardous waste (MRW) programs in each local jurisdiction.

By 1991, all local governments had submitted MRW plans. Aspects included in every local MRW plan are CESQG Technical & Disposal Assistance, MRW Public Education, MRW Enforcement and HHW Collection.

Annual Reporting and Accuracy of Data Collection

Local programs are required to submit MRW report forms annually. For the past few years, the Solid Waste & Financial Assistance Program (SW&FAP) has requested annual reports be received by March for previous calendar year collections. The information received from local programs through the MRW annual reports provides data on MRW infrastructure, collection trends, costs, waste types received by collection events and fixed facilities, and the final disposition of MRW. This data contained here is specifically designed to be useful to those who operate or work MRW programs within Washington State.

Although SW&FAP has created and does circulate a standard reporting form to all MRW programs, the reported data can vary depending on a program's collection process, how the data is reported, and how the reported data is interpreted.

For the 2001 reporting year a few programs failed to submit the required annual reports. In addition, not every program reported all the required information. Data not received for 2001 was replaced with a flat line data entry from the year 2000 data to maintain county, regional, and state estimates. This report will note key areas where there is unusual data or anomalies.

Year 2001 Data

This year's report focuses on year 2001 data with some comparisons to the data published in last year's report. In an attempt to provide useful information for individual programs, it was determined that data would be presented in categories by county size. Figure 7.1 and Table 7.1 indicates a distinction between counties with a population of less than 50 thousand, 50 thousand to 100 thousand, and populations greater than 100 thousand.

Figure 7.1
Percent of State Population by County Size

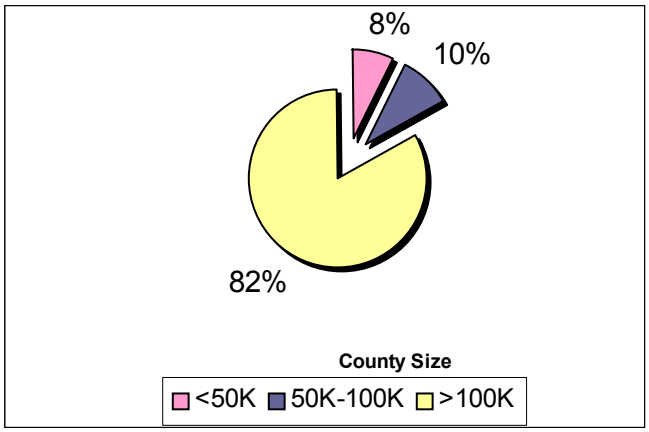


Table 7.1
Individual County Population by Size

<50K		50K-100K		>100K	
Adams	16,600	Chelan	67,100	Benton	144,800
Asotin*	23,100	Clallam	64,454	Clark	352,600
Douglas	32,800	Cowlitz*	97,700	King*	1,190,200
Ferry	7,300	Grant	75,900	Kitsap	233,400
Franklin	50,400	Grays H	68,500	Pierce	713,400
Jefferson	26,446	Island	72,400	Skagit	104,100
Kittitas	34,000	Lewis	69,500	Snohomish	618,600
Klickitat	19,300	Walla Walla*	59,300	Spokane	422,400
Lincoln	10,200	50K-100K total	575,854	Thurston	210,200
Mason	49,600			Whatcom	170,600
Okanogan	39,700			Yakima	224,500
Pacific	21,000			Seattle SWU	568,100
Pend Oreille	11,800			>100K total	4,950,729
San Juan	14,400				
Skamania	9,900				
Stevens	40,300				
Whitman	40,300				
<50K total	443,664				

- **Populations were combined: Garfield w/ Asotin; Wahkiakum w/ Cowlitz; Columbia w/ Walla Walla**
- **King excludes Seattle**
- **Seattle SWU is Seattle only**

In Washington there are 42 programs that manage MRW. All programs are required to provide individual MRW reports. These programs include all 39 counties. King County generates four reports: King County Waste Mobile and Used Oil Collection System, Seattle Solid Waste Utility (HHW), Port of Seattle (HHW) and Seattle City Light (CESQG). King County data is segregated from Seattle data in the form of Seattle Solid Waste Utility, Port of

Seattle, and Seattle City Light, and these programs report as three separate programs. Some counties combine reports. Columbia County data is included with Walla Walla County data and Garfield County data is included with Asotin County data. Wahkiakum County data is included with Cowlitz County data except for one used oil site report for Wahkiakum County.

Many HHW collection systems are approaching stability. There are no remaining large counties without a permanent HHW collection facility (or fixed facility). Some programs continue to explore or are expanding. It is unclear to what extent local programs will be accepting increasing quantities of CESQG, electronics, and other types of MRW wastes not typically accepted in the past. CESQG waste is being accepted by more local programs each year.

MRW Collected

As shown in Table 7.2, Washington collected over 15.6 million pounds of HHW, almost 11.3 million pounds of used oil (UO) from collection sites, and about 1.0 million pounds of CESQG waste, for a total of over 27.9 million pounds of MRW collected in 2001.

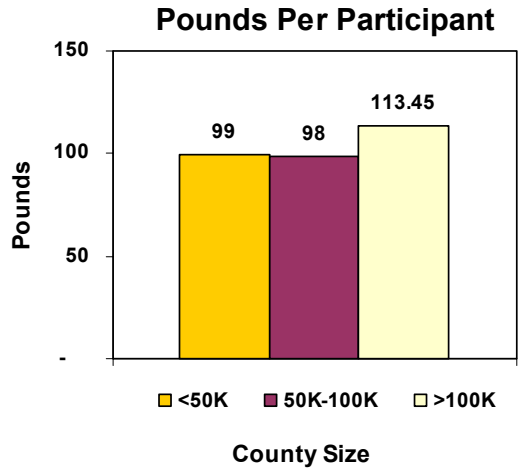
Table 7.2
Year 2001 Total Pounds Collected Per Waste Category

HHW lbs. (no UO Sites)	Used Oil lbs. (Collection Sites)	HHW lbs. (including UO Sites)	CESQG lbs.	Total MRW lbs.
15,638,009	11,280,112	26,918,121	978,732	27,896,853

HHW (no UO sites) Pounds Per Participant by County Size

Figure 7.2 shows the total pounds of HHW (no UO sites) collected per participant by county size in 2001. The average pounds collected statewide per participant for HHW collections was 103.

Figure 7.2
Pounds Per Participant



The totals in Table 7.2 reflect a significant increase from an estimated 19.8 million pounds of MRW collected in 2000. This increase as shown in Table 7.3 is because of increased collection of HHW, principally used oil, paints and lead acid batteries.

Table 7.3
Total Pounds per Waste Category for Years 1998, 1999, 2000, 2001

Collection Year	HHW lbs. (no UO Sites)	Used Oil lbs. (Collection Sites)	CESQG lbs.	Total MRW lbs.
1998	~9.6M	~9.2	~500K	~19.3M
1999	~9.9M	~9.3M	~637K	~20.4M
2000	~10.5M	~8.3M	~1.1M	~19.8M
2001	15.6M	11.3M	1.0M	27.9M

Household Hazardous Waste

As shown in Table 7.4, the dominant types of HHW collected in 2001 were Lead Acid Batteries, latex and oil-based paint, non-contaminated used oil, and flammable liquids. These specific waste types accounted for 90% of the estimated 15.8 million pounds of HHW collected in 2001. These are the same top five HHW types as in 1998, 1999 and 2000.

Table 7.4
HHW Dominant Waste Types Collected in 2001

Waste Type	Total Lbs.
Lead Acid Batteries	5,467,759
Latex Paint	2,936,810
Oil Based Paint	2,521,531
Oil Non-contaminated	1,662,269
Flammable Liquids	1,591,521
Total	14,179,890

Table 7.5 shows the top five counties with the highest collections of HHW in pounds per capita (not participant) for 1999, 2000, 2001.

Table 7.5
High Collections of HHW (no Used Oil Sites)
Pounds Per Capita by County in 1999-2001

HHW 1999			HHW 2000			HHW 2001		
County	Size	Lbs./Capita	County	Size	Lbs./Capita	County	Size	Lbs./Capita
Skamania	<50K	4.14	Klickitat	<50K	5.96	Cowlitz	50K-100K	9.46
Yakima	<100K	4.00	Pend Oreille	>50K	4.78	Pend Oreille	<50K	7.16
Kittitas	<50K	3.97	Benton	<100K	3.97	Mason	<50K	6.26
Lewis	50K-100K	3.62	Yakima	>100K	3.82	King	>100K	4.65
Klickitat	>50K	3.02	Kittitas	<50K	3.61	Whatcom	>100K	4.62

Conditionally Exempt Small Quantity Generator Waste
There are twenty local MRW programs that collect CESQG waste from the public. Counties that sponsor CESQG waste collections are Asotin, Benton, Clallam, Clark, Cowlitz, Douglas, Grant, Grays Harbor, Island, Jefferson, Kitsap, Kittitas, San Juan, Skagit, Snohomish, Thurston, Whatcom, and Yakima. Also Included in CESQG waste totals for year 2001 are data from Philip Services. Philip Services primarily serves CESQG's in three counties: King, Pierce and Clark.

As shown in Table 7.6 the dominant 20 types of CESQG waste collected in 2001 were non-contaminated oil, oil based paint and flammable liquids. These 3 specific waste types accounted for 65% of the 1.2 million pounds of CESQG waste collected in 2001.

Table 7.6
CESQG by Waste Type Collected in 2001(top 20 types)

Waste Type	Total lbs. CESQG
Oil Non-Contaminated	291,022
Oil Based Paint	140,807
Flammable Liquids	210,847
Latex Paint	54,460
Antifreeze	82,336
Lead Acid Batteries	70,863
Oil Filters, crushed	24,575
Bases	19,815
Oil, contaminated	6,457
Acids	16,625
Flammable Liquids	12,552
Other Dangerous Waste	11,205
Pesticide/Poison Liq	7,911
Oil, PCB	6,781
Flam. Liq. aerosols	5,728
Dry Cell Batteries	5,920
Oxidizers	2,813
Chlorinated Solvents	1,491
Pesticide/Poison Sol	1,651
N/NIMH/LITH Batteries	2,070
All other types	3,803
TOTALS	**978,732**

Used Oil Sites

In 2001, reported used oil collection sites yielded 11,280,112 pounds of used oil. Used oil collection by county size showed variability in pounds per capita. For example, Stevens County with a population of 40,300 collected 160,543 pounds of used oil from 12 sites (about 4.0 lbs/capita), while Clark County with a population of 352,600 collected 535,619 pounds of used oil from 11 sites (or about 1.5 lbs/capita). See Table 7.7 for the six highest collections in pounds per capita by county size for 1999, 2000 and 2001.

Table 7.7
High Collection Counties, Used-Oil Sites Pounds Per Capita by County Size

Used Oil Sites - 1999			Used Oil Sites - 2000			Used Oil Sites - 2001		
County	Size	Lbs./Capita	County	Size	Lbs./Capita	County	Size	Lbs./Capita
San Juan	<50K	6.1	Stevens	<50K	3.9	Mason	<50K	4.0
Asotin	<50K	4.2	Cowlitz	50K-100K	3.7	Stevens	<50K	4.0
Stevens	<50K	4.0	Pacific	<50K	3.6	King	>100K	3.9
Klickitat	<50K	3.7	Douglas	<50K	2.9	Cowlitz	50K-100K	3.5
Cowlitz	50K-100K	3.1	Lewis	50K-100K	2.8	Skamania	<50K	3.2
Jefferson	<50K	3.0	Franklin	<50K	2.7	San Juan	<50K	3.0

Statewide Level of Service

The US Census Bureau reports that as of 2001 there were an estimated 2,511,054 Housing Units[29] in Washington State. MRW Annual Reports revealed there were 150,795 participants in HHW collection in 2001 excluding numbers for Adams, Klickitat, Pend Oreille and Skagit counties because this information was not provided. The actual number of households served is much larger due to the fact that most used oil sites do not record or report numbers of participants (Spokane is the exception). Because some participants that are counted at events or by facilities bring HHW from multiple households, the number of households served can be estimated by adding ten percent to the participant values for an estimated 165,875 households served in 2001. This number represents 6.6% of all households in Washington State. This is a decrease from 2000 when an estimated 7.8% of Washington households were served.

[29] This information was downloaded from Website http://quickfacts.census.gov/hunits/states/53cty.html.

Table 7.8 shows participant levels and amounts of HHW and total MRW collected by county.

Table 7.8
Various Data by County

COUNTY	HHW lbs. w/o (no UO sites)	UO lbs.[1]	CESQG lbs.	MRW lbs.	County H.U.[2]	MRW lbs./H.U.	HHW Participants	%Partic.	HHW Cost/ Participant
Adams	-	82,162	-	82,162	5842	14.06	N.R.	N.R[3].	N.A.[4]
Asotin	72,991	-	5,439	78,430	10476	7.49	860	0.08	61.45
Benton	297,138	63,470	17,043	377,651	56971	6.63	6116	0.11	29.84
Chelan	50,078	52,910	5,303	108,291	30683	3.53	735	0.02	85.5
Clallam	71,276	153,321	6,520	231,117	30927	7.47	799	0.03	70.55
Clark	1,131,087	535,619	-	1,666,706	137161	12.15	3498	0.03	84.67
Cowlitz	924,363	342,687	14,506	1,281,556	40999	31.26	1669	0.04	89.25
Douglas	38,071	45,510	1,159	84,740	13077	6.48	540	0.04	55.54
Ferry	1,347	3,700	-	5,047	3832	1.32	26	0.01	72.92
Franklin	8,892	134,438	-	143,330	16457	8.71	150	0.01	132.50
Grant	83,802	9,220	1,007	94,029	29545	3.18	534	0.02	86.16
Grays H	90,820	-	19,998	110,818	32623	3.40	10776	0.33	12.63
Island	248,777	145,499	9,465	403,741	32959	12.25	3304	0.10	49.14
Jefferson	32,870	54,434	5,923	93,227	14424	6.46	1495	0.10	56.08
Seattle	1,062,104	222,817	-	1,284,921	273342	4.70	13242	0.05	45.37
King	5,530,471	4,723,954	192,733	10,447,158	480251	21.75	21012	0.04	89.87
Kitsap	404,899	371,310	40,030	816,239	93731	8.71	4320	0.05	185.09
Kittitas	86,265	-	103,055	189,320	16728	11.32	204	0.01	54.65
Klickitat	70,605	51,378	-	121,983	8757	13.93	N.R.	N.R.	N.A.
Lewis	133,245	174,344	-	307,589	30041	10.24	1062	0.04	71.52
Lincoln	-	-	-	-	5325	-	150	0.03	73.33
Mason	310,474	199,127	-	509,601	25875	19.69	746	0.03	78.37
Okanogan	65,585	31,265	-	96,850	19274	5.02	175	0.01	130.47
Pacific	50,088	-	11,911	61,999	14106	4.40	296	0.02	136.76
Pend Oreille	84,502	15,614	-	100,116	8729	11.47	N.R.	N.R.	N.A.
Pierce	379,988	353,054	-	733,042	282156	2.60	9294	0.03	35.00
San Juan	19,338	43,364	4,844	67,546	10099	6.69	150	0.01	135.75
Skagit	246,631	169,090	15,174	430,895	43346	9.94	N.R.	N.R,	N.A.
Skamania	22,265	31,968	-	54,233	5254	10.32	128	0.02	N.A.
Snohomish	1,564,211	1,366,025	79,545	3,009,781	241463	12.46	11657	0.05	44.87
Spokane*	443,600	682,280	-	1,125,880	176853	6.37	37251	0.21	17.29
Stevens	58,751	160,543	-	219,294	17829	12.30	520	0.03	58.42
Thurston	348,345	390,587	11,669	750,601	87821	8.55	6673	0.08	39.11
Walla Walla	82,485	72,268	-	154,753	23236	6.66	1796	0.08	73.61
Whatcom	788,001	74,622	55,127	917,750	75603	12.14	4481	0.06	44.63
Whitman	48,084	18,108	-	66,192	16740	3.95	520	0.03	84.91
Yakima	895,489	532,482	436,465	1,864,436	80028	23.30	4518	0.06	57.61
Statewide	15,638,009	11,280,112	978,732	27,896,853	2,492,563		148,697		

Footnotes:
1 US lbs - used oil collected at specific used oil sits
2 H.U. Housing Units equals number of households taken from Office of Financial Management, 2001 Data Book
3 NR - Not Reported
4 NA - Not applicable because data not reported

Collection by Waste Category and Type

Table 7.9 provides summary information on total pounds collected in all three categories of MRW by waste types.

Table 7.9
Total Pounds of MRW Collected by Waste Category

Waste Type	HHW	CESQG	UO Sites
Acids	73,856	16,625	
Acids, aerosols	642	368	
Antifreeze	358,777	82,336	
Bases	77,605	19,815	
Bases, aerosols	1,696	-	
CFC/ Freon	40		
CFC/ Freon filters	550		
Chlorinated Solvents	5,872	1,491	
N/NIMH.Lith	19,989	2,070	
Dry Cell Batteries	103,699	5,920	
Flammable Solids	18,866	880	
Flammable Liquids	1,591,521	210,847	
Flammable Liquids, aerosols	98,331	5,728	
Flammable Liquids Poison	58,236	12,552	
Flammable Liq. Pois., aerosols	18,905	59	
Flammable Gas	67,017	697	
Flammable Gas Poison	7,806	99	
Flammable Gas Pois., aerosols	8,153	139	

Waste Type	HHW	CESQG	UO Sites
Latex Paint	2,936,810	53,460	
Lead Acid Batteries	5,467,759	70,863	
Oil-Based Paint	2,521,531	140,807	
Oil Contaminated	138,394	6,457	
Oil Filters	23,003	1,297	
Oil Filters Crushed	10,308	24,575	
Oil Non-Contaminated	1,662,269	291,022	11,280,112
Oil with Chlorides	400		
Oil with PCBs	3,094	6,781	
Other Dangerous Waste	3,387	11,205	
Organic Peroxides	1,553	30	
Oxidizers	20,620	2,813	
Personal Protect. Equip.			
Pesticide/Poison Liq	253,268	7,911	
Pesticide/Poison Sol	81,441	1,651	
Reactives	2,192	14	
Mercury	419	220	
Totals	15,638,009	978,732	11,280,112
MRW TOTAL			27,896,853

Trends in Collection

As fixed facilities continue to gain popularity, the numbers of collection events are decreasing. Some programs are eliminating collection events altogether or using hybrid mobile collection systems. Reasons for this shift include: increased cost of collection events per amount of waste collected, fixed facilities providing a sense of permanence and normality to the collection of MRW, and increased operation efficiencies with fixed facilities including the option of having an efficient location to conduct a collection service for CESQG's.

Mercury Waste Streams and Other Waste Streams

MRW collection programs are well established statewide. Many of these programs are exploring management of various other components of municipal solid waste. Mercury-containing lamps and electronic wastes are two of these emerging waste types.
There is a need to pay attention to the collection of mercury waste streams. Fluorescent and high intensity lamps contain small amounts of mercury. There will be an estimated 35 tons of mercury discharged into the atmosphere from the 550 million lamps currently in use by Americans (Greskovich 1997).

Used electronics are also of concern. Components in a number of electrical and electronic products are known to contain one or more of the following substances: mercury, lead; cadmium; embedded batteries; and polychlorinated biphenyls (PCBs).

As technology continues to lead to better electronic products, and as more people become financially able to obtain these popular commodities, disposal of the leftovers as well as their components becomes a concern for Ecology and local solid waste managers. For example, in the European Union an estimated four percent of their municipal solid waste stream is electronics, other electrical devices and appliances as of 1999. By the year 2010, predictions for this waste sub-stream will double (Ecology 1999).

References - Chapter 7

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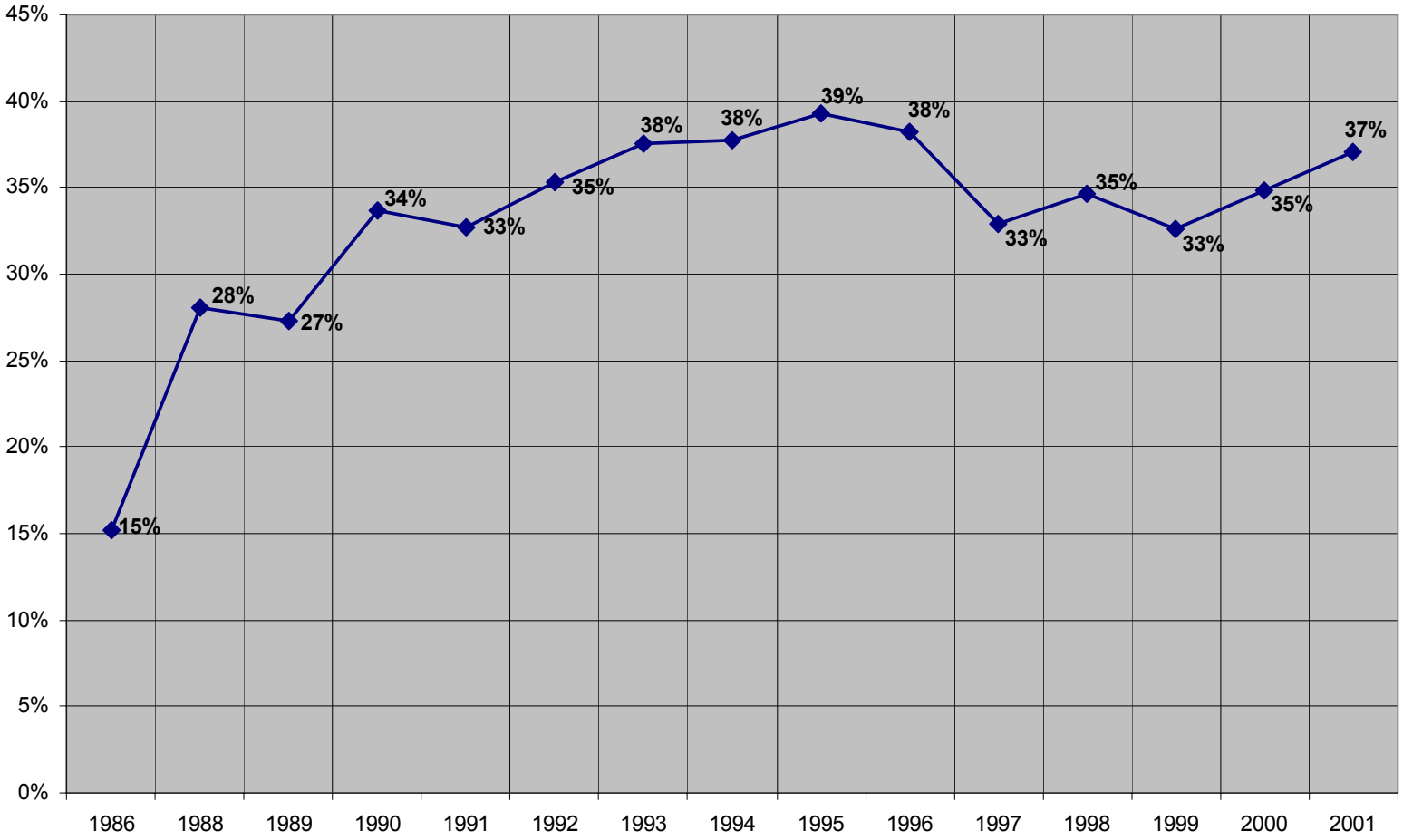
APPENDIX A
STATE MAP WITH COUNTY NAMES

State Map with County Names

APPENDIX B
WASHINGTON STATE RECYCLING RATE
1986 - 2001

Table B.1
Washington State Recycling Rate 1986 to 2002



APPENDIX C
FACILITY SPECIFIC DISPOSAL DATA FOR 2001

Table C.1
2001 Total Waste Disposed in Municipal Solid Waste Landfills

Facility	County	MSW	Demo	IND	INERT	Comm	WOOD	Sludge	ASB	PCS	TIRE	Med	OTHER	TOTAL
Asotin County	Asotin	38,400	0	0	0	0	0	0	0	0	0	0	0	**38,400**
Cedar Hills Landfill	King	938,172	897	0	0	0	0	0	87	35	0	0	315	**939,506**
Cheyne Road	Yakima	60,747	0	0	0	0	0	0	0	0	0	0	0	**60,747**
Cowlitz County - B	Cowlitz	45,475	3,882	4,704	0	24,305	0	0	16	0	24	0	0	**78,406**
Delano Landfill	Grant	4,269	360	0	625	525	0	0	0	0	0	0	0	**5,779**
Ephrata Landfill	Grant	80,948	0	0	0	0	0	0	0	0	135	0	175	**81,258**
Fort Lewis Landfill #5	Pierce	48,629	0	0	311	2,659	383	2	2	0	0	0	0	**51,986**
Greater Wenatchee	Douglas	106,443	0	0	0	0	0	613	21	7,635	481	0	602	**115,795**
Horn Rapids	Benton	26,644	5,383	1,121	3,535	19,786	77	858	0	28	0	0	182	**57,614**
LRI Landfill	Pierce	372,622	4,573	14,881	0	801	0	0	21	2,688	0	334	108,101	**504,021**
New Waste (closed 02)	Franklin	1,140	521	0	660	5,435	48	0	297	1,228	1	0	736	**10,066**
Northside Landfill	Spokane	2,840	8,546	0	0	0	0	0	0	0	0	0	0	**11,386**
Okanogan Central	Okanogan	23,075	6	0	0	0	10	0	5	0	8	0	86	**23,190**
Olympic View (closed 02)	Kitsap	165,315	57,302	0	21,245	0	0	0	933	78,286	20	0	46,733	**369,834**
Port Angeles	Clallam	33,295	6,789	0	0	11,612	0	0	13	213	0	0	0	**51,922**
Roosevelt Regional	Klickitat	1,202,779	284,995	174,925	0	0	33,736	0	4,471	127,608	7,482	0	118	**1,836,114**
Stevens County	Stevens	23,653	0	5,567	0	1,268	0	0	0	0	356	0	0	**30,844**
Sudbury Road	Walla Walla	56,506	0	0	0	0	0	0	125	0	60	53	0	**56,744**
Tacoma, City of	Pierce	49,121	0	0	0	0	0	0	0	0	0	0	0	**49,121**
Terrace Heights	Yakima	152,286	0	0	0	0	0	0	0	0	0	0	0	**152,286**
21		**3,432,359**	**373,254**	**201,198**	**26,376**	**66,391**	**34,254**	**1,473**	**5,991**	**217,721**	**8,567**	**387**	**157,048**	**4,525,019**

Table C.2
2001 Total Waste Disposed Energy Recovery/Incinerators

Facility Name	MSW	DEMO	IND	INERT	COMM	WOOD	SLUDGE	MED	TIRES	OTHER	TOTAL
City of Tacoma Steam Plant (inactive 02)	39,554	13,745	0	0	0	170,747	0	0	0	1,043	225,089
Inland Empire Paper	0	0	0	0	0	9,072	0	0	0	0	9,072
Ponderay Newsprint Co.	0	0	0	0	0	3,938	0	0	0	0	3,938
Spokane Regional Waste to Energy Facility	258,053	0	0	0	0	0	0	0	0	0	258,053
4	**297,607**	**13,745**	**0**	**0**	**0**	**183,757**	**0**	**0**	**0**	**1,043**	**496,152**

Table C.3
2001 Total Waste Disposed Inert-Demolition Waste Landfills

Facility Name	DEMO	IND	INERT	COMM	WOOD	SLUDGE	ASB	PCS	TIRES	OTHER	TOTAL
Adams Street Inert Waste Disposal Site	0	0	1,461	0	0	0	0	0	0	0	1,461
ALCOA Inert Waste/Demolition Landfill	0	0	2,093	0	0	0	3	0	0	0	2,096
Anderson Demolition Site	29,139	0	0	0	0	0	0	1,037	0	2,646	32,822
Asotin County I & D Landfill	2,394	0	0	0	0	0	0	0	0	0	2,394
Asphalt & Gravel Products, Inc. Demo Landfill	17,299	0	376	0	0	0	0	0	0	0	17,675
Box Canyon Site	0	0	12,225	0	0	0	0	0	0	0	12,225
Busy Bee Landfill	6,858	0	5,891	0	0	0	0	0	0	0	12,749
Caton Inert & Demo Landfill	8,995	0	533	0	167	0	0	0	0	0	9,695
Central Pre-Mix Site (Fort Wright)	0	0	10,000	0	0	0	0	0	0	0	10,000
Centralia Mining CDL	0	0	400	0	0	0	0	0	765	0	1,165
Chester Landfill	34,051	0	4,468	0	0	0	0	0	0	0	38,519
City of Kennewick Inert/Demo Landfill	2,348	0	1,695	0	0	0	0	0	0	0	4,043
County Construction Recyclers, Inc.	28,936	0	1,725	0	0	0	0	0	0	0	30,661
Coupeville Demolition LF	478	0	204	0	0	0	0	0	0	0	682
Douglas County Lux Pit (Nile-99.1)	320	0	850	0	0	0	0	0	0	0	1,170
Fillion Inert/Demo Site	2,300	0	0	0	0	0	0	0	0	0	2,300
Humbert Demolition Landfill	0	0	4,032	0	0	0	0	0	0	0	4,032
Indian Island CDL Landfill	36	0	0	0	0	0	0	0	0	0	36
Inland Asphalt Landfill	0	0	50,000	0	0	0	0	0	0	0	50,000
Inland Crestline Recycling	0	0	51,250	0	0	0	0	0	0	0	51,250
Kaiser-Mead Inert & Demolition Site	100	0	806	0	0	0	0	0	0	0	906
Kittitas County Inert & Demo Landfill	7,766	0	0	0	0	0	0	0	0	0	7,766
Marine View North, LLC	0	0	34,295	0	0	0	0	0	0	0	34,295
McChord Inert Waste Landfill	0	0	1,363	0	0	0	0	0	0	0	1,363
Pipkin/Handley Landfill	0	0	7,889	0	0	0	0	0	0	0	7,889
Prosser Inert/Demo Landfill	0	0	325	0	0	0	0	0	0	0	325
Rinker Materials	41,289	0	0	0	0	0	0	318,068	0	0	359,357
Steve Clark Demolition Waste Landfill	45	0	0	0	0	0	0	0	0	0	45
Whitman College Site	28,277	0	0	0	0	0	0	0	0	0	28,277
Yakima Training Center Inert/Demo Landfill	0	0	2,875	0	0	0	0	0	0	0	2,875
	210,631	**0**	**194,756**	**0**	**167**	**0**	**3**	**319,105**	**765**	**2,646**	728,073

Table C.4
2001 Total Waste Disposed Limited Purpose/Special Use Facilities

Facility Name	DEMO	IND	INERT	COMM	WOOD	SLUDGE	ASB	PCS	TIRES	OTHER	TOTAL
BP Cherry Point Refinery	0	2,873	0	0	0	0	0	535	0	0	**3,408**
Dickson - CDL - So 50th & Tyler St	0	0	18,788	0	0	0	0	0	0	0	**18,788**
Dickson -East 48th & Waller Road Fill Site	0	0	150,118	0	0	0	0	0	0	0	**150,118**
Graham Road Recycling & Disp	46,228	2,853	19,173	0	1,429	0	1,242	11,996	41	20,800	**103,762**
Intalco Aluminum Corp	182	4,016	1,526	0	0	0	0	600	0	0	**6,324**
Kettle Falls Generating Station Wood Ash Landfill	0	26,959	0	0	0	0	0	0	0	0	**26,959**
Lady Island Limited Purpose Landfill	0	0	8,217	0	2,524	0	0	0	0	0	**10,741**
Lawson Limited Purpose Site	0	22,824	0	0	0	0	0	0	0	0	**22,824**
Port Townsend Paper	0	13,100	0	0	0	0	0	0	0	0	**13,100**
Rayonier Inc. (Mt. Pleasant) (closed 01)	0	979	4,755	0	2,845	0	0	0	0	1,398	**9,977**
Simpson Dayton Landfill	0	18,117	0	0	0	0	0	0	0	2,500	**20,617**
Weyerhaeuser Regional Landfill	23,004	233,393	0	0	43	0	0	91	0	0	**256,531**
Whitman Co. Limited Purpose Landfill & Transfer St	2,403	0	0	0	0	0	40	0	0	0	**2,443**
	71,817	**325,114**	**202,577**	**0**	**6,841**	**0**	**1,282**	**13,222**	**41**	**24,698**	**645,592**

Table C.5
2001 Total Waste Disposed for Woodwaste Landfills

Facility Name	DEMO	IND	INERT	COMM	WOOD	SLUDGE	ASB	PCS	TIRES	OTHER	TOTAL
Stafford Creek Woodwaste Landfill	31,559	0	0	0	21,739	0	0	0	0	0	**53,298**
	31,559	**0**	**0**	**0**	**21,739**	**0**	**0**	**0**	**0**	**0**	**53,298**

Table C.6
2001 Total Waste Composted

Company	County	Yard waste	Other wood waste	Sawdust	Biosolids	Vegetative food waste	Manure	Post consumer food waste	Other	TOTAL
Bailand Farms YW Composting	Snohomish	17,000	0	0	0	0	8,000	0	0	***25,000***
Cedar Grove Composting, Inc.	King	133,954	2,468	0	0	15,323	0	44	19,852	***171,641***
City of Cheney - Wastewater Division	Spokane	2,200	1,200	0	240	0	0	0	0	***3,640***
City of Port Townsend	Jefferson	3,741	0	0	254	0	0	0	0	***3,995***
Columbia Compost	Columbia	149	0	0	0	0	0	0	1	***150***
Cowlitz County Public Works	Cowlitz	1,200	3,175	0	5,680	0	0	0	0	***10,055***
Dykstra Composting Facility	Skagit	0	0	0	0	0	0	0	758	***758***
GROCO	King	0	0	7,000	6,000	0	0	0	0	***13,000***
H&H Wood Recyclers	Clark	1,250	0	0	0	0	0	0	0	***1,250***
Hi Q Compost Facility	Skagit	0	0	0	0	0	120	0	0	***120***
Hilltop Emu Ranch	Kitsap	2	0	0	0	0	245	0	3,007	***3,254***
Johnson Agriprises	Adams	0	0	0	0	0	990	0	950	***1,940***
LaConner, Town of WWTP	Skagit	31	0	2,310	166	0	0	0	0	***2,507***
Lamb-Weston, Inc.	Franklin	0	0	0	0	0	0	0	1,302	***1,302***
Langley City Water & Wastewater Services	Island	250	0	90	21	0	0	0	0	***361***
Little Hanaford Farms	Lewis	225	253	6,160	0	0	0	0	354	***6,992***
LRI	Pierce	11,094	241	0	0	0	0	0	0	***11,334***
Lynden, City of WWTP	Whatcom	75	2,520	4,032	507	0	0	0	0	***7,134***
Miller Creek Compost Facility	King	0	0	0	480	0	0	0	230	***710***
Monroe, City of WWTP	Snohomish	0	0	2,200	3,000	0	0	0	0	***5,200***
Natural Selection Farms, Inc.	Yakima	1,300	600	0	3,000	0	1,600	0	5,552	***12,052***
Norcal Waste Systems of Spokane, Inc.	Spokane	37,867	0	5,004	0	0	0	0	0	***42,871***
Pacific Topsoils	Snohomish	46,107	0	0	0	0	8,336	0	21,141	***75,584***
Pierce County Recycling Composting & Disposal, LLC dba LRI	Pierce	55,312	1,991	0	0	0	0	0	2,438	***59,741***
Quincy Compost	Grant	1,350	45	0	0	0	0	0	0	***1,395***
Skagit Soils	Skagit	8,975	0	0	0	0	0	0	0	***8,975***
Soil Life Systems, Inc	Walla Walla	0	0	0	0	0	5,680	0	21,012	***26,692***
Soos Creek Organics, Inc.	King	30,053	3,521	528	0	2,754	2,297	0	781	***39,934***
South Sound Soils, LLC	Thurston	600	13,200	0	10,598	0	0	0	0	***24,398***
Thurston County Water & Waste Management	Thurston	5,262	5,262	0	0	0	0	0	0	***10,524***
WADOC	Jefferson	1	170	1	316	0	0	0	14	***502***
Walla Walla Compost	Walla Walla	1,895	0	0	0	0	0	0	0	***1,895***
Washington State University	Whitman	0	0	0	0	32	9,553	128	3,942	***13,655***
West Van Materials Recovery Facility	Clark	3,071	0	0	0	0	0	0	0	***3,071***
Wilcox Farms, Inc.	Pierce	0	12,000	0	0	0	5,086	0	0	***17,086***
35		***362,963***	***46,646***	***27,325***	***30,263***	***18,109***	***41,906***	***172***	***81,334***	**608,719**

APPENDIX D
DISPOSAL DATA SUMMARIES
1992 - 2001

Table D.1
Waste Types Reported Disposed in MSW Landfills 1992-2001

WASTE TYPES	1992 (Tons)	1993 (Tons)	1994 (Tons)	1995 (Tons)	1996 (Tons)	1997 (Tons)	1998 (Tons)	1999 (Tons)	2000 (Tons)	2001 (Tons)
Municipal Solid Waste*	2,694,800	2,641,551	2,725,084	2,777,030	2,807,998	3,083,286	3,222,639	3,421,415	3,336,745	3,432,359
Demolition Waste	250,144	331,231	459,979	382,513	375,412	385,412	446,172	437,005	569,239	373,254
Industrial Waste	101,607	44,471	150,218	161,779	145,617	163,431	159,781	232,905	88,841	201,198
Inert Waste	1,027	0	31,248	5,154	30,061	117,512	107,452	23,875	19,349	26,376
Commercial Waste	143,466	180,691	92,498	142,258	109,093	173,863	158,256	129,070	93,752	66,391
Woodwaste	60,523	98,595	22,668	37,850	57,667	57,128	60,383	68,889	47,087	34,254
Sewage Sludge	64,311	33,854	64,364	66,728	49,205	72,741	67,419	62,920	47,783	1,473
Asbestos	8,247	7,076	11,819	7,859	7,965	9,558	10,684	9,666	7,922	5,991
Petroleum Contaminated Soils	224,560	273,429	249,552	255,288	254,414	444,260	288,407	312,247	231,290	217,721
Tires	na	1,288	1,815	28,712	12,787	14,912	19,130	12,581	43,188	8,567
Special	na	na	Na	na	10	6	904	0	437	917
	na	na	na	na	na	na	na	na	239	387
Other**	12,053	113,869	69,371	136,644	233,526	10,809	40,880	28,235	173,711	156,131
TOTAL	3,560,738	3,726,055	3,878,615	4,001,815	4,083,755	4,532,918	4,582,107	4,738,808	4,659,582	4,525,019

* Some facilities include demolition, industrial, inert, commercial and other small amounts of waste types in the MSW total.

** Some of the "other" types of waste reported include non-municipal ash, auto fluff and white goods.

Table D.2
Waste Types and Amount Disposed at Inert/Demolition Landfills 1992-2001

WASTE TYPES	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Municipal	0	0	0	0	0	0	0	0	0	0
Demolition	750,627	168,066	157,758	103,903	133,469	262,793	180,268	173,088	259,255	211,901
Industrial	0	0	0	0	0	121	0	0	0	0
Inert	139,366	272,047	200,172	121,943	226,362	326,331	252,506	344,444	180,337	199,256
Commercial	0	0	0	0	0	0	0	0	0	0
Wood	609	120	0	167	39	0	156	336	536	167
Sludge	0	0	0	0	0	0	0	0	0	0
Asbestos	0	12	4	0	0	0	4	0	3	3
PCS	0	16,233	19,179	18,295	846	10,285	60,545	17,265	34,742	319,105
Tires	0	500	0	0	33	618	449	414	471	765
Other	14,486	2,260	740	33,125	58,953	1	600	605	2,039	2,646
TOTAL (tons)	905,088	459,238	377,853	277,433	419,702	600,149	494,528	536,155	477,383	733,843

Table D.3
Waste Types and Amount Disposed at Limited Purpose Landfills 1992-2001

WASTE TYPES	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Municipal	0	0	0	0	0	0	0	0	0	0
Demolition	13,698	12,894	95,568	151,230	180,529	85,916	98,072	84,140	71,203	71,817
Industrial	194,689	17,680	212,008	315,930	371,496	277,419	225,779	262,021	278,224	325,114
Inert	44,572	37,274	104,419	138,577	141,759	109,174	112,714	136,352	205,902	202,577
Commercial	0	25,019	0	0	0	0	0	0	0	0
Wood	94,541	156,261	86,088	58,628	22,660	14,589	7,700	8,853	3,205	6,841
Sludge	0	0	21	0	0	2,275	0	1,103	0	0
Asbestos	0	0	226	797	512	1,310	1,058	1,549	1,654	1,282
PCS	0	99,360	82,279	148,932	98,221	121,066	56,407	8,837	7,159	13,222
Tires	0	0	0	0	29,227	434	559	59	25	41
Other	35,615	59,259	60,642	40,797	65,675	83,600	124,607	66,833	79,291	24,698
TOTAL (tons)	383,115	407,747	642,251	874,116	910,078	695,783	628,896	569,747	646,662	645,592

Table D.4
Waste Types and Amount Disposed at Woodwaste Landfills 1992-2002

WASTE TYPES	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Municipal	0	0	0	0	0	0	0	0	0	0
Demolition	57,328	20,775	0	8,600	18,780	17,718	21,313	25,121	32,182	31,559
Industrial	0	0	0	0	0	0	0	0	15,120	0
Inert	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0
Wood	122,381	96,708	93,310	105,080	81,886	69,498	36,777	75,668	33,452	21,739
Sludge	0	0	0	0	0	0	0	0	0	0
Asbestos	0	0	0	0	0	0	0	0	0	0
PCS	0	0	0	0	0	0	0	0	0	0
Tires	0	0	0	0	0	0	0	0	0	0
Other	1,785	4,614	3,213	2,079	2,031	8,109	1,320	1,695	622	0
TOTAL (tons)	181,494	122,097	96,523	115,759	102,697	95,325	59,410	102,484	87,552	53,298

Table D.5
Per Capita Disposed, Recycled and Generated Numbers
(pounds/person/day)

Per Capita	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Disposed[1]	4.67	4.96	5.07	5.16	5.12	5.16	5.66	5.45	5.73	5.96	5.55
Recycled	2.05	2.30	2.58	2.56	2.56	2.51	2.10	2.05	2.05	2.33	2.48
Generated	6.72	7.26	7.65	7.72	7.68	7.67	7.76	7.50	7.78	8.28	8.03

Table D.6
Total Amounts of Solid Waste Disposed in Washington

DISPOSAL METHOD	1993	1994	1995	1996	1997	1998	1999	2000	2001
Municipal Solid Waste Landfills	3,726,055	3,878,615	4,001,815	4,083,755	4,532,918	4,582,107	4,738,808	4,659,582	4,525,019
Incinerated Waste	431,928	421,626	397,588	365,464	551,006	369,778	461,684	554,780	496,152
Woodwaste Landfills	122,097	32,625	115,759	102,697	95,325	59,410	102,484	87,552	53,298
Inert/Demolition Landfills	834,238	657,614	479,638	873,195	600,149	494,528	536,155	477,383	733,843
Limited Purpose Landfills	407,747	642,251	874,116	910,078	695,783	628,896	569,747	646,662	645,592
TOTAL	5,522,065	5,632,731	5,868,916	6,335,189	6,475,181	6,134,719	6,408,878	6,425,959	6,453,904

[1] Disposed amounts include all waste generated from Washington disposed in MSW landfills and incinerators, both instate and exported.

Table D.7
Solid Waste Imported for Disposal 1991-2001

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Municipal Solid Waste	24,475	27,114	26,933	27,330	111,395	203,180	213,322	235,408	243,292	116,365	100,092
Demolition	1,412	0	147	1,095	6,643	9,904	12,264	14,245	11,529	25,322	4,370
Industrial	0	0	0	4,269	39,990	39,272	358	28,032	39,547	32,044	57,952
Woodwaste	208	27,492	24,486	120	1,897	71	0	207	21	21	2
Sludge	36	34,457	0	33	0	14	1,413	23	0	0	0
Asbestos	0	41	735	206	401	422	39,517	637	478	715	243
Petroleum Contaminated Soils	0	12,388	16,698	33,136	54,839	13,706	12,127	19,831	3,652	1,511	4,910
Tires	0	0	0	0	3,594	7,605	7,895	7,202	2.,228	2,296	1,622
Medical	na	na	Na	Na	Na	na	1,300	1,432	0	0	0
Other	0	0	0	924	210	941	0	828	0	3,131	33
TOTAL	26,131	101,492	69,059	67,113	218,970	275,115	288,196	307,850	300,747	191,405	172,696

Table D.8
Solid Waste Exported from Washington for Disposal 1993-2001

	1993	1994	1995	1996	1997	1998	1999	2000	2001
Municipal Solid Waste	710,515	737,309	709,133	778,107	785,741	801,663	832,421	949,685	915,156
Demolition	2,245	11,130	113,097	137,314	94,905	94,546	92,768	93,540	62,791
Industrial	864	3,034	6,773	20,949	50,158	57,556	112,735	129,986	115,334
Woodwaste	0	0	0	0	0	0	0	0	0
Sludge	0	2,834	5,212	7,062	0	0	0	0	0
Asbestos	1,623	2,709	3,031	2,564	5,440	2,856	3,778	4,439	3,836
Petroleum Contaminated Soils	22,308	7,555	9,760	29,574	39,112	24,999	62,015	54,787	71,460
Tires	Na	Na	0	0	0	0	0	0	0
Medical	Na	Na	Na	5,209	0	5,204	5,474	6,109	4,868
Other	18,512	5,943	4,879	8,394	0	0	0	1,939	1,919
TOTAL	756,067	770,514	851,885	989,173	975,356	986,824	1,109,191	1,240,485	1,175,953