Solid Waste in Washington State

19th Annual Status Report

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Solid Waste in Washington State

Nineteenth Annual Status Report

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Executive Summary

The Washington Department of Ecology's Waste 2 Resources Program has issued the *Solid Waste in Washington State Annual Status Report* for 19 years. The report summarizes many aspects of solid waste management in Washington State.

Ecology continues to strive to reduce the impact of solid waste on human health and the environment. This report is just a snapshot of data showing progress toward meeting this goal. Some key findings of the 19th Annual Status Report include:

- In 2009, the recycling for solid waste rate remained stable at 45 percent. In addition, the overall amount of solid waste diverted from disposal was 55 percent.

- In 2009, the amount of solid waste generated by Washington residents decreased by more than 700,000 tons. This amounts to about 8 percent less municipal waste generated by state residents.

- In 2010, 19,734 tons of electronics were collected for recycling through the E-Cycle Washington Program.

- From 2007-10, 54,832 waste tires were removed from 175 sites using funding from the Waste Tire Removal Account.

- In 2009, almost 6 million pounds of litter were collected statewide.

- In 2009, 29.2 million pounds of moderate risk waste were collected.

As an efficiency measure in light of limited resources, this year's annual report also includes legislatively required reports including:

- Implementation progress on the Mercury Containing Lights Product Stewardship Program (RCW 70.275.140), pages 1-3.

- Electronic Product Recycling Law (Governor Gregoire's veto message on ESSB 6428), pages 29-31.

- Litter Cleanup Program (RCW 70.93.200), pages 73-81.

- Waste Tires Cleanup Report (RCW 70.95.530), pages 49-53 and 137-145.

The report also contains additional information on issues, programs and solid waste data that Ecology tracks. Following is a brief summary of each chapter.

Chapter 1: Issues Facing Washington State identifies some current issues impacting solid waste in the state, as well as new programs and changes underway.

The budget is a significant concern at both the state and local levels. Washington State is experiencing the worst economic times in many years. Reduced revenue is impacting state and local government budgets, and their ability to deliver solid waste services. Many counties have reduced programs and staff. Ecology is under a hiring freeze and rules moratorium that continue to impact delivery of the solid waste system.

Product Stewardship programs are being implemented and developed in the state. In January 2007, Ecology began implementing *Chapter 70.95N RCW - Electronic Product Recycling* by registering manufacturers of desktop computers, portable computers, computer monitors and televisions into the Electronic Product Recycling Program, now known as E-Cycle Washington.

In 2010, the Washington State Legislature passed a law that requires producers of mercury-containing lights sold in or into Washington State for residential use to fully finance and participate in a product stewardship program (*Chapter 70.275 RCW, Mercury-containing Lights – Proper Disposal*). The program is now under development.

Ecology is also developing rules to implement the *Children's Safe Product Act (CSPA)* passed in 2008. We are also evaluating the need to update *Chapter173-350 WAC, Solid Waste Handling Standards*. The process to update the state's solid waste management laws is a significant undertaking.

Chapter 2: Partnering for the Environment summarizes some key efforts underway in the state where Ecology is working to cultivate effective partnerships with businesses, local governments, community organizations, other state agencies, the agricultural community and industry groups.

Many partnerships are helping to implement *Beyond Waste*, the state's solid and hazardous waste plan, which involves a fundamental shift from managing wastes and toxics to prevent them from generation in the first place. Some specific areas include:

- Green building.
- Reducing moderate risk waste.
- Reducing toxic threats.
- Implementing the E-Cycle Washington Program.
- Environmentally Preferable Purchasing.
- Recycling and beneficial use of organic materials.
- Use of anaerobic digestion and waste tire removal programs.

Ecology administers the Coordinated Prevention Grants Program to assist local governments in managing their solid waste programs. Continued stress on the Local Toxics Control Account and reduced funding for grants is impacting the ability of the local governments to deliver solid waste services in some areas.

Ecology also administers Public Participation Grants provide funding to citizen groups and not-for-profit public interest organizations. These grants encourage public involvement in monitoring cleanup of contaminated sites and pollution prevention through waste reduction/elimination.

Chapter 3: Statewide Litter Prevention & Cleanup Programs summarizes litter collection efforts in the state. Those efforts are undertaken by the Ecology Youth Corps (EYC) and partner state agencies of Corrections, Fish and Wildlife, Natural Resources, Transportation, and the Parks and Recreation Commission.

Ecology also administers the Community Litter Cleanup Program (CLCP) with the goal of providing financial assistance to local governments to combat litter and illegal dumps on roadways and other public land.

In 2009, various programs collected almost 6 million pounds of litter statewide. Work on litter control and litter prevention activities in 2010 was curtailed significantly due to budgetary constraints, with an expectation that less litter would be collected.

Chapter 4: Solid Waste Generation, Disposal & Recycling in Washington State includes annual data on the generation, disposal and recycling of solid waste in the state.

The total amount of municipal waste generated by state residents fell by more than 700,000 tons in 2009, or about 8 percent from last year. The recession has affected the amount of waste produced, driving both disposal and recycling down.

In 2009, Washington's recycling rate stayed level at 45 percent. Overall waste diverted from disposal rose to the highest amount ever -- 55 percent in 2009. This is because we are diverting more construction and demolition related materials than we are disposing. Asphalt and concrete accounted for 72 percent of the increase in diversion from landfilling.

Ecology's data showed that recycling rates increased for organic materials such as food scraps, electronics, and nonferrous metals. Materials disposed from the construction, demolition and organics sectors declined in 2009 by more than 1 million tons.

In 2009, recycling materials instead of sending them to landfills helped us avoid emitting 2.8 million tons of greenhouse gases into the atmosphere. Also, recycling saved 132 billion British thermal units of energy. This is equivalent to conserving 1 billion gallons of gasoline – enough to power more than 1 million homes for a year.

Chapter 5: Moderate Risk Waste Management includes data on collection and management of moderate risk waste, a combination of household hazardous waste (HHW) and conditionally exempt small quantity generator (CESQG) waste. HHW is waste created in the home, while CESQG are small quantities of business or non-household waste.

The total MRW collected in 2009 was about 29.2 million pounds. The average amount of HHW disposed per participant was 68.4 pounds, or 2.21 pounds per capita. Approximately 82 percent of all MRW was recycled, reused or used for energy recovery.

The most dominant waste types of MRW collected in 2009 were non-contaminated used oil, antifreeze, oil-based paint, latex paint, lead-acid batteries and flammable liquids.

Chapter 1: Issues Facing Washington State

Budget

Washington State is experiencing the worst economic times in years. Reduced revenue is impacting state and local government budgets and their ability to deliver solid waste services. Many counties have reduced programs and staff. Ecology is under a hiring freeze and rules moratorium which continue to impact the delivery of the solid waste system.

One of our key initiatives over the next year will be to preserve dedicated accounts for solid waste management in Washington State. This includes the preservation of the Waste Reduction Recycling and Litter Control Account for litter pickup and recycling programs, and the Model Toxics Control Account for grants to local governments for implementing solid and hazardous waste management programs.

Product Stewardship Programs in Washington

In January 2007, Ecology began implementing *Chapter 70.95N RCW, Electronic Product Recycling,* by registering manufacturers of desktop computers, portable computers, computer monitors and televisions into the Electronic Product Recycling Program, now known as *E-Cycle Washington*. More information about E-Cycle Washington is found in *Chapter 2: Partnering for the Environment.*

In 2010, the Washington State Legislature passed a law that requires producers of mercury-containing lights sold in or into Washington State for residential use to fully finance and participate in a product stewardship program (*Chapter 70.275 RCW, Mercury-containing lights – proper disposal*). The program is now under development as discussed below.

Mercury-Containing Lights Product Stewardship Program

Chapter 70.275 RCW, Mercury-containing lights – proper disposal, requires producers of mercury-containing lights sold in or into Washington State for residential use to fully finance and participate in a product stewardship program. Producers of mercury-containing lights must also fund Ecology's administration and enforcement costs.

Chapter 70.275 RCW defines a "producer" of mercury-containing lights as a person that:

> *"Mercury-containing lights" include lights, bulbs, tubes or other devices that provide functional illumination in homes, businesses, and outdoor stationary fixtures."*
> (Chapter 70.275 RCW)

a. Has or had legal ownership of the brand, brand name or co-brand of a mercury-containing light sold in or into the state, except for persons whose primary business is retail sales;

b. Imports or imported mercury-containing lights branded by a producer that meet the requirements of (a) and have no physical presence in the U.S.;

c. Makes or made an unbranded mercury-containing light sold in or into the state; or

d. Sells or sold a mercury-containing light at wholesale or retail, does not legally own the brand, and elects to fulfill the producer responsibilities.

Mercury-containing light producers must:

- Finance and participate in an approved product stewardship program by January 1, 2013, in order to sell in or into Washington.
- Pay annual fees of $5,000 to fund Ecology's administration and enforcement.
- Inform consumers how and where to return their lights in every county in the state.
- Charge no fees when the lamps are collected for recycling.

Retailers or wholesalers must:

- After January 1, 2013, check Ecology's website to verify mercury-containing light producers are participating in an approved product stewardship program.
- Not distribute or sell mercury-containing lights from producers who are not participating in a product stewardship program.

Residents and Consumers must:

- Recycle mercury-containing lights. Beginning January 1, 2013, a producer funded recycling program will be available at no charge to anyone dropping off up to 15 mercury-containing light bulbs in a 90-day period. Any business that normally handles mercury-containing lights as hazardous waste must continue to follow those requirements.
- Not put mercury-containing lights in the trash. Mercury lights can release toxic mercury vapor to the air during collection, transport and disposal.

- Find recycling options by:
    - Calling 1-800-RECYCLE (1-800-732-9253).
    - Visiting 1800recycle.wa.gov, Earth911.org, or lamprecycle.org.

Producer Annual Fees

Companies that sell mercury-containing lights in or into Washington State must participate in and finance a mercury-containing lights product stewardship program. Nearly 75 percent of the mercury-containing light sales market is controlled by the three largest producers of lamps: Osram Sylvania, GE Lighting and Philips Lighting.

Each producer participating in an independent product stewardship program is required to pay Ecology an annual fee of $5,000 for administration, enforcement and oversight. In the absence of an approved independent plan, Ecology will establish a state contracted program. Producers are required to pay Ecology an additional $10,000 to fund it.

Annual fees ($5,000 per year) are expected to generate annual revenue of $205,000 for Ecology's administration and enforcement. Start-up funding for the state contracted program is expected to generate $410,000. Producers will need to directly fund any additional costs incurred by a state contracted organization.

Product Stewardship Program Cost Estimate

The product stewardship program could collect more than three million mercury-containing lights each year. Collection, transportation and processing is expected to cost less than $1 per light ($0.60 for each CFL and $0.48 for a 4-foot linear). A mercury-containing lights product stewardship program in Washington could cost $3 million a year.

Future Regulatory Changes in Washington

The Waste 2 Resources (W2R) Program is developing new rules to implement the Children's Safe Product Act. It is also revising two existing regulations: *RCW 173-350 WAC, Solid Waste Handling Standards* and *RCW 173-351 WAC, Criteria for Municipal Solid Waste Landfills.* W2R is also evaluating changes to the Landfill and Incinerator Operator Certification program as required by C*hapter 70.95D RCW*, *Solid Waste Incinerator and Landfill Operators.* W2R is finalizing procedures for terminating post-closure maintenance and monitoring under various regulations. These activities are discussed below.

On November 17, 2010, Governor Gregoire issued an Executive Order that temporarily suspended non-critical rule development until January, 2012. Ecology has made an initial determination of which rulemaking should move forward and which should be delayed for a year. The status of each rule in process is identified below.

Children's Safe Product Act

The state's Children's Safe Product Act (CSPA) was signed into law in 2008. Since then, Ecology worked with our partners -- product manufacturers, nonprofits, consumers, environmental and health organizations, and other state agencies -- to develop the needed guidance to carry out this groundbreaking law.

In October Ecology opened the formal comment period on the draft rule to implement *Chapter 70.240 RCW, Children's Safe Products*. This step followed a pilot project phase, when a volunteer group of product makers helped Ecology learn how to best structure the chemical reporting process called for under the law.

Despite the moratorium on rule-making recently announced by Governor Gregoire, Ecology identified the Children's Safe Product rule as one necessary to proceed under the criteria set out by the Governor's Office.

First Chemical Reporting List

CSPA required Ecology, in consultation with the Washington State Department of Health, to develop a list of chemicals that must be reported. Under the law, after Ecology issues the final rule to implement CSPA, manufacturers of children's products must report to Ecology if their products contain any of those chemicals.

The list of 59 chemicals can be found in the rule. The list is dynamic. Ecology may change the rule to update the list in the future as new information becomes available (although no sooner than once every two years). As required by the law, all of the chemicals on the list are toxic and have either been found in children's products or have been documented to be present in human tissue (blood, breast milk, etc.).

"However, just because a chemical is present in a product does not mean that children are being exposed to it or harmed by it," said Carol Kraege. *"Children's products are just one way that children might be exposed to a harmful chemical."*

The CSPA rule applies to companies that make children's products like toys, cosmetics, jewelry, baby products and car seats. The largest manufacturers that make products likely to be placed in a child's mouth or on their skin, or products for children age 3 and under must report first. Other manufacturers would report according to a phased-in schedule in the rule.

Retailers who only sell – but do not make or import – children's products are not subject to the rule.

Understanding How Chemicals are Used

The comment period for the CSPA draft rule runs from October 22 through December 31, 2010. A public hearing was held at Ecology's Lacey building on December 9. Ecology staff expects to adopt the rule by March 15, 2011. Ecology expects to receive the first reports from manufacturers in spring 2012.

"Rather than looking at just one chemical at a time in an individual product, Ecology will collect information that will help us understand how chemicals are being used in a wide range of product categories," Carol Kraege said. *"Reporting on the use of toxic chemicals is the first step toward getting safer products for children. Reports under this law will help policy makers decide if further actions are needed."*

For more information, see the Children's Safe Product Act web page.

Solid Waste Handling Standards Rule Update

In May 2009 the W2R Program began the process to update *Chapter 173-350 WAC, Solid Waste Handling Standards*. This rule sets minimum functional performance standards for the proper handling and disposal of solid waste originating from residences, commercial, agricultural and industrial operations and other sources. The rule has not been updated since 2005 and some requirements are outdated. Others need clarification, such as organics management and the composting section. Examples of other areas that may need to be revised include:

- ✓ Add new soils/earthen material section to clarify when a material is a solid waste.
- ✓ Clarify definitions.
- ✓ Revisit exemptions.
- ✓ Clarify processing or performance standards for solid waste facilities.
- ✓ Streamline administrative requirements.

Chapter173-350 WAC, Solid Waste Handling Standards, was on a "to be determined" list of rules that may proceed during the 12-month moratorium on rule making. More information about the rule is available at http://www.ecy.wa.gov/programs/swfa/rules/rule350.html.

Criteria for Municipal Solid Waste Landfills Rule Update

Ecology is also amending *Chapter 173-351 WAC, Criteria for Municipal Solid Waste Landfills*. This rule was identified by Ecology's Director as one that will proceed in 2011.

The Environmental Protection Agency (EPA) amended *40 CFR Part 258*, the federal rule that allows states with approved state programs to provide variance from certain criteria for municipal solid waste landfills (MSWLF) to issue Research, Development and Demonstration (RD&D) permits for new and existing MSWLF units and lateral expansions. Ecology needs to adopt these federal regulations so Washington can achieve full approval of its solid waste program.

The rule making will propose amendments to:

- Adopt new federal regulations and allow for issuance of Research, Development and Demonstration (RD&D) permits. It implements *40 CFR Part 258.4*, allowing introduction of water or other liquid wastes.

- Eliminate equivalent and arid design. The current requirements are a standard design (geomembrane with 2 feet of compacted clay) or an "equivalent" design that apply to non-arid locations, and a performance standard that applies to aid locations. The proposed requirements align with *40 CFR Part 258.40* with a composite liner (identical to current "standard design"), or an "alternative" design meeting performance standards that apply to all locations. The approach for the alternative design is very similar to the existing arid design standard.

- Extend greater flexibility for alternate liner designs consistent with federal regulations.

- Address general housekeeping issues such as providing clarifications, formatting changes, and ensuring the rule is consistent with *RCW 173-350 WAC, Solid Waste Handling Standards.*

The anticipated revisions will impact all municipal solid waste landfill facilities in the state.

Changes to the Landfill and Incinerator Operator Certification Program

Washington State law requires solid waste landfills and incinerators to have certified operators onsite at all times (*Chapter 70.95D RCW*, *Solid Waste Incinerator and Landfill Operators*). The Legislature created the Landfill and Incinerator Operator Certification Program in 1989, through the *Waste Not Washington Act.* To carry out the law, the state adopted a rule in June 1991 (*Chapter 173-300 WAC, Certification of Operators of Solid Waste Incinerators and Landfill Facilities*).

Requirements for having certified operators onsite at all times apply to the following types of facilities:

- ✓ Municipal solid waste landfills.
- ✓ Inert landfills.
- ✓ Limited purpose landfills.
- ✓ All incinerators that burn solid waste.

The law also requires that any person officially inspecting these solid waste facilities must be certified under the program.

Originally Ecology developed the course curriculum and administered the tests. Because of staff and budget reductions, in February 2004 Ecology reached an agreement with the Solid Waste Association of North America (SWANA) to conduct the training, testing, continuing education, recertification and program administration for landfill certification. SWANA annually provides Ecology with a list of currently certified persons. Ecology notifies interested parties of upcoming training and testing. The incinerator certification program continues to be Ecology's responsibility.

One of the concerns with the current certification program is the focus on national issues and regulations. There is no specific focus on Washington requirements. The SWANA curriculum focuses on topic areas such as landfill siting and surveying that do not add to compliance or environmental protection.

There are also issues with cost and travel restrictions for local governments with increasing budget restrictions. For some it would be beneficial to obtain certification for operators and inspectors without traveling or taking a test.

Also, many landfill operators do not have the technical skills to pass a SWANA test even though they are quite capable of safely operating a landfill and compliant with applicable rules. Some want Ecology to find a different route for certification.

There is a proposal for Ecology, health districts and counties to develop their own curriculum and program, and offer training and testing. This would give an alternate path to operators and inspectors to obtain certification and meet requirements of our rule.

Ecology staff will work with a committee of interested parties to move forward in the next year.

Updating Solid Waste Laws

In 2009, Ecology started a process to update the state's solid waste management laws. While there are about 80 laws that address solid waste management in some way, the main law is *Chapter 70.95 RCW, Solid Waste Management – Reduction and Recycling*. The update process, while focused chiefly on *Chapter 70.95 RCW*, may also involve some of the other laws to ensure an effective, coordinated statewide solid waste management program.

Originally passed in 1969 and amended 29 times since then, *Chapter 70.95 RCW* has greatly improved the way we manage our waste. It has helped our state become a national leader in waste management.

Our waste is now sent to "sanitary landfills" -- typically large regional landfills in eastern Washington and Oregon. Waste collection is available for all who want it. Thanks to significant recycling revisions in the law, Washington's 45 percent recycling rate is one of the highest in the country. And this law places waste reduction as the highest priority for waste management in Washington State.

However, while our waste management laws are good, they have not fully kept up with changes in the waste stream. Waste reduction remains our biggest challenge. How do we not make the "waste" in the first place? How do we fund our waste management system as we successfully reduce waste, which is the main source of funding? For these reasons and more, Ecology recognized our laws need to better address current waste management challenges and help move us "beyond waste."

Ecology developed a three-step process to update state solid waste laws:

1. Identify problems.
2. Find solutions.
3. Make changes.

Of course, each step involves many smaller steps. This will not be an easy process, and we expect it will take a number of years.

Step 1 – Identify Problems

In spring 2010, Ecology met with the public and staff to identify problems with current solid waste management laws. Ecology hosted multiple workshops across the state to listening to issues and problems, and gain perspective. The thousands of comments received from the 200 participants can be reviewed at http://www.ecy.wa.gov/programs/swfa/7095/.

Based on these comments, Ecology crafted analysis and summary documents. Many problems were identified that generally fall into the following overarching themes:

- ✓ Financing.
- ✓ Enforcement.
- ✓ Infrastructure and Materials Markets.
- ✓ Public Awareness and Education.
- ✓ Waste Reduction.
- ✓ Packaging and Products.
- ✓ Government "Walk the Talk."
- ✓ Definitions.
- ✓ Measurement.
- ✓ Roles and Responsibilities.

Each of these themes contains many subthemes which were detailed in the summary documents.

In fall 2010, Ecology shared the summary documents with the public to get feedback on the issues and prioritize issues. Did we miss anything? And since we cannot address all issues at once, where should we start? Using this feedback, we will update the summary documents, and propose priority solid waste issues for Step 2 - Find Solutions.

Step 2 – Find Solutions

In spring 2011, Ecology plans to move to the solutions phase. Our focus will be priority issues identified in Step 1 that involve amendments to the law. Rule-related issues will be referred to the rule-making process. Ecology will identify issues not suitable for either law amendments or rule revisions. With help from stakeholders, Ecology will start identifying and researching a variety of potential solutions for priority problems. Eventually, we will need to choose among the proposed solutions to draft changes to legislation, which is where things will really get interesting!

Step 3 – Make Changes

When ready, likely not until 2013 or beyond, Ecology will draft legislative revisions to incorporate solutions into law. This will likely not be a one-time process, but legislative changes may be proposed over multiple years.

Where We Want to Go

In 2004 and 2009, Ecology worked with stakeholders to create and then update the *Beyond Waste Plan*; our state plan for managing solid and hazardous wastes. It set a 30-year vision to eliminate most wastes and toxic substances, and use any remaining wastes as resources. In 2008, the Climate Action Team identified waste reduction and recycling as strategies that greatly reduce greenhouse gas emissions.

To reduce greenhouse gasses and achieve the Beyond Waste vision, we need to increase waste reduction and recycling. Our current solid waste laws do not fully facilitate this. Updating our solid waste laws can help eliminate waste wherever possible, reduce product toxicity, recycle more materials, and safely dispose of residuals. This is our ultimate goal for the law update process.

Anyone interested in this process should sign up on the RCW 70.95 listserv to receive email updates. Information on this process, including meeting notes and summary documents, is available at http://www.ecy.wa.gov/programs/swfa/7095/.

Post-closure Maintenance and Monitoring Requirements for Landfills

When a landfill ends its operating life and no longer accepts waste, it is critical to close the site following specific requirements to protect human health and the environment in the future. Currently, municipal solid waste (MSW) landfills are permitted under *Chapter 173-351 WAC, Criteria for Municipal Solid Waste Landfills*, while limited purpose landfills are permitted under *Chapter 173-350 WAC, Solid Waste Handling Standards*.

Prior to issuance of the current regulations, both MSW and limited purpose landfills were permitted under *Chapter 173-304 WAC, Minimum Functional Standards for Solid Waste Handling (MFS)*. Under each of these regulations, maintenance and monitoring of closed landfill sites are required for an extended period to ensure the closure continues to provide protection of human health and the environment.

Most landfills that closed under the MFS were required to plan for and fund a 20-year post-closure period of maintenance and monitoring. Many are now at or approaching the end of that time. Although the MFS calls for operators to plan for a 20 year post-closure period, it requires that post-closure activities of maintenance and monitoring of air, land and water continue as long as necessary for the facility to stabilize and protect human health and the environment. Operators of these landfills and the local authorities that permit them are confronting the need for guidelines to determine when post-closure maintenance and monitoring can be discontinued.

Ecology has developed a fact sheet to answer questions on procedures for terminating post-closure maintenance and monitoring for landfills under the MFS. The fact sheet suggests approaches to evaluating monitoring data against the MFS criteria of "little or no settlement, gas production or leachate generation" for a stabilized landfill site. It also discusses the relationship of solid waste permitting to other environmental permits for post-closure landfills, such as wastewater discharge and air emission permits.

Ecology is also looking more closely at the related financial assurance issues for MFS landfills – updating cost estimates, tracking post-closure activities and costs, and submittal of annual audit reports.

Current Materials Management Issues

Compost Facility Capacity and Organics Management

Tipping the landfill scales at more than 900,000 tons per year, food waste represents approximately 18 percent of all materials disposed in landfills. And, as indicated by the 2009 Washington Statewide Waste Characterization Study, food waste and other organic materials, woody debris, paper packaging and paper products make up more than 55 percent of the total waste stream. At more than 2.7 million tons, organic material continues to swamp our landfills.

The state, local governments and businesses have responded to this huge amount of organic waste going to landfills by increasing collection programs. While these extra programs improve our recycling rates and decrease organics going to the landfill, they may also be straining some regional compost facilities. *Statewide* compost facility capacity exists to process every scrap (and more) of collected organics, but most organic materials stay within their region of origin. This leaves some facilities located in the regions with dense populations and aggressive collection programs, straining at the seams, while others may be operating below capacity.

In addition to new organics collection programs, many programs now collect more diverse materials, such as food waste, soiled paper and some compostable plastics. Adding food waste and other compostable materials to the mix is the next logical step toward reducing waste going to the landfill. However, food waste may cause problems at some existing compost facilities. It rots very quickly, compounding odor issues, and is associated with increased contamination (plastic, metal, glass).

In 2009, compost stockpiles grew as markets for finished compost shrank. At some facilities, finished product storage encroached on processing areas, adding to capacity and odor concerns.

Facility capacity and organics management issues are complex:

- Even with Washington's progressive organics composting programs, our landfills are still packed with organic material. Much of it is food waste.
- We rely heavily on composting as the primary method of managing organics, yet capacity to process material at some facilities may be at its limit.
- Perceived or real, increased odors associated with composting have created public opposition, slowing or halting expanded or new compost facility development in areas that need more capacity.
- Other processing technologies, such as anaerobic digestion, pyrolysis, and gasification are not yet competitive with composting or widespread.
- Compost markets have been weak, crowding general facility capacity and reducing revenues.
- Adding food waste to the compost mix is relatively new, and may be compounding odor issues and concerns with finished product quality.
- Reducing food waste and increasing edible food recovery programs could take pressure off existing and developing organics processing technologies, but it is difficult to measure the effectiveness of these programs and promote them.

There are no easy responses to these issues, but here are some recommendations:

- Create programs modeled after other successful programs that reduce food waste and redirect edible food to feed hungry people.

- Keep existing compost systems viable by:

  - Educating the public to keep the organics stream free of contamination.
  - Purchasing compost to improving markets for finished product.

- Create long-term plans for keeping organic matter out of landfills by:

  - Evaluating the beneficial use of different organic materials.
  - Supporting sustainable technologies that extract the most value from different organic materials.

Each year we keep more and more organic matter from going into our landfills. Our challenge is finding ways to better use these materials and keep pace with this diversion. We can do this by supporting waste reduction, preserving existing systems and developing new processing technologies for organic matter.

Managing Forest Biomass

Management of forest biomass is an emerging issue facing the Department of Ecology in 2010-11. Forest biomass is the wood waste left onsite as the result of forest management activities including:

- Thinning.
- Pruning.
- Logging.
- Management practices that improve forest health or reduce wildfires.

Forest biomass *does not include:*

- Wood treated with creosote and other chemicals.
- Wood from old growth forests.
- Wood required to be left onsite under the state *Forest Practices Act*.
- Municipal solid waste.

Forest biomass is seen as a source of renewable energy that reduces our dependence on fossil fuels, especially from foreign suppliers. It is a strategy compatible with Ecology's Beyond Waste objectives for organic material. It also may help Washington utilities meet requirements to produce a large percentage of their electricity from renewable sources like solar, wind and biomass. Washington voters approved this standard in 2006 as part of *Initiative 937*.

Several facilities have proposed burning forest biomass to use as fuel or for energy recovery, creating regulatory and permitting issues. Ecology's regulatory responsibility for biomass facilities includes air and water permitting and resolving questions over applicability of solid

waste management requirements to facilities proposing to use these fuel sources. There are proposed facilities in each of Ecology's region. For more information about proposed facilities in your region, contact an Ecology Regional W2R Section Manager. Contact information for each region is listed at the beginning of this document.

Beyond the Curb – What Happens to Commingled Recyclable Materials Collected in Southwest Washington?

In March 2009, Ecology followed up on the previous effort of EPA's Region 10 Initiative, *Contamination in Commingled Recycling Systems Standards & Guidelines*, by holding a statewide kickoff meeting for the Washington Commingled Recycling Improvements Project. The kickoff meeting resulted in local governments agreeing to collaborate regionally to address reducing contamination in commingled recycling systems in Washington State.

Each regional workgroup (Southwest, Northwest, and Eastern/Central) agreed to involve all stakeholders - local governments, material recovery facilities, haulers and end-users - and decide regionally on their approach and objectives.

Below is an update on the work accomplished by the Southwest Region Workgroup (Workgroup) through 2010 and its next steps. Future efforts for the Northwest and Eastern/Central Workgroups will be determined when staff resources allow.

The Workgroup convened in April 2009 and began the process with a shared understanding of similarities and differences of the commingled collection programs in the region. The Workgroup identified which processors were receiving material flow from each jurisdiction.

They determined their overall objective was to address contamination and material loss in single-family, residential, commingled curbside recycling programs in Clark, Grays Harbor, Lewis, Mason, Pierce, and Thurston counties, and the cities of Longview and Port Angeles. A fact-finding mission was the first step for the Workgroup to meet their agreed upon goals:

1. Obtain the knowledge necessary to make informed decisions on programs.

2. Provide data and context to elected officials.

3. Provide consistency in public education messages (including dangerous items like sharps).

4. Reduce problems in sorting at material recovery facilities (MRFs).

5. Create feedback loops, both positive and negative, for the system as a whole.

6. Identify possible funding mechanisms for increased public education.

Monthly half-day meetings were held where all stakeholders shared their perspectives on issues they face with each material. Based on information presented over the course of a year, the Workgroup identified seven key issues that contribute to contamination in the commingled system in Southwest Washington:

1. Consumer awareness and level of responsibility - their reasonable expectation that if it goes in the cart, it is recycled.

2. Glass is a contaminant in the commingled stream and very little is going back to glass.

3. Plastic film has significant processing issues and the result is very dirty ('MRF film').

4. MRF employee safety regarding sharps, other medical waste and explosives.

5. Lack of consistency in our programs and messages across the region.

6. Lack of product stewardship/producer responsibility for materials.

7. State and federal goals are driving local diversion goals.

Recommendations based on the above key issues, as well as detailed summaries for each material, are available in a report entitled *Beyond the Curb – Tracking the Commingled Residential Recyclables from Southwest WA* (http://www.ecy.wa.gov/biblio/1007009.html).

Before resuming their monthly meetings in early fall 2010, it was decided to invite other jurisdictions and industry representatives who support the key issues and recommendations to join the process as it moves forward. The renamed Expanded Southwest Commingled Workgroup met on September 15 and gained 20 new members, representing 16 jurisdictions and businesses. For questions about the report or the Washington Commingled Improvements Project, or to join the Expanded Southwest Commingled Workgroup, please contact Shannon McClelland at 360-407-6398 or Shannon.McClelland@ecy.wa.gov.

Chapter 2: Partnering for the Environment

Building strong partnerships underlies the success of Ecology's Waste 2 Resources (W2R) Program. The W2R Program has worked hard to cultivate effective partnerships with businesses, local governments, community organizations, other state agencies, the agricultural community and industry groups across the state. By working together, groups can offer their unique perspectives and resources to move toward an economically, environmentally vibrant future in Washington.

The Beyond Waste Plan – Partners and Progress

Beyond Waste, the state's solid and hazardous waste plan, involves a fundamental shift from managing wastes and toxics to prevent them from generation in the first place. Any wastes that cannot be eliminated can become resources for closed-loop recycling systems. The plan focuses on hazardous materials and wastes, organic materials, and green building. Recognizing that existing wastes need proper, safe management, the plan also addresses current hazardous and solid waste management systems.

The Beyond Waste Vision
We can transition to society where wastes are viewed as inefficient and most wastes and toxic substances have been eliminated. This will contribute environmental, economic, and social vitality.

The original Beyond Waste Plan was published in 2004. The first five-year update was completed in October 2009. The update includes some new recommendations and milestones.

Implementation Underway on the Plan Update

With publication of the 2009 Update of the Beyond Waste Plan, efforts began on some of the new milestones and recommendations. Ecology and some of its many partners are working on the following:

- Evaluating the Beyond Waste Progress Report indicators and making recommendations for improvements.
- Researching components related to the best use of organic waste materials to create an Organics Resource Map and hierarchy.

Why Beyond Waste?
Avoiding wastes and the use of toxic chemicals is the smartest, cheapest and healthiest approach to waste management.

- Working to align laws and regulations with the Beyond Waste Vision.
- Proposing legislation to make environmental attributes key considerations, along with price and performance for state purchases.

- Implementing the new product stewardship law for mercury-containing lights.
- Completing the first statewide waste characterization study in six years.
- Implementing a lead wheel weight ban.
- Assisting state and national officials with understanding and implementing green building practices.

For more information on progress, see the *Beyond Waste* Progress Report, a set of 16 indicators that track effects of reducing wastes on our environment, economy and society. The plan and Progress Report are available at www.ecy.wa.gov/beyondwaste/.

Fostering Sustainable "Green" Building

Why Build Green?

One of the key initiatives in Ecology's Beyond Waste Plan is an emphasis on 'Green' or more sustainable building. The Green Building Group (GBG) was formed in response to the Beyond Waste Plan with representation in each of Ecology's regions.

The GBG's primary mission is to make green building mainstream in Washington State, thereby saving significant quantities of energy, water and material resources over the life of such buildings. Green building also lowers the amount of solid and hazardous waste generated by construction – our largest landfilled waste stream by weight. Green building lessens the damage to site hydrology from hardscape and storm water, and prompts people to live more sustainably.

The growth of green building in our state is already demonstrating it promotes a healthy economic future, as well as a healthful lifestyle in Washington.[1] This is why green building is seen as such a vital part of Beyond Waste.

The New 'Green' Initiatives

The sixth year of the Beyond Waste Green Building (GB) Initiative was completed. During the first five years, seven of the eleven original milestones were met. Then, as this period ended in 2009, the GBG worked with stakeholders to update this initiative and set new goals for the next five years. These new milestones are intended to be more measurable, integrate other Ecology priorities, and further work in those areas already identified where greater success could be achieved. The milestones are:

[1] A study by Green Works Realty working with Built Green and King County on certified green homes showed that even in an economic slump, these homes hold their value better than conventionally-built houses, selling "faster for more value (http://greenworksrealty.com/e-cert_report/e-cert_report.php?t=e-cert_report).

- Washington continues to be a leader in green building.
- All new state-funded buildings continue to meet or exceed green building requirements.
- Government continues to identify and remove regulatory barriers to green building.
- Green buildings occupy 15 percent of the total market share for new construction in Washington.
- 10 percent of all certified green building projects achieve credits for use of existing building stock, use of salvaged materials and/or at least 75 percent waste diversion during construction.
- Washington offers degree and certificate programs in green building related trades statewide.
- At least five buildings are built to the Living Building standard in Washington.
- At least 50 percent of all local governments in Washington have adopted green building policies and/or incentives.
- A certification system for green building materials effectively provides verification that products are manufactured in compliance with product stewardship and sustainability principles.
- Authorities adopt policies that require low-impact development (LID) strategies to be integrated into building design and maintenance.
- Energy use in public buildings meets or exceeds Architecture 2030 goals.

Contributions to State Goals

Green building practices are increasingly recognized as advancing Washington's Priorities of Government (http://www.ofm.wa.gov/budget/pog/):

- *Value world-class student achievement.* Studies of green schools have demonstrated increases in test scores, as well as student health.
- *Improve health and support of Washingtonians.* Studies of green workplaces continue to show drops in absenteeism and turnover, and significant increases in productivity. Green homes lower likelihood of onset of asthma and asthma attacks. Green hospitals report shorter patient stays, greater health for hospital workers.

- *Provide for public safety.* The greater energy-efficiency and conservation in green buildings alone offset some of the increasing need for and dependence on imported carbon-based fuels. Toxic releases to the environment or to landfills are either cut dramatically or eliminated, as compared to those occurring during or resulting from conventional construction and building products manufacture. Green communities have a significantly smaller carbon footprint than their conventional counterparts.

- *Protect natural resources and cultural/recreational opportunities.* Particularly with water -- the amount used and its treatment (e.g. infiltration onsite reduces storm water pollution and need for infrastructure). Both urban and non-urban environments benefit from green emphasis on low impact development, enhancement of damaged environments, and protection of the existing natural ones.

- *Promote economic development.* Numbers as well as types of green-collar jobs related to the new green movement continue to appear. Green certifications encourage and award buying locally-manufactured items.

- *Improve state government efficiency.* Greater productivity and less absenteeism among state employees working in green public buildings, as well as reduced maintenance costs and greater operating efficiencies, contribute to a better bottom line for the state and more effective operation.

The GBG's Work

Since it has been shown that *waste prevention* results in significant time and money saved, and since prevention requires demonstrating better methods than those previously used, there are three major areas in which we work:

- *Public involvement and education.* We speak, giving presentations to groups region-wide and at conferences; facilitate charrettes (see page 19) and other public involvement meetings, and develop workshops to train organizations and individuals new to green building.

- *Public support.* We offer our expertise, agency awareness and networks by serving as members of nonprofit organizations aligned with our goals; collaborate with business in finding ways to establish a triple-bottom line; and give technical assistance on Public Participation Grants, green products and procedures to the public requesting help with green goals.

- *Public service.* We find ways to partner in reducing jurisdictional barriers to better construction and development techniques; and expand green networks, intergovernmental relationships and public-private partnerships toward accomplishing joint environmental goals.

GBG's Activities for the Year

Public Involvement Presentations

The following represents our broadest public outreach and collaboration with various organizations and jurisdictions.

- *Rainwater Policy, LID, and Code Change* presentation with Snohomish County Surface Water Management at Edmonds Community College.

- *Methods for Changing Codes* presentation with the City of Kirkland at the King County GreenTools Sustainability Roundtable.

- *Building Codes and the Triple Bottom Line Panel* with Washington State Building Code Council and Martha Rose Construction at Renton Technical and Bellevue Colleges.

- *Blocks and Breakthroughs to LID: Getting it done* training presentation with King County Water and Land Resources Division and Salmon Safe for the "Low-Impact Development and Habitat Protection" seminar at Bellevue City Hall.

- *Sustainable Construction* presentations (two) given for the Spokane Community Colleges' Hagan Center for the Humanities.

- *Green Building Resources for Brownfield Redevelopment* presentation with the Environmental Protection Agency, the City of Tacoma, Tacoma/Pierce County Health Department and Ecology's Toxics Cleanup Division speaking in the National Brownfield Association's Executive Forum on Strategic Redevelopment of Urban Centers held in Tacoma.

- *Going Greener for Homeowners* demonstration with ESP Consulting Services at the Bellevue Home Show.

- *Green Job Opportunities in the Construction Industry* presentation for Youthbuild Spokane.

- *Sustainable Building and Associated Health Implications* panel organization and moderation with Cascadia Green Building Council and Island County Public Health at the Joint Conference of Public Health held at the Yakima Convention Center**.**

Charrette Facilitation

Green building is different from conventional buildings in its processes as well as results. A *charrette* is one of those primary 'green' processes that ensures the resulting product is energy, water and material efficient, as well as healthy for occupants and kinder to the environment. These stakeholder meetings are usually held at the beginning of any green building project to determine green project goals and iron out difficulties in purpose or design.

GBG staff facilitates charrettes for public building or publicly funded projects affected by *Chapter 39.35D RCW.* Our services include technical assistance, facilitation and a written, illustrated post-charrette report with recommendations. This year the GBG conducted three charrettes:

1. *Yakima Area Arboretum Eco-Charrette* for their future nature/education center. GBG staff prepared and facilitated a well-attended community charrette partnering with Central Washington Built Green. The Arboretum is currently conducting a feasibility study for a capital campaign for the project and entering into a contract with their prospective architect. LEED® certification is their target.

2. *La Fortuna Integrated Design Charrette* for a permitted five-acre parcel in southeast Renton for development of 43 units of affordable housing for 2 Habitat for Humanity (HFH) affiliates. GBG staff prepared and facilitated an *integrated design* charrette with Habitat WA due to the advanced stage of the project. The building permit is already approved; roads, power and sewer are already installed; and significant critical areas need protection.

3. *HFH Carnation Affordable Housing Project Eco-Charrette* for the East King County Affiliate developing their first 'greenfield' project. GBG staff mentored two AmeriCorps volunteers in planning and facilitating a charrette focused on low-impact development (LID). Half of the donated site (5+ acres) is ideal for 14 single family homes, and the other half is forested and steep, best for keeping *un*developed (one of the best LID techniques).

Charrette participants visit site

Workshop Delivery

In addition to presentations and charrettes, we are available to create green-building-related workshops of varying lengths for jurisdictions, organizations and conferences.

- *Integrated Design for Habitat's Construction Managers*, *Tacoma.* Considered the method by which high-performing buildings can be achieved and made even better, integrated design is a series of charrettes held strategically during all phases of the building process, to discover – then ensure – synergies occur among a building's systems. GBG staff co-presented with Habitat WA on how the integrated design process (IDP) works, what it takes to use it and why one would want to.

- *Green Construction: Alternate Methods and Materials for the Washington Association of Building Officials (WABO) education day, Southcenter*. GBG staff prepared and delivered a multi-format workshop on what's important for building inspectors/officials to know about 'green.'

After a comprehensive introduction, which included a well-produced PowerPoint and David Eisenberg's DVD, Building Codes for a Small Planet, executive heads/representatives of certifying organizations (LEED®, Architecture 2030 Challenge, Built Green®, Evergreen Sustainable Development Standard, Passive House, Living Building Challenge) presented in a moderated panel descriptions of these primary certifying choices available in our state.

Afterward, expert individual presenters discussed code challenges of onsite wastewater treatment, pervious pavements and indoor environmental quality. The day ended with a show and tell of common green materials and processes.

Public Support

Group Participation

Many organizations are instrumental in fostering sustainable building in the state. A key part of GBG work is partnering with these groups to further their activities with technical assistance, planning and in-kind work, often as Board or Steering Committee members. Click on the links provided for more details about each of these partners.

- *Northwest EcoBuilding Guild.* GBG serves on the Guild's Executive Committee of the Regional Board of Directors, and as Olympia and Yakima Chapter members. http://www.ecobuilding.org.

- *Habitat for Humanity.* Technical assistance, charrette services, and support for a feasibility study of a new Habitat Store proposed in Bellevue or Redmond. http://www.habitatwa.org/.

- *Built Green® Washington and local Built Green chapters.* Service on Executive, Steering, marketing and checklist revision committees in various groups. http://www.builtgreenwashington.org/.

- *Green Building Councils:*

  - *United States Green Building Council (USGBC*). Participating member. http://www.usgbc.org/.
  - *Cascadia Region Green Building Council.* Branch Steering Committee member, Government Confluence table captain, technical assistance. http://cascadiagbc.org/.
  - *LEED® User Groups.* Participating members.

- *National Sustainable Building Advisor Program®.* Board Vice President, Committee Chair: http://www.nasbap.org/.

- *Washington State Recycling Association.* Board member. http://www.wsra.net/.

- *Sustainable Development Task Force of Snohomish Coun*ty. Steering Committee member. http://sustainablesnohomishcounty.net/.

Demonstration Projects and Other Public-Private Sector Efforts

GBG staff plan these activities to foster collaboration among sectors that wider adaption of green building requires. "Greening" public buildings encourages greater private investment in green and vice-versa.

- *Low Impact Development (LID) Display Garden at the Northwest Flower and Garden Show at the WA Trade and Convention Center.* Designed by Innovative Landscape Technologies and funded by Washington State Nursery & Landscape Association (WSNLA) with the Partnership for Water Conservation.

  GBG staff conducted tours pointing out the exhibit's LID 'steps': the green roof feeding a vertical bladder rainwater-harvesting system hidden behind a 'living fence' of cedar and coastal strawberries; an attractive rain garden held in place by the tiered retaining wall of new black compost 'socks'; and between the two, a path of a new aggregate porous pavers - the feature most commented on by visitors.

- *Snoqualmie Gourmet Ice-Creamery Sustainability Fair.* Staff organized the children's composting and LID table at the business first to install LID strategies in Snohomish County.

- *City of Spokane's Energy Solutions Workshop.* Staff provided information on the built environment and potential energy impacts associated with buildings in a 1 ½ day workshop that began the city's long-term planning process on energy solutions.

- *Bellevue Home Show seminars feature 'Green'.* GBG staff organized four 45-minute seminars on sustainability featuring top-quality presenters on remodeling, porous pavement applications and rainwater harvesting.

- *International code expert David Eisenberg brought to Spokane.* Staff coordinated sponsorship with the Cascadia Green Building Council and local firms interested in green building for four presentations and meetings on greening building codes.

- *Green Building Resource Center.* Staff coordinated with the city of Spokane and the Emerging Green Builders to design and develop a permanent green building resource center in the city of Spokane's Building and Planning Department.

- Three green building demonstration projects were completed in Central Region this year:

  - *Healthy Home in the Valley, Selah.* http://www.sustainabilityfoundation.com/files/22.pdf.
  - *Green Access Home at Suncadia, Roslyn.* http://www.djc.com/news/en/12021729.html.
  - *Green Built Garden Shed, Yakima.* Staff toured and applauded their owners and crew for walking their walk!

Yakima's Green Built Garden Shed

Reducing Barriers

Reducing barriers to high-performance building is one of the toughest, yet most important aspects of our work. It requires the focused, collaborative efforts of and partnerships among public, non-profit and private entities.

This year a new interpretation to state water use policy on rainwater harvesting was announced. It permitted the *de minimus* collection and domestic use of rain falling on a roof of a structure, provided the roof was not designed solely for rainwater collection. See http://www.ecy.wa.gov/programs/wr/hq/rwh.html.

Staff spent many hours explaining the old, restrictive interpretation to green builders, and working for change to the policy by bringing the issues to the attention of the Water Resources Program. It was with delight we spread the news of the new interpretation to our green building network.

Thurston County's survey to identify barriers to building green found that cost, the Building Code, and inadequate appraising were the biggest barriers. Staff participated in the county's "Green Codes" Development Taskforce meetings, where code barriers, incentives, education, jobsite recycling, electric-vehicle-charging infrastructure, green building review policy, cottage housing, and solar energy were discussed. Stakeholders agreed that barriers lie within the building review process rather than requirements of the Building Code, so the county drafted a new green building policy that:

- Recognizes the green building certificate programs familiar to local builders and architects.
- Creates a green county permit review team.
- Creates a database of green innovative building techniques uncommon at present in the local building industry.
- Plans to record a Green Certificate with the property's title to document the certification, adding value to the home.
- Proposes a five or six-year "green building" property tax exemption on half the property taxes on a green house, similar to the one the Thurston County now allows on remodels to existing homes (http://www.co.thurston.wa.us/planning/climate/climate-grnbld.html).

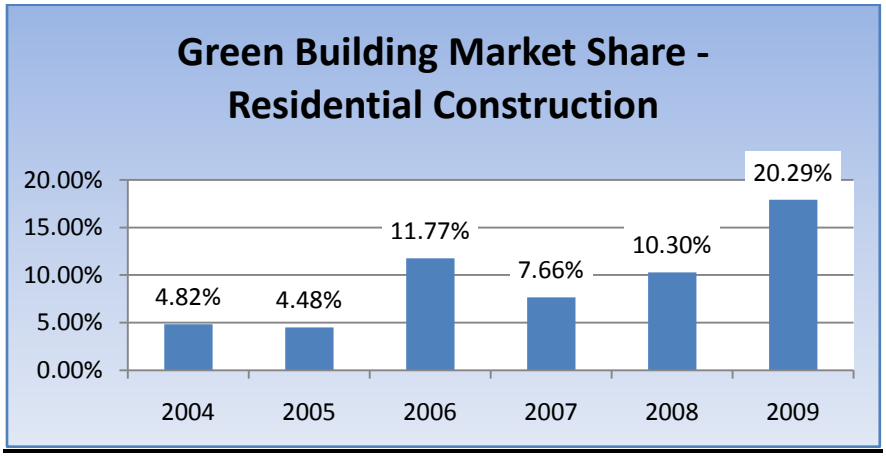
The city of Vancouver and Clark County convened a Sustainable Communities Stakeholders Group to evaluate their building, land use and development codes to identify and remove barriers to building sustainable, affordable residential developments (SARD). Funded through a grant from the Department of Ecology and facilitated by the Cascadia Region Green Building Council, the Group's recommendations resulted in Clark County Commissioners approving an ordinance establishing a pilot program for residential, commercial and mixed-use projects pursuing the Living Building Challenge, one of the world's most rigorous green building performance standards http://ilbi.org/.

This Sustainable Communities Ordinance allows some projects to bypass more traditional local codes and regulations to pursue use of advanced green-building strategies. Clark County is now accepting projects to the Sustainable Communities Ordinance pilot program (http://www.co.clark.wa.us/environment/sustainability/communities.html).

Work Metrics

Despite an overall decline in the real estate market nationwide, Washington has seen continued growth in its green building industry. And despite a decline in overall housing starts, market share of third-party certified green homes almost doubled.

Figure 2.1
Percent Residential Market Share of Certified Green Homes in WA



Unfortunately, the economic downturn has dramatically affected staffing and levels of activity in the building and building services professions. To manage these effects, the Green Building Group will report the measured progress specific to our milestones at the two and five-year points. In these and other years, we will continue to summarize our activities toward achievements of these milestones, as well as update the general data charts presented above.

Partnering for the Environment by Reducing Small-Volume Hazardous Materials and Wastes (Moderate Risk Waste)

Chemicals permeate every aspect of our lives. Some chemicals, such as those found in medicines, greatly enhance the quality of our lives. Others can have negative impacts on our health and the environment.

Because of their pervasiveness and potential harm, reducing small-volume hazardous materials and wastes is a primary initiative in the *Beyond Waste* plan. The goal of the initiative is to eliminate risks associated with products containing hazardous substances commonly used in

households and in relatively small quantities by businesses, along with any associated hazardous wastes. The state classifies this type of hazardous waste as moderate risk waste (MRW). More information is in Chapter 5 of this report.

Historically, MRW programs have focused on developing infrastructure to collect and dispose of household hazardous waste and conditionally exempt small quantity generator waste (CESQG), with the goal of protecting human health and the environment. However, due to a lack of data, we do not know what portion of the MRW waste stream these programs collect. We do know that collecting, processing and providing disposition for MRW is expensive. It would be better to prevent creation of these wastes in the first place.

There are multiple approaches to reducing MRW. We have become increasingly aware of the risk to human health and the environment when people *use* products containing toxic substances, not just when they dispose of them. So some approaches work to eliminate use of toxic substances in products, making products "greener." Hand-in-hand with this is promoting the use of "greener" products or safer alternatives. Specific Ecology projects that use these approaches include work on the Children's Safe Products Act, environmentally preferable purchasing, and bans on lead wheel weights and copper brake pads.

Another approach known as product stewardship aims to encourage manufacturers and retailers to take responsibility to reduce the lifecycle impacts of products, from product design to end-of-life management. Not only does product stewardship shift the burden of end-of-life management from local governments to manufacturers and retailers, it increases recycling of products, thereby reducing waste. Ultimately product stewardship can lead to product redesign, eliminating the use of toxic substances or making a product more recyclable.

Ecology is involved in several product stewardship initiatives, most notably E-Cycle Washington for electronics. With the passage of *RCW 70.275 Mercury Containing Lights – Proper Disposal* in the 2010 legislative session, Ecology is now on track to create a product stewardship program for mercury containing lights.

With paint product stewardship programs in Oregon and soon in California, Ecology anticipates it won't be long before there is pressure to create a paint program in Washington. Ecology is tracking other product stewardship initiatives including pharmaceuticals, carpet and packaging.

Reducing risks from MRW goes beyond safe handling and disposal. It is regulating hazardous substances according to hazard, toxicity and risk. It is also optimizing reuse and recycling. Ultimately, it is eliminating use of toxics in products and increasing use of safer products and services.

The following pages will discuss some of this work in more detail to explain how we hope to limit the amount of toxic substances put into the environment.

Partnering for the Environment by Reducing Toxic Threats

Reducing threats caused by historical and ongoing releases of toxic chemicals is the rationale behind many of Ecology's successful regulatory programs. But we are finding that cleaning up or managing these releases is not enough. These approaches are expensive and usually leave some contamination behind. New research is increasingly finding that very low levels of some types of toxic chemicals can cause serious harm.

Reducing toxic threats by preventing releases in the first place is the smartest, cheapest and healthiest approach. Increasing Ecology's investment in prevention strategies is the focus of Ecology's Reducing Toxic Threats priority initiative and a fundamental principle of the *Beyond Waste* Plan.

This initiative, building on work already done at Ecology, is aimed at fostering development of prevention approaches to avert exposures to toxic chemicals and avoid future costs that come when toxic chemicals find their way into the environment. We have identified two focus areas: preventing use of toxic chemicals in consumer products and preventing toxics from entering Puget Sound.

With resources at a premium, it will be increasingly important to keep expenses low and build on positive results achieved by others. Ecology is working with several other states to develop ways to share data, influence federal policy reform and establish a more standardized approach to identifying safer alternatives for toxic chemicals still in use.

Prevention strategies are not without their challenges, including:

- *Insufficient data.* Information on the presence of toxic chemicals in products is often not available. Without this data it is difficult to evaluate risk.

- *Understanding how to consider lifecycle impacts*. Back-end consequences such as cleanup or disposal costs are usually not factored into front-end design decisions. As a result, costs for cleanup and disposal are often disproportionately born by the taxpayer.

- *Lack of incentives and assistance to reduce toxics use*. Using fewer toxic chemicals in products is the surest way to avoid exposures and costly cleanups, but there are not enough incentives and assistance to do so.

- *Inadequate protections at the federal level*. States need to act because of the absence of an effective national system to provide consistent protections from toxic chemicals.

Ecology developed a work plan to address these challenges and focus our limited resources. The work plan includes the following elements:

- Implement the Children's Safe Products Act (CSPA), including developing the list of chemicals of high concern for children.

- Work collaboratively with other states to develop consistent approaches. Avoid duplication and leverage resources.

- Continue to focus on persistent, bioaccumulative and toxic chemicals (PBTs) and implementing the PBT rule.

- Continue to develop and implement strategies to reduce diesel emissions and wood smoke.

- Develop a toxics reduction strategy to protect Puget Sound.

- Develop a multi-program strategy to prevent toxics in storm water.

Significant Accomplishments in the Last 12 Months to Reduce Toxic Threats

Children's Safe Products Act

The Children's Safe Products Act (CSPA) requires Ecology to develop a list of chemicals of high concern for children. Manufacturers of children's products that contain any of these chemicals will have to report on them to Ecology.

Ecology staff in W2R and other programs completed work to identify and prioritize 59 chemicals that manufacturers of children's products must report on. Staff conducted a pilot rule process with interested stakeholders to develop reporting requirements that are feasible for business and provide Ecology with significant new data on the presence of toxic chemicals in children's products. Ecology will use this data to develop programs and strategies to protect children.

The reporting rule was filed for public comment in October 2010 and is expected to take effect in April 2011. Despite the moratorium on rule-making recently announced by Governor Gregoire, Ecology identified the Children's Safe Product rule as one necessary to proceed under the criteria set out by the Governor's Office.

Toxics Loading Study

Sample collection for Ecology's Toxics Loading Study, which will form the basis for the Puget Sound toxics reduction strategy, was completed in 2010. The study addresses 17 indicator toxic chemicals in 9 different pathways for 4 different land uses. In addition, we are now identifying major sources for these chemicals.

Chemical Action Plans for PBTs

The process of developing a Chemical Action Plan (CAP) for polycyclic aromatic hydrocarbons (PAH) began in 2010. W2R staff provided support to identify sources of PAHs entering Puget Sound. Work is now underway to create statewide estimates of PAH sources and draft recommendations for reducing releases of PAHs.

Work also continues to implement the lead, PBDE, and mercury CAPs. Staff notified the regulated community about the January 1, 2011, effective date of two laws regulating PBTs in products: the law banning lead wheel weights (RCW 70.270), and the law regulating deca-BDE in televisions, computers and residential upholstered furniture (RCW 70.76).

Ecology continued its effort to implement priority recommendations from the Lead CAP. We continue to work on reducing exposure to old lead-based paint, which is the most frequent cause of childhood lead poisoning.

In future years, we expect to develop a chemical action plan to address perfluorooctane sulfonates (PFOS).

Safer Alternatives & Green Chemistry

Preventing problems caused by toxic chemicals and reducing their use depends on transitioning to less harmful alternatives. Ecology staff worked with other states, businesses and non-governmental organizations in 2010 to develop protocols to identify safer alternatives to toxic chemicals to ensure when toxic chemicals are phased out, they are replaced with better substitutes.

Ecology is exploring ways to encourage green chemistry activity in our state both in industry and education. Looking to the future, we want to collaborate with business, schools, colleges and universities to grow the next generation of green chemists who will continue developing safer, healthier products and production methods. In 2010, Ecology hosted a green chemistry workshop for K-12 educators.

TSCA Reform

Washington and a group of 12 other states have worked together to influence more protective federal policy reform. In December 2009, this group of states published a set of *States' Principles on Reform of the Toxic Substances Control Act.* Ecology provided input to committee staff in the House of Representatives on draft safer chemical bills. In addition, Ecology staff supported the Environmental Council of the States in passing a resolution supporting TSCA reform.

Partnering for the Environment through Washington's Electronic Product Recycling Law

In January 2007, Ecology began implementing *Chapter 70.95N RCW, Electronic Product Recycling*, by registering manufacturers of desktop computers, portable computers, computer monitors and televisions into the Electronic Product Recycling Program (now known as the E-Cycle Washington Program). As of January 1, 2007, to legally sell these products in or into the state of Washington, manufacturers were required to:

- ✓ Register annually with Ecology and pay a program administration fee.
- ✓ Label their products with their brand.
- ✓ Participate in a plan to provide services for collection, transportation, processing and recycling these electronic products at the end of their useful life.

Manufacturers are automatically members of the Washington Materials Management and Financing Authority (WMMFA). As of January 1, 2009, they were required to participate in the Standard Plan for recycling electronic products. Starting in 2010, if a manufacturer or a group of manufacturers meet certain requirements they can opt out of the Standard Plan and form an independent recycling plan with approval by Ecology. The Standard Plan is managed by the WMMFA Board of Directors, comprised of 11 large and small computer and television manufacturers. The Board of Directors will prepare, submit and implement the Standard Plan for recycling electronic products covered by the law.

Through the first two years of program operations (2009-10), all manufacturers participated in the default recycling plan called the Standard Plan administered by the Washington Materials Management & Financing Authority. Independent manufacturer plans were proposed in each of the last two years, but Ecology could not approve them due to insufficient collection networks.

Since January 1, 2009, households, charities, school districts, small businesses and small governments have been able to drop off electronic products covered by this law for recycling at no charge.

E-Cycle Washington Program Accomplishments

Highlights

- In 2009, the first year of operation, the program recycled *38.5 million pounds* of TVs, monitors and computers.

- In 2010 the E-Cycle Washington Program has seen the following breakdown of materials go to recycling rather than landfilling or storage:

TVs	24.3 million lbs.
Monitors	10.8 million lbs.
Computers	3.5 million lbs.
Total	38.6 million lbs. (Estimated November 2010)

- Washington is a national leader in recycling electronics with a 5.8 lbs/capita average.

- Approximately 245 collection sites are established across the state. Drop-off sites and services are available in every county and every city with a population of 10,000 or more.

- Eight processors (recyclers) of electronic products have undergone the required compliance audit to prove they will meet the performance standards and have registered to provide recycling services for the E-Cycle Washington Program.

- The E-Cycle Washington Program is not just about recycling. Charitable organizations acting as collection sites have indicated that tens of thousands of working units received through the E-Cycle Washington Program have been sold for reuse.

Comprehensive Rules

Comprehensive rules, *Chapter 173-900 WAC, Electronic Product Recycling Program*, were adopted, delineating requirements of this program for manufacturers, collectors, transporters and processors of electronic products covered by the law (see http://www.ecy.wa.gov/pubs/0707042.pdf).

E-Cycle Washington Website

The website developed for the Electronic Product Recycling Program continues to provide up-to-date and detailed information for all affected parties on registration requirements, fees, public involvement opportunities and more (see http://www.ecyclewashington.org).

Public Information and Education Campaign

A public information and education campaign was launched. A program name, logo and easily identifiable web address were developed through a stakeholder workgroup. A toolkit full of information was also developed and distributed to local governments to help them promote the E-Cycle Washington Program. A similar toolkit and public outreach materials were made available for electronics retailers. Public education materials prepared by Ecology and WMMFA are being distributed.

Outreach and communication to the media was initiated, and will continue leveraging public interest in the program and generating some free publicity. Ecology is also working with retailers of electronics encouraging them to provide consumers with information about the E-Cycle Washington Program when new electronics are purchased.

Stakeholder Concerns

Ecology is not aware of any stakeholder concerns at this time.

Partnering for the Environment through Environmentally Preferable Purchasing (EPP)

Environmentally preferable products and services are those that have a less or reduced harmful effect on human health and the environment when compared to competing products or services that serve the same purpose. Each year, state and local governments in Washington have the opportunity to leverage over $4 billion in purchasing power to buy products and services that:

- ✓ Reduce greenhouse gases.
- ✓ Conserve energy and water.
- ✓ Reduce the amount of toxics used and disposed.
- ✓ Decrease waste and unsustainable packaging materials.
- ✓ Maximize the use of recycled-content materials.
- ✓ Support markets for green products and green jobs.
- ✓ Reduce maintenance and disposal costs, increase product life, and result in fewer health and safety claims.

The state's *Beyond Waste Plan* encourages state government to increase purchases of environmentally preferable goods and services. Ecology's EPP team, including staff from the W2R and Hazardous Waste and Toxics Reduction (HWTR) programs, helps state and local agencies meet *Beyond Waste* EPP goals. By promoting safer products and services, EPP also supports Ecology's key initiatives on reducing toxic threats, protecting Washington waters, and facing climate change.

Laws and Directives

EPP Legislation

Current state purchasing law does not require state agencies to consider the environmental impacts of goods and services in purchasing decisions. Ecology and General Administration (GA) have drafted joint legislation to change current state purchasing law to require consideration of the environmental impacts of products and services.

The legislation proposed for the 2011 session would require state agencies to buy green products and services that are comparable in quality, availability and cost to conventional products and services. The legislation would also influence local government and school district purchasing, since they often use the state contracting system for their own purchases.

The proposed legislation was prompted by the Governor's Climate Action Team recommendation that an intergovernmental workgroup examine barriers to EPP and consider legislation to address them. The agencies conducted an extensive stakeholder process involving state and local governments, business and environmental groups.

Ecology and GA will work together to make it easier for agencies to "buy green" by identifying safer, more energy-efficient products. If this legislation passes, it will stimulate the green economy by encouraging Washington companies to make greener products for state contracts.

Paper Conservation Program

In 2009, the Washington State Legislature passed into state law *Chapter 70.95.725, Paper conservation program* and *Chapter 43.19A.022, Recycled content paper for printers and copiers – Purchasing Priority*. The legislation requires state agencies to:

- ✓ Purchase 100-percent recycled content white cut sheet bond paper for use in printers and copiers.
- ✓ Develop and implement a paper conservation program to reduce use of printing and copy paper by 30 percent of current use.
- ✓ Develop and implement a paper recycling program with the goal of recycling 100 percent of all copy and printing paper in all buildings with 25 employees or more.

The legislation has been in effect since July 2010.

Outreach to State Agencies and Local Governments

State agencies buy goods and services from GA-administered state contracts, agency contracts and cooperative purchasing programs. Ecology provides training and technical assistance to purchasing, facilities and sustainability staff at other government agencies to help them identify and purchase EPP products. In 2010, the EPP Team responded to more than 100 technical assistance requests from state agencies, local governments, businesses and other entities.

During 2010, Ecology expanded and updated the environmentally preferable purchasing section of the *Beyond Waste* website (http://www.ecy.wa.gov/beyondwaste/epp.html). The website includes:

- ✓ Concise product fact sheets on how to purchase electronic products, cleaning products, vehicles and automotive products, and building materials and landscape management.
- ✓ How to use standards and certification programs to add EPP language to contracts.
- ✓ EPP related laws and directives.
- ✓ EPP and green meeting resource guides.

In 2010, Ecology established a Green Purchasing listserv to provide another easy form of communication with interested stakeholders. To join, visit the EPP website above.

Promoting Strong Product Standards and Certification Programs

Standards and certification programs are important tools to encourage design of products and services with positive environmental attributes. Standards establish specific human health, environmental and social criteria by which products can be measured and compared. Certifications or "eco-labels" are awarded to products that meet the standard. This makes it much easier for purchasers to "green" their contracts, as the standard can be incorporated in bid documents in just a few sentences.

Ecology promotes reliable standards and certification organizations that:

- Address product lifecycle stages from raw materials to end-of-life to the extent possible.
- Are independent of ties to product manufacturers.
- Require onsite testing and verification by an independent laboratory or certifying organization.
- Use a broad-based stakeholder consensus process (typically involving manufacturers, users, government, environmental advocates and academia) or other rigorous process to develop standards.

- Provide information on their organizational structure, funding and standards development process.

- Periodically review standards to stay current with new technology and emerging information about human health, environmental and social impacts.

By leveraging a significant portion of the state's buying power, independent third-party standards encourage design of products and services with positive environmental and human health attributes.

EPP at Ecology

Ecology has been a leader in implementing EPP in its own operations for much of its 40-year history. In 2009, Ecology updated its internal policy on Environmentally Preferable Purchasing Policy 13-04 to align with messages promoted in the draft joint agency legislation discussed above. Ecology's actions will also help address the Governor's mandate that Ecology lead the way in moving state government to carbon neutrality.

In 2010, Ecology offered training on green office products and the new EPP policy to agency purchasing coordinators and other purchasing staff. The focus of the training was as much on promoting reuse of office supplies as explaining how to do green purchasing.

Partnering for the Environment through Recycling and Beneficial Use of Organic Materials

With an overarching goal to turn organic wastes into resources, *Beyond Waste's* Organics Initiative promotes a closed-loop organics management system where markets for organic-based products are robust, and business thrive by creating new products from wasted organic materials. Through partnerships with other agencies and organizations, the vision for a closed-loop organics management system is becoming clearer.

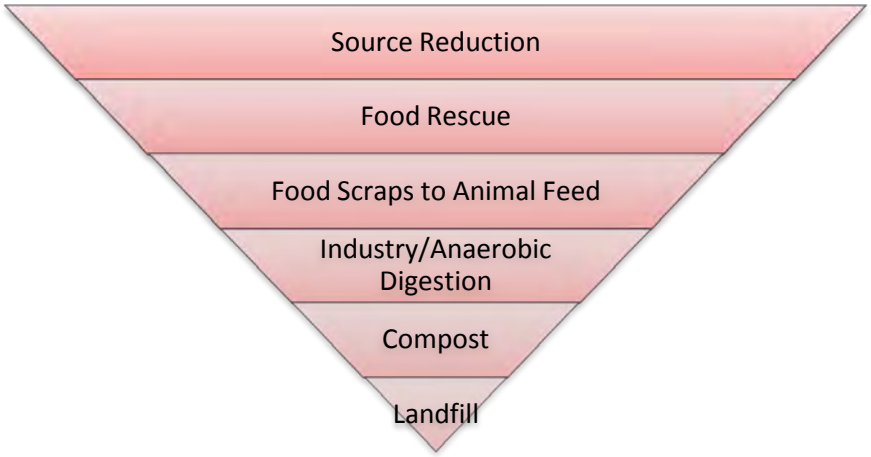
Partnering with Local Governments and Washington Universities to Focus on Organic Waste Reduction and New Processing Technologies

The Organics Initiative milestones reflect an increased emphasis on ensuring adequate infrastructure accompanying the push for increased organic material collection. And while we will continue to support the viable, traditional collection and composting programs, we are also focusing on new organic waste prevention programs and processing technologies.

Focus on Food Waste

In Washington, we compost a very small portion of the food waste generated. And, as indicated by the 2009 Washington Statewide Waste Characterization Study, food waste represents almost 18 percent of all material disposed of in landfills. The disconnect between processing technology and volumes of food waste generated is apparent.

The focus on food waste includes embracing the Environmental Protection Agency's food waste management hierarchy:



Source reduction, meaning creating less waste that must be rescued, recycled or disposed of, is a priority. Hoping to curb wasteful habits, we are working regionally to identify successful programs that change the way we consume food.

New Organics Processing Technologies

Ecology supports development of new organics processing technologies through Organic Waste to Fuels grants to Washington research universities (see next discussion). Washington State University is currently developing high solids anaerobic digestion (HSAD) and pyrolysis technologies.

HSAD research may deliver a process that economically treats yard and food waste to recover both methane for fuel or energy, and a soil amendment. Similarly, the pyrolysis process may result in multiple end products, such as biofuels and soil amendments that sequester carbon.

Waste to Fuels Technology

Waste to Fuels Technology projects have focused on balanced approaches for recovering fuels from organic solid wastes. Ecology continues to support developing science and engineering for a municipal organics food and green waste HSAD. And we have begun another project this biennium to produce transportation fuels, green gasoline and bioethanol, while producing extremely stable carbon "biochar" for improving soil productivity through Pyrolysis.

High Solids Anaerobic Digester (HSAD) Project

Capital costs associated with anaerobic digestion are high for constructing large tanks, and ancillary pumps and piping. In addition, day-to-day expenses can be high for operations and maintenance. To address these cost issues, two approaches on HSAD are being evaluated for applicability and scale-up to pilot a commercial scale design:

- An upper high solids (25-40% solids***)*** *leach bed* reactor.

- A moderate high solids (10-15% solids) *pumpable solids* reactor.

Anaerobic digestion is biologically self limiting by acidity and ammonia production. Both approaches being tested are robust for acid and ammonia control, applying methods that have been tested and demonstrated at the bench scale. Testing now underway will determine how well these methods can be optimized to be built at commercial scale.

The leach bed reactor and pumpable solids reactor systems feature modules for control of acids produced in the biological reduction of feedstocks, methane production and nutrient recovery, stabilizing system acidity and reuse of water. Each approach is being tested at floor scale within or adjacent to the "Hot Room" Laboratory operated by the Washington State University Biological Systems Engineering Department.

The floor scale laboratory equipment for the leach bed reactor design is shown in the photo below. Through our Waste to Fuels Technology research support, WSU has previously shown high methane gas production in the high solid digester project. The floor scale leach bed reactor will test further minimization of tank size with very high solids feeding rate, while still maintaining overall biogas production, nutrient recovery, acidity control and water recycle and reuse.

High Solids Anaerobic Digester floor scale laboratory digester under testing at WSU Biological Systems Engineering Department.

The floor scale laboratory equipment for the pumpable solids reactor design is shown in the next photo. The floor scale pumpable solids reactor will test moderate minimization of tank size with increased solids feed two to three times that of typical four to five percent solids digesters. This could yield more economic tank sizes while still being able to move solids through the process with pumps. Like the leach bed reactor, the objective is to maintain high overall biogas production, nutrient recovery, acidity control and water recycle and reuse.

Moderate High Solids Anaerobic Digester floor scale laboratory digester under testing at WSU Biological Systems Engineering Department.

Pyrolytic Production of Fuels and Biochar

In addition to the dual approach assessment of HSAD, WSU is working on an optimized design for recovering fuels, energy and stable organic carbon for soils from woody waste that may include land clearing, tree and limb trimmings straw and other lignocellulosic waste. The first phase of the project was to conduct a literature review and assessment of historic and current reactor design for producing bio-char with heat recovery (through slow pyrolysis) and for producing bio-char and bio-oil (through fast pyrolysis).

This report will assess the strengths and weaknesses of existing designs for pyrolysis reactors and auxiliary equipment, and technologies to produce high value products and biofuels from bio-oil and bio-char. The report will also evaluate the potential of these technologies for Washington State.

The second phase of the review was to develop design objectives for a new reactor that can be used with a broad range of feedstocks and operating conditions for the production of fuels, energy and stable carbon "biochar." A final report will be prepared by the end of the biennium.

Organic Waste to Resources

With staff from other agencies on the State Bioenergy Team and Northwest Environmental Business Council and supported directly with funds to Washington State University Extension Energy Office, W2R staff assisted in planning and completing a Bioenergy Symposium and Washington Future Energy Conference. The conference was held in Seattle at the Washington Trade and Convention Center November 8-10, 2010.

Washington Department of Commerce led this conference with support from Ecology's W2R Program, the departments of Agriculture and Natural Resources, WSU, University of Washington and Battelle Pacific Northwest Laboratories.

WSU Extension Energy staff led the planning for the Bioenergy Research Symposium. W2R staff spoke and moderated sessions during the symposium and conference. About 150 people attended the symposium and about 450 attended the future energy conference. Planning staff are assessing feedback to determine whether this should become an annual future energy conference for Washington and the Pacific Northwest region.

Partnering with State Governments to Build Strong Markets for Recycled Organic Materials

Increasing Access to Compost Markets

Composting effectively turns wasted organic materials into a valuable product. However, if markets are weak, the finished product may become a burden rather than a boon to compost facilities. Working with state government, we are suggesting changes to compost specifications and purchasing policies. The changes will increase compost purchases made by government agencies.

Building Support for Healthy Soils

Maintaining and building healthy soils creates opportunities for sequestering carbon, protecting Washington waters and increasing food security. Several fact sheets are available that provide information and links to increase awareness of the benefits of healthy soil. Click on Building Healthy Soil or go to http://www.ecy.wa.gov/biblio/0907035.html for more information.

Partnering with Statewide Organic Management Group to Support Sustainable Compost Facility and Program Development

Creating Sustainable Systems to Manage Organic Materials

The diverse Statewide Organic Management (SOM) Group was originally brought together to address odor issues. Members included local and state governments, air authorities, compost facility owners and operators, materials haulers and consultants. SOM partners quickly

identified odor issues at compost facilities as a symptom of a larger problem: *"We undervalue the role that facilities, the usefulness of the end product and organics management in general play in overall materials management systems."*

Following the problem statement, SOM developed a vision, scope and objectives. Communication and education rose to the top as the overarching theme for the group. To help strengthen compost markets, recommendations were made to strengthen purchasing language requiring local and state agencies to purchase and use compost from compliant facilities.

Partnering with the Washington Organic Recycling Council (WORC) to Promote Beyond Waste Goals

Improving Compliance and Product Quality at Compost Facilities

WORC is a nonprofit association dedicated to support and promote all aspects of organic recycling. WORC members include compost facility owners and operators, local and state government representatives, and others with an interest in all things organic.

Each year, WORC hosts Compost Facility Operator Training (CFOT). Students from around the state (and world) gather for one week of lecture and hands-on training at the Washington State University (WSU) Puyallup Research Station. Instructors include Ecology and WSU staff, compost engineers/consultants, and compost facility operators.

2010 marked the 16th year of CFOT. This training program provides an invaluable opportunity for students and instructors to learn and share ideas on proper operation and regulation of compost facilities in Washington. Over 430 students have taken the training since its inception.

The 2010 training was held on October 18-22 at WSU/Puyallup with 33 students, 8 instructors and 10 guest presenters/panelists. Since this is the only training of its kind in the state and surrounding area, it attracted out-of-state students including California and Oregon, and also Canada.

Students learn current compost science: How to blend incoming feedstocks to create the correct moisture levels, carbon to nitrogen ratios and porosity; and how to manage compost piles to maintain aerobic conditions and produce a high-quality finished product. As a result of the training, operators and regulators learn about compost operation challenges, increasing compliance and product quality at compost facilities.

The training included lectures, fieldwork and field trips. Presentations were made by compost facility operators, a compost consultant, WSU scientists, a lab testing specialist and Ecology representatives. In addition to classroom time learning about odor control, facility design and soil biology, students received hands-on experience building their own compost piles, sampling compost, touring compost facilities/Low Impact Development (LID) sites and evaluating pre-built piles.

Students learned safe, effective ways to make compost from a multitude of feedstocks. Fieldtrip tours included Lenz Enterprises (Stanwood), Cedar Grove Everett, and Bailey's Compost (Snohomish). Students observed two low-impact development sites in which compost was used (WSU/Puyallup, and Mont Lake Terrace).

Instructor Andy Bary (WSU/Puyallup) discussing the different properties of feedstocks used for composting.

Jeff Gage (Lenz Ent., Compost Design Services) giving a tour of Lenz Enterprises.

Commercial Sector Role in Reaching a Closed-Loop Organics Recycling System

Ecology views commercial composting as a key element in the closed-loop organics recycling system. To build consumer confidence, compost facilities that process organics like yard debris and food scraps must use well-trained staff to produce a consistent, high-quality product. At the same time, commercial composters must operate their facilities to ensure they protect human health and the environment.

Composting facilities are regulated under C*hapter 173-350 WAC, Solid Waste Handling Standards*. The composting standards include design and operating requirements for permitted facilities. In addition, testing criteria must be met for the final product to be considered "composted material." *WAC 173-350-220, Composting Facility Standards,* also offers several categories of composting activities that are exempt from solid waste permit requirements. The exemption categories were designed to "promote composting while protecting human health and the environment."

In 2009, 44 (up from 41 in 2008) compost facilities were operating with a solid waste handling permit or conditional exemption for permitting. Table 2.1 indicates an increase in organic material collected for composting, energy recovery and recycling. The total material processed for composting, resulted in 1,163,539 cubic yards of finished product (up from 1,153,172 cubic yards in 2008).

Table 2.1
Organics Recovery Comparison

	2008	2009
Recycled/Composted		
Yard Waste	641,130	626,729
Wood Waste	381,866	200,980
Food Waste	48,664	77,699
Total Recycled Materials	**1,071,660**	**905,408**
Diverted		
Agricultural Organics	31,800	45,431
Food Processing Wastes	3,494	14,027
Industrial Organics	45,586	85,692
Land Clearing Debris	169,428	162,989
Other Organics	86,191	47,430
Wood for Energy Recovery	331,528	613,888
Yard Waste for Energy Recovery	167,435	79,061
Total Diverted Materials	**835,462**	**1,048,518**
Total Recovery (Organics + Diverted)	**1,907,122**	**1,953,926**

Food scraps were composted at 17 compost facilities throughout the state (an increase from 14 in 2008). Food scrap categories include pre-consumer vegetative, food processing waste, yard debris/food scraps and post-consumer food scraps. Of these facilities, ten accepted pre-consumer vegetative food scraps, four accepted food processing waste, two accepted post-consumer food scraps, and five accepted other categories of food waste (includes yard/food scraps).

Ecology continues to work with Washington State University Cooperative Extension researchers, consultants and local governments to educate potential composters about new opportunities and their responsibility to use best practices when composting even small volumes of material. We also continue to partner with the Washington State Department of Transportation to promote compost use for erosion control and storm water management along roadways.

Partnering for the Environment through Anaerobic Digestion

State law provides an exemption from solid waste handling permitting for co-digesting dairy manure and organic waste under specific conditions (Chapter 70.95.330 RCW). Ecology published guidelines to help digester operators manage the additional organic materials (such as food waste) and the resulting digestate under conditions of the permit exemption (Ecology Publication 09-07-029). These digesters must obtain and comply with other applicable state and local permits. A digester that does not meet these conditions is required to obtain and comply with a solid waste handling permit from the jurisdictional health department.

Basics of Manure Management

A full-grown dairy cow generates 100 pounds of manure per day. That means the 200,000 full-grown dairy cows in Washington produce up to 20 million pounds of manure each day.

Historically, dairy cows wandered around family farm fields in pastoral bliss, spreading manure (or *nutrients* as some farmers like to say), effectively fertilizing the lands as they grazed. Today, dairies often confine cows in feedlots where manure is flushed into a lagoon for storage until it is used to fertilize crops. Open lagoon storage of manure causes serious odor issues from methane, hydrogen sulfide and ammonia releases.

Anaerobic digesters help address manure odors, capture greenhouse gases and recycle nutrients. Digesters also provide revenue streams for dairies in these difficult economic times. Digester use in Europe is well developed with more than 600 manure digesters in use. EPA estimates 126 of the 65,000 dairy farms in the U.S. use manure digesters (for more information see the EPA's AgSTAR website at http://www.epa.gov/agstar/projects/index.html).

Washington State is just starting to dip its toe in the world of anaerobic digestion of manure with four operating digesters. The Climate Action Team Study estimated that 135 of the 500 dairies in this state could manage manure in an anaerobic digester (dairies with more than 500 cows). Four manure digesters in Washington are concrete structures built to hold 21 days of manure at roughly 100°F. Dairy manure is piped or trucked to the digester where it is often mixed with other organic materials like dairy, chicken, seafood or fruit processing wastes. This manure mix is continuously fed into the digester. One of these operating digesters takes in over 60,000 gallons of manure each day.

In the digester, anaerobic bacteria convert the manure and organics into biogas, solids and liquids. The biogas consists mostly of methane (a greenhouse gas 20 times more potent than carbon dioxide) and carbon dioxide. Biogas pressure builds up in the concrete digester and a pipe delivers the biogas to a modified natural gas engine. Methane fuels the engine, which in turn spins an electric generator to create electricity.

Under normal dairy operations methane is released into the atmosphere during lagoon storage of manure. Processing manure in an anaerobic digester captures this methane and reduces greenhouse gas emissions from dairy operations.

Waste heat from the engine is used to keep the digester warm and can offset fuel purchases on the farm. Excess electricity is sold back to the local utility. After 21 days, the output from the digester is mechanically separated into solid and liquid digestate. Solid digestate can be used to replace sawdust or sand, which the dairy would normally purchase for cow bedding. Liquid digestate is returned to the dairy manure lagoons for storage and later used as fertilizer. The nutrients in the liquid digestate can be used in place of synthetic fertilizer.

Dairy Digesters in Washington


Qualco digestate liquid storage

Today, a handful of dairy farms in Washington use anaerobic digesters to put their cow manure to work generating renewable energy. In 2009, three manure digesters in Washington operated under the conditions of the solid waste handling permit exemption.

Table 2.2 summarizes the energy produced by co-digesting manure and organics in the three operating dairy digesters. The 7,536 megawatt-hours (MW-h) produced is enough to power 6,900 average homes in Washington. Table 2.3 lists the operating digesters and some planned dairy digesters. The W2R Program provided oversight of anaerobic digesters that co-mingle manure and other organics.

The Washington State Department of Agriculture (WSDA) continues to oversee dairies as required under the Dairy Nutrient Management Act. The W2R Program and WSDA collaborate on inspections, record reviews and annual reports. At the end of 2009, operators reported volumes of organics and manure digested. Table 2.2 lists the power produced and volumes of manure and organics digested by the three permit exempted digester operations in 2009.

Table 2.2
Dairy Digesters Total Manure and Organics Processed in 2009

Green Power Produced	Manure Digested	Co-digested Organics
7,536 MWh	44,161,895 gallons	9,497,119 gallons

Note: Three operations reported co-digestion totals in 2009: FPE Renewables, Qualco Energy, and Farm Power-Lynden.

Table 2.3
List of Active and Planned Digesters

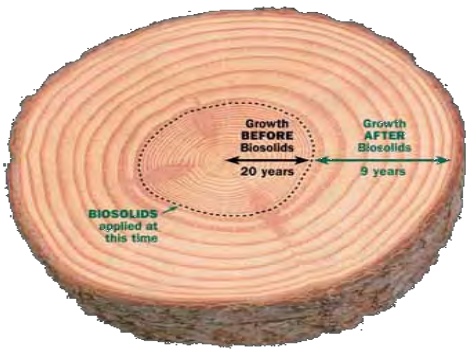
Digester Name	City, County	Partner Dairy	AD Started
FPE Renewables	Lynden, Whatcom	Vander Haak Dairy	2004
Qualco Energy	Monroe, Snohomish	Werkhoven Dairy	2008
Farm Power-Rexville	Rexville, Skagit	Harmony Dairy Beaver Marsh Farms	2009
DeRuyter	Outlook, Yakima	DeRuyter & Sons Dairy	2010*
Planned Digester	**City, County**	**Partner Dairy**	**Status in 2010**
Farm Power-Lynden	Lynden, Whatcom	MJD Farms	Startup Nov 2010
VanDyk Dairy	Lynden, Whatcom	VanDyk Holsteins	Under construction
Rainier Biogas	Enumclaw, King	Ritter Dairy Wallin Dairy DeGroot Brothers Dairy	Planning and permitting

* Digester combined off-farm organics with manure.

Partnering for the Environment through Biosolids Recycling and Beneficial Use

Managing biosolids by recycling/beneficial use is the main choice in Washington. Ecology's biosolids program supports the state's goal and statutory preference for beneficial use of biosolids. In accordance with *Chapter 70.95J RCW*, *Municipal Sewage Sludge – Biosolids,* municipal sewage sludge that meets the quality standards for beneficial use is considered "biosolids" and regulated as a commodity, not solid waste. Ecology strongly encourages all producers of biosolids to pursue beneficial use.

In 2009 approximately 95,000 dry tons of biosolids were managed. Of this amount approximately 83 percent was land applied and 17 percent incinerated, and less than 0.2 percent was landfilled. The following photos represent just some of the many uses of biosolids.



Use of biosolids in commercial forestry in Pierce County
(Douglas-fir growth before and after biosolids)

Use of biosolids in slope stabilization along U.S. Highway 97A in Chelan County (background, no biosolids; foreground, biosolids compost)

Use of biosolids in agriculture in Douglas County (left, control; middle, commercial fertilizer; right, biosolids)

Use of biosolids in horticulture in King County (left, control; right, biosolids compost)

Permit Program & Fees

Biosolids management is regulated through *Chapter 173-308 WAC, Biosolids Management* (the state biosolids rule), and the *General Permit for Biosolids Management* (biosolids general permit). Ecology staff, with assistance from local health jurisdictions (LHJs), oversees the state biosolids program.

The current state biosolids rule went into effect on June 24, 2007. The current biosolids general permit was effective August 20, 2010, and will remain in effect for five years.
The state biosolids rule and the biosolids general permit govern the quality of biosolids applied to the land and practices at land application sites.

Biosolids must meet standards for pollutant limits, pathogen reduction and vector attraction reduction appropriate to the intended end use. Biosolids used where future exposures are uncontrolled (e.g. lawns, home gardens, golf courses, top soils, etc.) must meet higher standards than biosolids applied to areas where access and crop harvest restrictions can be put in place. Biosolids must also meet standards for allowable recognizable manufactured inerts similar to that for composts under the state solid waste rule.

There are about 380 facilities required to be covered under the biosolids general permit. The majority of facilities are publicly owned wastewater treatment plants, including those at state and federal facilities. Other types of facilities required to seek coverage under the biosolids general permit are:

- Privately owned treatment facilities that treat only domestic wastes.
- Certain composting facilities that use biosolids as a feedstock.
- Biosolids beneficial use facilities (land appliers who obtain a permit to reduce the permitting requirements for their clients).
- Septage management facilities (persons who treat or land apply septic tank materials).

Coverage under the general permit is provided in two phases:

1. Provisional approval.
2. Final approval.

A facility obtains "Provisional" approval by submitting a *Notice of Intent* and a complete *Application for Coverage* as provided in the state biosolids rule and the biosolids general permit. Under provisional approval, a facility is authorized to carry out biosolids management activities according to the conditions of the biosolids general permit, conditions in any submitted plans, conditions in the state biosolids rule, and conditions in any other applicable state, local or federal regulations.

"Final" approval may be granted after a full Ecology review of the permit application and operating practices. In issuing final approval, Ecology often imposes "additional or more stringent" conditions necessary to ensure proper biosolids management and protection of human health and the environment. Any such conditions are subject to appeal.

All permittees are expected to submit complete permit applications in 2010. By streamlining the permitting process through changes to the state biosolids rule and the biosolids general permit and making greater efforts toward getting necessary information from all permittees, we expect the rate of final approvals provided during the current permit cycle to be much higher than during the previous permit cycles.

Ecology charges a fee to permittees to support the state biosolids program. Currently, the permit fee brings in about $850,000 and supports about 6.0 FTEs committed to implementing the biosolids program.

Delegation to Local Health Jurisdictions

Currently five LHJs have accepted some degree of delegation to carry out the state biosolids program. Each delegated LHJ has entered into a formal Memorandum of Agreement with Ecology. The delegated LHJs have actively taken the lead to conduct various aspects of the biosolids program within their jurisdictions. Most other LHJs provide some degree of assistance to Ecology. Funding and workload demands on staff continue to be the major reasons LHJs do not pursue delegation of the biosolids program.

Partnering for the Environment through Beyond Waste Performance Indicators (aka Measuring Progress Initiative)

Beyond Waste is the state plan for managing hazardous and solid waste. This 30-year plan has clear, simple vision: Eliminate wastes whenever we can and use the remaining wastes as resources. The goal of the fifth *Beyond Waste* Initiative, *Measuring Progress*, is to help Ecology and its partners make the transition to a long-term data tracking system that measures progress toward the overall vision as well as individual initiatives.

How are We Doing on Achieving the Vision?

Ecology's W2R and HWTR programs worked together to develop and update a series of indicators that track progress toward *Beyond Waste* goals. We made major strides toward developing effective, rational ways to measure Washington's success at reducing use of toxic substances, and generating both solid and hazardous wastes. Ecology is also addressing the broader themes of *Beyond Waste* by developing and maintaining measures that show how our progress toward these goals relates to economic, environmental and social vitality.

Ecology released the fourth update of the *Beyond Waste Progress Report* (http://www.ecy.wa.gov/beyondwaste/bwprog_front.html) in November 2010. The indicators track progress toward the *Beyond Waste* initiatives - industries, green building, organics recycling and small-volume hazardous wastes, as well as progress toward overall goals of reducing waste and toxics.

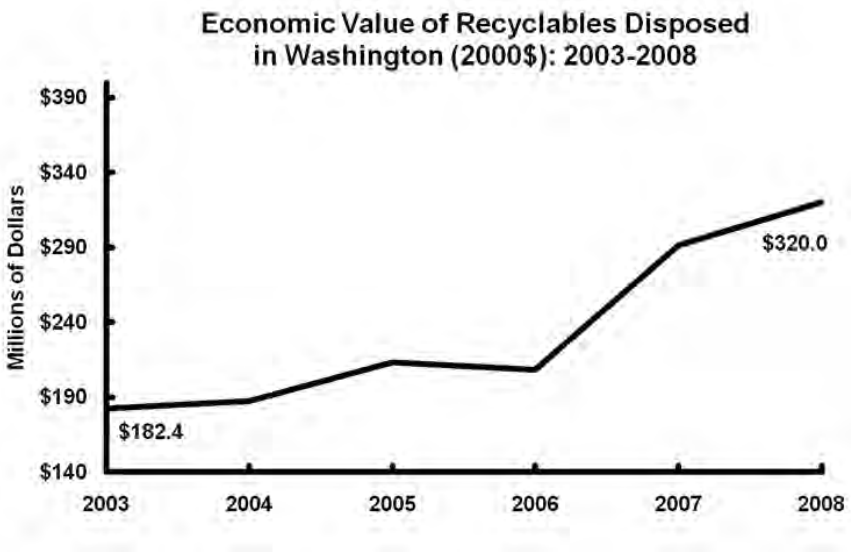
The recently updated *Progress Report* has 16 indicators and measures 3 major areas of focus:

1. Eliminating wastes and toxics, and using waste as resources.
2. Economic, environmental and social vitality.
3. Reducing risks.

We are beginning to see some trends related to implementation of *Beyond Waste* in some of the specific indicators. Baselines by which we can gauge our progress have been established, and the trends are available in the *Beyond Waste Progress Report*. Specific indicators include solid waste generation, hazardous waste generation, risk from toxic releases, solid waste recycling, hazardous waste recycling, electronics recycling, organics recycling and green building.

We are making significant progress in some key areas. We have recycled more solid waste (garbage), organics (compostables) and electronics (old computers, monitors and televisions) over the last few years. However, some trends are disappointing. Despite our recycling efforts, in 2008 we threw away $320 million in recyclables (Figure 2.2).

Figure 2.2



Good news includes hazardous waste generation is decreasing and green building versus conventional construction is increasing. In addition, many businesses are creating less hazardous waste per dollar earned. Progress in these areas shows how moving toward the *Beyond Waste* vision can help individual businesses, the economy and the environment.

The five-year update of the Beyond Waste Plan was completed in December 2009. With this update, the Measuring Progress Initiative was revised. The initiative has new recommendations and milestones in these areas:

- Analyzing and evaluating the indicators;
- Tying indicators to staff work plans;
- Completing waste characterization studies;
- Tying indicators to policy decisions;
- Expanding the communication strategy for the Progress Report; and
- Updating and enhancing the Consumer Environmental Index (CEI).

In 2010, Ecology began implementing the new recommendations for the Measuring Progress Initiative with an evaluation of the existing Progress Report. We will complete this year-long process soon and begin work on revising the existing report based on what we learned in the evaluation process.

To see the full Beyond Waste Progress Report, including detailed information about each indicator, see http://www.ecy.wa.gov/beyondwaste/bwprog_front.html.

Partnering for the Environment through Waste Tire Removals

An environment free of waste tires is important to the public health of all Washington citizens. Piles of waste tires harbor mosquitoes, snakes and other vermin. West Nile Virus, transmitted by mosquitoes, threatens health. Tire piles also present a dangerous fire hazard. Many tire piles exist for a significant length of time. Ecology has been working with public entities to clean up unauthorized dumpsites and prevent further waste accumulation.

Tire Cleanup Fund

In 2005, the Legislature passed SHB 2085, creating a Waste Tire Removal Account to fund cleanup of unauthorized and unlicensed tire piles. Funds for this account come from a $1 fee charged on each new replacement tire sold in Washington. The 2009 Legislature removed the sunset on this fee and allocated a biennial budget of $1 million to Ecology (Senate Bill 5796). The balance of this account transfers to the Washington State Department of Transportation's Motor Vehicle Account on September 1 of odd numbered years (starting in 2011). Ecology continues to use Waste Tire Removal Account funds for tire related efforts across the state.

Partnering with Public Entities for Waste Tire Pile Prevention

In May 2010, Ecology allocated funding not committed to cleanup contracts to local waste tire efforts. Waste tire pile prevention activities were the priority for these local efforts. Individual agreements are in place with the 16 public entities listed in Table 2.4. One project does not have a tire pile prevention or removal focus: Washington State University's proposal to do a literature review and feasibility study of tire shred use in civil engineering projects.

Requests for funding usually involved hosting local amnesty events for private citizens and providing education for proper waste tire management. Several counties are offering selected property owners vouchers for free tire drop-off and providing followup enforcement. One county will conduct enforcement visits at Ecology funded cleanup sites to confirm proper waste tire management.

Table 2.4
Locally Funded Tire Efforts for 2010

Organization	Cost	Prevention	Removal	Education
Colville Confederated Tribe	$ 78,625	X	X	X
Jefferson County Health	10,350	X	X	X
Benton County Mosquito Control	4,187	X	X	X
Lewis County Solid Waste	4,085	X	X	X
Kitsap County Solid Waste	42,566	X	X	X
Skagit County Public Health	10,000	X	X	X
Snohomish County Solid Waste	18,208	X	X	X
WSU Civil Engineering	18,800			X
Whitman County Solid Waste	9,300	X	X	X
King County Solid Waste	4,500	X	X	X
Grays Harbor County Health	13,225	X	X	X
Spokane Tribe	5,000	X	X	X
Moses Lake Irrigation District	1,500	X	X	X
Walla Walla City/County	11,020	X	X	X
Whatcom County Health	25,020	X	X	X
Mason County Health	5,000	X	X	X
Total Expected Cost	**$261,386**			

Completed Waste Tire Pile Cleanups

Between May 2007 and November 2010, Ecology contractors removed 175 tire pile sites in Washington State containing nearly 5.5 million waste tires. Information in the following tables and charts is provided in tons of tires (1 ton of tires equals about 100 passenger tires).

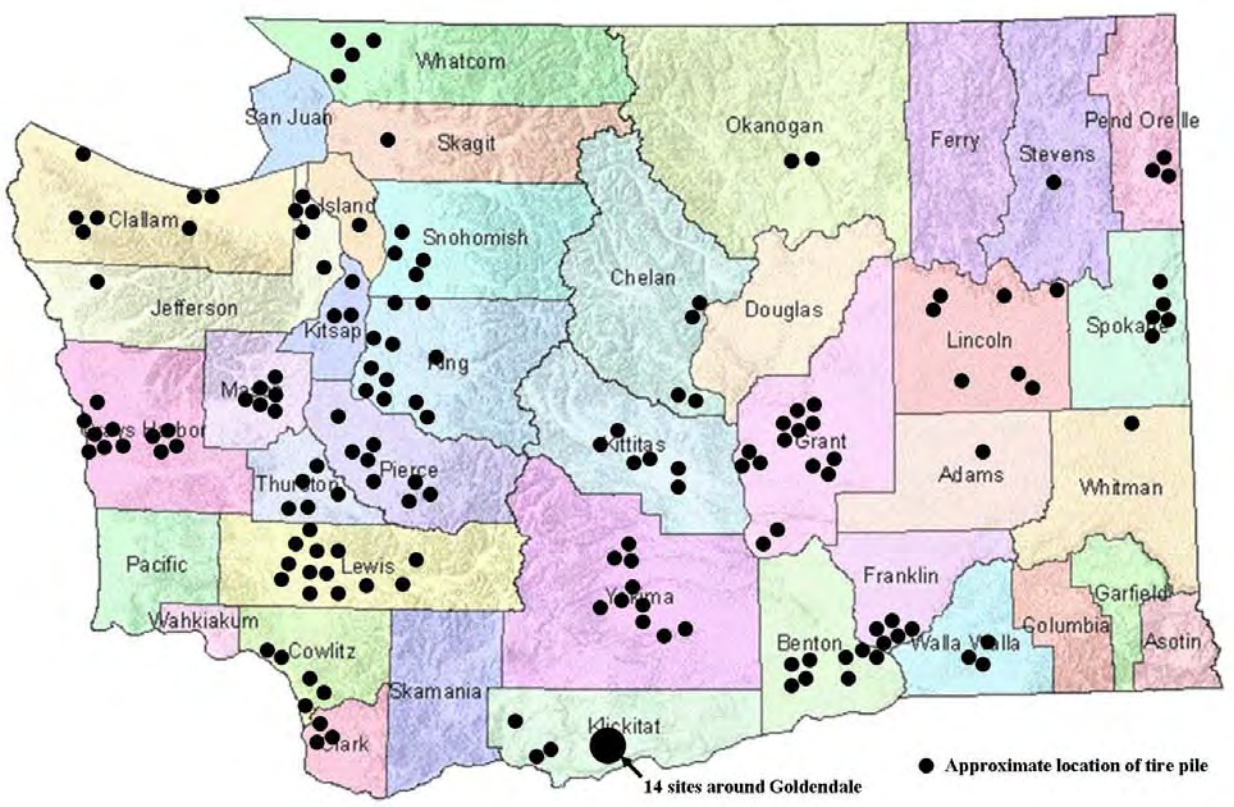
Common recycling and reuse of waste tire materials includes crumb rubber, stamped rubber bumpers, tire rings, fuel for cement kilns and scrap steel (wheel rims).

Table 2.5 provides a summary listed by county of the completed tire removals using the Waste Tire Removal Account funding. The cost of all removals, total tons removed, and amount of tires recycled are listed in the table. Map 2.1 shows the approximate locations of these tire cleanup efforts, including one dot for the 14 sites located in and around Goldendale (Klickitat County).

Table 2.5
Tire Pile Cleanup 2007-10

County	Sites	Tons	Cost	% Recycled
Adams	1	213	$ 51,659	100%
Benton	8	1,044	$ 227,252	84%
Chelan	4	814	$ 188,400	72%
Clallam	7	1,321	$ 368,883	78%
Clark	3	742	$ 144,209	94%
Cowlitz	5	331	$ 70,011	93%
Franklin	5	1,293	$ 326,819	91%
Grant	14	2,636	$ 707,921	78%
Grays Harbor	11	1,620	$ 289,573	92%
Island	1	43	$ 7,852	100%
Jefferson	7	1,046	$ 221,390	78%
King	11	2,233	$ 418,061	91%
Kitsap	2	249	$ 42,630	99%
Kittitas	6	965	$ 242,169	100%
Klickitat	17	21,489	$ 2,464,005	13%
Lewis	13	6,390	$ 1,036,278	39%
Lincoln	7	747	$ 236,396	92%
Mason	6	1,303	$ 237,354	97%
Okanogan	2	557	$ 157,635	99%
Pend Oreille	3	213	$ 26,693	98%
Pierce	8	823	$ 158,789	95%
Skagit	1	62	$ 13,154	91%
Snohomish	4	486	$ 127,258	92%
Spokane	5	1,399	$ 277,789	100%
Stevens	1	97	$ 23,367	100%
Thurston	5	1,225	$ 244,165	97%
Walla Walla	3	415	$ 105,445	88%
Whatcom	4	237	$ 61,784	73%
Whitman	1	278	$ 50,652	66%
Yakima	10	4,560	$ 921,052	20%
TOTAL	**175**	**54,832**	**$ 9,448,644**	**84%**

Map 2.1
Completed Tire Pile Cleanups in Washington 2007-10



Annual Averages for Tire Pile Cleanups

Table 2.6 provides a breakdown by year for cleanup activities listed in Table 2.4. The high cost per site experienced in 2007 is due to several very large cleanups conducted at the start of the program. The largest tire pile cleanup was at the Goldendale tire pile which contained more than two million tires. More than 200,000 tires were removed from each site at the Pumphouse Road, Petty and Napavine cleanups. Excluding those four large cleanup efforts, tire pile size across the state averaged 15,600 tires with a median size of 9,000 tires.

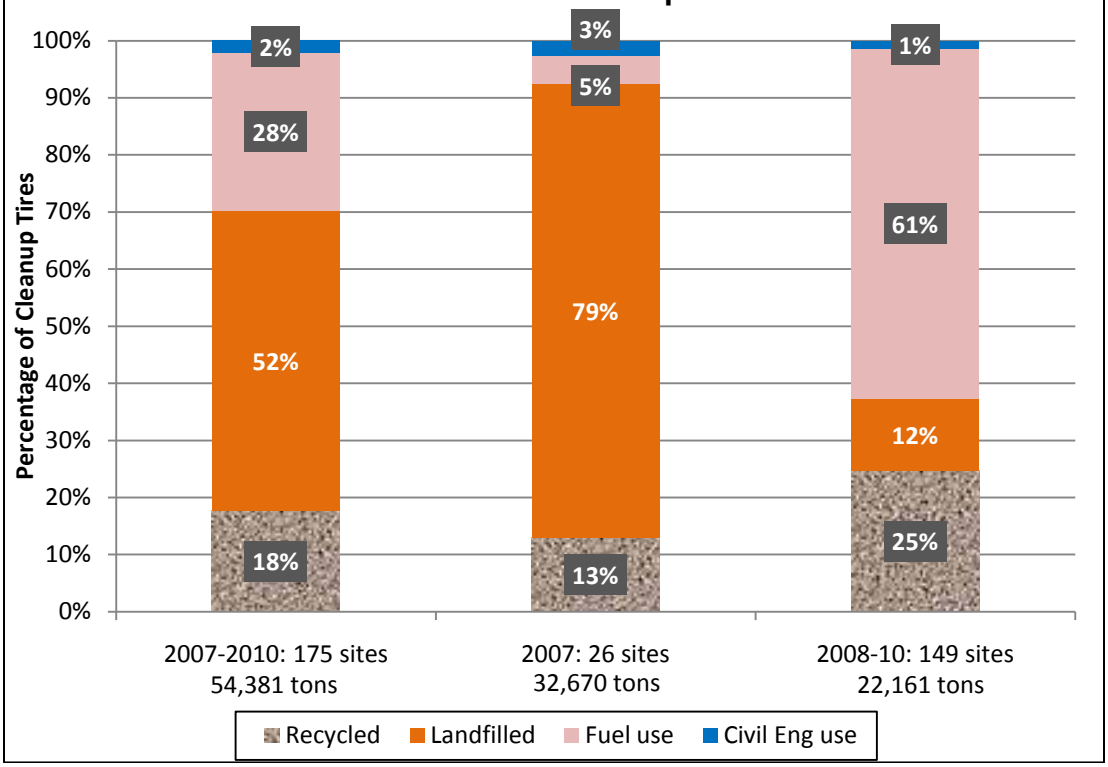
Table 2.6
Summary of Completed Tire Pile Cleanups by Calendar Year
(1 ton of tires = 100 passenger tires)

Year	Sites	Tons	Recycled or Reused	Total Cost	Average Cost/site	Average Cost/ton
2007	26	32,671	55%	$4,300,079	$165,388	$132
2008	53	8,324	86%	$1,933,954	$ 36,490	$232
2009	82	11,607	92%	$2,615,801	$ 31,900	$225
2010	14	2,230	80%	$ 598,810	$ 42,774	$269
Total	**175**	**54,832**	**> 80%**	**$9,448,664**	**$ 69,137**	**$214**

Recycling and Reuse of Tire Pile Cleanup Tires

Figure 2.3 shows recycling, reuse and landfilling of cleanup program tires all cleanups completed between 2007 and 2010. The first column in the graphic shows the ultimate use or disposal of all tires collected during the four-year cleanup efforts. A higher proportion of tires were landfilled during the 2007 cleanups (79 percent), shown in the second column. The third column represents the last 3 years of cleanup work, 2008-10, and shows the lower percentage of landfilled tires (12 percent).

Figure 2.3
Final Use of Cleanup Tires



Partnering for the Environment through Financial Assistance

Grants to Local Governments - Coordinated Prevention Grants

Coordinated Prevention Grants (CPG) were historically funded by the Local Toxics Control Account (LTCA).[2] However, the 2009-11 funding comes from the State Building and Construction Account (SBCA). LTCA funds were transferred to the General Fund to help balance the state budget. SBCA is funded through bonds that are sold by the state treasurer. Ecology must provide estimates of the cash flow needs for the account. Therefore, using SBCA funding requires the development and monitoring of spending plans.

Local governments use their CPG funds to implement their solid and hazardous waste programs. Current budget concerns in the state are putting pressure on all fund sources. One of our key initiatives over the next year will be to preserve dedicated accounts for solid waste management in Washington State.
The CPG Program is administered by Ecology through *WAC 173-312*, following the intent of the *Model Toxics Control Act (Chapter 70.105D RCW)* to:

- Fund local government projects that greatly reduce contamination of the environment.
- Provide funding assistance to local governments for local solid and hazardous waste planning and for carrying out some projects in those plans.
- Encourage local responsibility for solid and hazardous waste management.
- Promote regional solutions and cooperation between governments.

LTCA revenue is from the Hazardous Substance Tax (HST), a tax on the first possession of hazardous substances in the state. Projected revenues to LTCA available each biennium for CPG are divided into two portions: 80 percent for Solid and Hazardous Waste Planning and Implementation grants and 20 percent for Solid Waste Enforcement grants.

Eligibility

Eligible applicants for CPG grants include:

- ✓ Local planning authorities.
- ✓ Agencies designated as lead implementation agencies for Local Comprehensive Solid Waste Management Plans.
- ✓ Jurisdictional health departments (JHDs).

[2] Authorized by RCW 82.21.030 (Chapter 82.21 RCW, *Hazardous substance tax -- Model toxics control act).*

Ecology allocates available funds on a county-by-county basis, using a base amount for each county plus a per capita amount. Cities that are independent planning authorities and coordinate with counties are eligible to ask for and may receive funding up to the per capita allocation for their city. The availability and amount of funding depends upon legislative appropriations to the LTCA. However, bonding authority through the SBCA provides funding for the 2009-11 Biennium.

Awards

The Coordinated Prevention Grant Program awards funds in two cycles, regular and offset:

- *Regular Cycle.* Ecology allocates regular cycle funds based on the 80 percent allocation for Solid and Hazardous Waste Planning and Implementation grants and 20 percent for Solid Waste Enforcement grants. CPG funds are distributed to recipients requesting their full or partial allocation in the regular cycle.

- *Offset Cycle.* Funds for the offset cycle come from funds that no one requests in the regular cycle ("unrequested" funds) and from funds that no one spent during the regular cycle ("unspent" funds). Funds can also come from any special legislative appropriations. Ecology awards offset cycle funds through a competitive process. There was no offset cycle for 2009-10 because of a lack of funding.

The 2009-11 Biennial Budget approved by the Legislature was $10 million. The $10 million included both the regular cycle projects and Beyond Waste projects:

- $6 million for the regular cycle to help local governments carry out their solid and hazardous waste management plans including recycling, household hazardous waste collection and solid waste enforcement.

- $4 million for grants to fund new organics composting and conversion, green building and moderate risk waste initiatives described in the state's *Beyond Waste Plan*. The 2010-11 regular cycle funds were awarded to 118 Washington counties, cities and JHDs totaling $10,110,548 (*includes $110,548* of unspent funds from 2008)**.** Of these, 44 grants were for Beyond Waste projects totaling $4 million. Both regular cycle projects and Beyond Waste projects began January 1, 2010.

Table 2.7
CPG Funds Distribution for Each Project Category

	Regular Cycle 1/1/10 – 12/31/11
Organics	$1,063,162
Moderate Risk Waste	$4,566,662
Waste Reduction and Recycling	$2,589,782
Solid Waste Enforcement	$1,788,217
Green Building	$55,631
Other	$47,094
LTCA Funds	**$10,110,548**

Local Government Efforts Implementing Beyond Waste Vision Using CPG Funds

Local governments are carrying out programs that support the *Beyond Waste* vision. Examples of current projects are described below, highlighting efforts in Green Building, Recycling of Organics and Reducing Threats from Small-Volume Hazardous Wastes. Local government projects that Ecology typically funds include:

- **Organics.** Local governments are helping communities reduce waste from organic materials. Local governments are building or expanding regional composting facilities, setting up commercial and residential food waste collection programs, and offering yard waste chipping options. They are also educating citizens and businesses on options to reduce waste. These options include food rescue programs, and home/onsite composting. Some examples of projects include:

  - City of Woodinville hosted events for residents to drop off woody debris that was then chipped and used as mulch in citywide native planting and habitat restoration programs.
  - Grant County Public Works maintained a demonstration compost pile at the Moses Lake Community Garden and provided backyard composting workshops for county residents.
  - Klickitat County Solid Waste Department developed an education program on organic waste reduction and gauged public awareness and need through workshops, a website, hotline and annual survey.

- **Green Building.** "Green Building" as defined by the U.S. Green Building Council is ". . . *design and construction practices that significantly reduce or eliminate the negative impact of buildings on the environment and occupants in five broad areas: sustainable site planning; conservation of materials and resources; energy efficiency and renewable energy; safeguarding water and water efficiency; and indoor air quality.*"

Local governments are encouraging construction of high-performance "green" buildings. They educate builders and give public recognition to those who "build green." Local governments also help builders reuse materials and construct demonstration buildings. Examples of projects include:

- Lewis County Solid Waste Utility trained scale attendants at transfer stations to monitor construction and demolition loads for proper segregation, increasing reuse and recycling of these materials.
- City of Lake Forest Park developed green building and low impact development building codes in partnership with the Planning Department, Planning Commission and the City Council.

- **Waste Reduction and Recycling.** Local governments provide residential and commercial recycling, technical help to businesses, recycling collection events, education programs, onsite waste audits and recycling drop-off locations. These activities help support the vision of *Beyond Waste* and raise Washington's recycling rate. Examples of projects include:

  - Thurston County Public Works supplied recycling stations at public areas and events and expanded the program to include the collection of food scraps.
  - City of Spokane conducted waste audits at businesses to introduce or improve recycling and environmentally preferable purchasing polices.
  - City of Everett provided recycling outreach and technical assistance to multi-family property owners, managers and tenants to improve this target audience's typically low recycling rate.

- **Hazardous Waste.** Local governments help businesses and residents reduce and properly dispose of hazardous waste by building and maintaining hazardous waste collection facilities and conducting special collection events. Local governments also help small businesses with technical matters, promote use of less toxic products, and work with others to find solutions for problem wastes such as electronics and mercury. Examples of projects include:

  - Tacoma-Pierce County Health Department conducted one-on-one regulatory technical assistance site visits with small businesses to ensure proper handling, storage and disposal of hazardous waste and materials and encouraged less toxic alternatives.
  - Okanogan County Public Works operates a household hazardous waste facility, providing safe and convenient collection of household and small business hazardous waste.
  - Franklin County Solid Waste Department provided interactive presentations to citizens and educators as well as mass media announcements on proper household hazardous waste handling and local disposal options.

- **Solid and Hazardous Waste Planning.** Local governments work in cooperation with public officials, local solid waste advisory committees and the public to develop plans for their communities. These plans outline effective approaches to reduce their solid and hazardous wastes.

- **Solid Waste Enforcement.** Local governments enforce the solid waste laws and local ordinances. They enforce them by permitting and inspecting facilities; responding to complaints about illegal dumping and improper waste handling or storage; and issuing citations.

Grants to Citizens - Public Participation Grants (PPG)

Purpose

Washington's *Chapter 170.105D RCW, Hazardous Waste Cleanup - Model Toxics Control Act* provides for a Public Participation Grant (PPG) Program. Public Participation Grants provide funding to citizen groups and not-for-profit public interest organizations. These grants encourage public involvement in monitoring cleanup of contaminated sites and pollution prevention through waste reduction/elimination. PPG can fund up to $120,000 for a two-year project and there is no requirement for matching funds. There are two types of PPG Projects:

1. *Contaminated Site Projects* encourage public involvement in investigation and cleanup of contaminated sites. Examples include community oversight of the Hanford, Duwamish River, and Spokane River cleanups.

2. *Waste Management Projects* encourage public involvement to eliminate and reduce waste. Examples include:

    - Providing information on recycling and sustainability to low-income communities.
    - Providing information for homeowners about the dangers of pesticides and hazardous household products.
    - Educational campaigns to keep toxic materials out of Puget Sound.

Fiscal Year 2010

Due to budget constraints and pressure on the Model Toxics Control Account (MTCA) used to fund PPG, the Legislature funded PPG at 0.05 percent rather than the usual 1 percent. In 2007-09, PPG allocated $3.6 million. In 2009-11, PPG allocated less than $1.3 million.

Conversely, more organizations submitted applications to PPG in 2009 than any previous year. When the application period ended, PPG received 121 applications requesting more than $9.3 million in funding. Contaminated site applications alone exceeded more than $1.7 million in requests.

Due to supplemental funding from the U.S. Department of Energy, PPG was able to fund 30 projects totaling more than $1.6 million.

Table 2.8
Sample PPG Projects for 2010

Organization	County	Purpose	Funding Awarded
Facing the Future	Statewide	Development of environmental education curriculum materials and a web-based product focused towards education professionals across the state.	$80,000
Puget Soundkeeper Alliance	Puget Sound Basin	Promote pollution prevention from boating practices through environmental education of best management strategies and clean marina certifications.	$53,000
Habitat for Humanity of Washington State	Statewide	Develop and apply integrated sustainable/green planning and construction of affordable housing in Washington.	$65,000
Washington State Hotel and Lodging Association	Statewide	Promote sustainable practices within the lodging industry through a pilot program and measure environmental and economic benefits.	$53,000
Methow Recycles	Okanogan	Increase recycling education in area schools and develop a collection infrastructure for mercury-containing light bulbs.	$11,700
Port Townsend Marine Science Center	Puget Sound Basin	Increase citizen participation involving plastics cleanup around the Puget Sound Basin and study plastics accumulation in Puget Sound.	$60,000
YMCA of Tacoma-Pierce County	Puget Sound Basin	Provide scholarships to low-income students to enable participation in an environmental education camp.	$66,000
Spokane Neighborhood Action Programs	Spokane, Stevens, Pend Oreille	Promote toxics reduction to Eastern Washington communities through classes, presentations and community newsletters.	$40,000
Evergreen Habitat for Humanity	Clark	Increase landfill diversion of reusable building materials through marketing and education.	$72,000
Washington Citizens for Resource Conservation	Statewide	Educate citizens and community leaders about producer responsibility to encourage proper management of toxic and hard to recycle products.	$50,000
Sustainable Connections	Whatcom	Advance Green Building in housing and industry and reduce/reuse construction waste.	$52,000
Walla Walla Area Resource Conservation	Walla Walla	Assist businesses to encourage sustainable practices such as waste reduction, environmentally preferable purchasing, recycling, and toxics reduction.	$25,700

Organization	County	Purpose	Funding Awarded
Washington Agricultural Family Assistance	Grant	Work to reduce/eliminate exposure of toxins to migrant workers and their families.	$48,200
Washington Physicians for Social Responsibility	Benton	Promote citizen involvement in the Hanford cleanup process. Educate Washingtonians on past, present and future Hanford cleanup developments.	$102,000
Hanford Challenge	Benton	Provide public outreach to increase participation in the Hanford cleanup process specifically targeting diverse and traditionally disengaged communities.	$120,000
Skykomish Environmental Coalition	King	Promote citizen involvement pertaining to the cleanup of the BNSF site in the town of Skykomish.	$20,000
Heart of America	Benton	Promote citizen involvement in the Hanford cleanup process. Educate Washingtonians on past, present and future Hanford cleanup developments.	$120,000
Brackett's Landing Foundation	Snohomish	Promote citizen involvement and education related to the UNOCAL/Chevron cleanup site at Port Edwards, Edmonds.	$36,000
Citizen's for a Healthy Bay	Pierce	Promote citizen involvement and education related to the cleanup sites and wastewater prevention in Commencement Bay.	$42,000
Duwamish River Cleanup Coalition	King	Promote citizen involvement and education related to the cleanup sites and wastewater prevention along the Duwamish River.	$45,000
Salish Sea Expeditions	King	Educate Washington middle school and high school students on the environmental health of Puget Sound.	$45,000
Georgetown Community Council	King	Educate and involve the local community in the Philip Services Corporation Georgetown cleanup process.	$42,000
Lake Roosevelt Forum	Ferry, Grant, Lincoln, Stevens	Improve citizen education and involvement in the Lake Roosevelt Remedial Investigation and Feasibility Study related to the site's cleanup process.	$47,200
Port Gamble/S'Klallam Foundation	Jefferson, Kitsap, Mason	Promote citizen involvement and education related to cleanup efforts in Port Gamble Bay and Hood Canal.	$60,000

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 decisions about solid waste handling based on approved and "current" comprehensive solid waste management plans *(RCW 70.95.110(1)).*

Comprehensive plans detail all solid waste handling facilities within a county. The plans estimate the long-range needs for solid waste facilities over a 20-year period. The state intended these plans to guide a county as it lays the foundation for its solid waste system. Since 1989, the state has required counties and cities to provide detailed information on waste reduction strategies and recycling programs, along with schedules to carry out the programs. They are to maintain the plans in "current condition."

In 1985, the Legislature amended the *Hazardous Waste Management Act*, C*hapter 70.105 RCW*, to require local governments, or a combination of neighboring local governments to prepare plans to manage moderate risk waste (MRW). By 1991, all local governments submitted local hazardous waste plans. Every local hazardous waste plan includes parts on MRW public education, MRW enforcement, household hazardous waste (HHW) collection and technical and disposal assistance to conditionally exempt small quantity generators (CESQGs).

In 1991, the Legislature enacted the *Used Oil Recycling Act*, C*hapter 70.95I RCW*, which required local governments to amend their hazardous waste plans to include used motor oil from households.

Since their hazardous waste plans were completed, some counties have revised them. Some have combined their solid waste and hazardous waste plans. One recommendation of the *Beyond Waste Plan* is to fully implement local hazardous waste plans.

In 2010, Ecology updated the *Guidelines for the Development of Local Solid Waste Plans and Plan Revisions* and the *Guidelines for Developing and Updating Local Hazardous Waste Plans.* Both documents and other planning information are available at http://www.ecy.wa.gov/programs/swfa/localplan.html.

Ecology provides technical assistance to local governments as they prepare and carry out their plans, and also approves them. Table 2.9 lists local solid waste plans and hazardous waste plans for each county and one city (Seattle) that do individual plans.

Table 2.9
Current Status of Solid & Hazardous Waste Plans
in Washington as of November 2010

County	SW Plan Last Approved	WR/R Goal	HW Plan Last Approved	Combined Plans?* (Yes/No)	Comments
Adams	2005	50% WR/R BY 2012	1992	No	Comprehensive Solid Waste Management Plan (CSWMP) updated April 2005. Hazardous Waste Plan (HW) is joint with Adams, Lincoln and Grant Counties.
Asotin	1998	26% by 1997	1993	No	Preliminary Plan review completed. Awaiting final draft for plan dated April 2010.
Benton	2007	50% by 2020	1991	Yes	CSWMP approved July 2007.
Chelan	2007	25% recycling rate by 2010 5% reduction from the current waste stream by 2010	1990	Yes	CSWMP updated April 2007.
Clallam	2007	30% in next 5 years, 40% long-term goal	1991	No	No plans to update HW plan.
Clark	2008	50% WRR by 1995	2002	Yes	CSWMP approved.
Columbia	2003	20% WR/R	1991	No	CSWMP approved. HW Plan being split from joint plan with Walla Walla and written as new standalone for Columbia County. Consultant hired, SWAC reconstituted. Preliminary plan update in process.
Cowlitz	2008	50% WRR by 1995	1993	Yes - See comments	CSWMP approved. Scheduled to update the hazardous waste plan as a chapter within the CSWMP during 2010.
Douglas	2010	10% residential recycling, 10% commercial recycling, and 20% public sector recycling by 2015	2010	Yes	CSWMP approved October 2010.
Ferry	1993	35% WR/R by 1995 50% WR/R by 2013	1994	No	Preliminary review completed. Awaiting final plan submission.

County	SW Plan Last Approved	WR/R Goal	HW Plan Last Approved	Combined Plans?* (Yes/No)	Comments
Franklin	1994	35% R by 1995 5% WR by 1998	1993	No	Preliminary plan reviewed. Adoption of final plan expected in first quarter 2011.
Garfield	2008	26% WR/R by 1997	1992	No	CSWMP approved September 2008.
Grays Harbor	2007	50% WRR by 1995	1991	No	Requested Ecology to do an informal review of their draft plan, expect a final draft by January 2009. As of 1/2010: no update. Will start on HW plan after completing SW plan.
Island	2008	Assist the State in achieving its goal of 50%	2008	Yes	Plan approved April 1, 2008.
Jefferson	2007	At 46.1% using state definition, goal of 50%	1991	No	Considering a review of HW plan.
King	2002	50% residential by 2006 43% nonresidential by 2006	2010	No	Latest CSWMP calls for targets to be evaluated every 3 years as new data becomes available. CSWMP draft update went out for public comment on October 8, 2009. The preliminary draft will be submitted to Ecology in December 2010. Because the city of Seattle and King County have independent CSWMPs, the HW plan remains independent. The HW plan was approved on July 8, 2010.
King - Seattle	2005	Recycle or compost: 60% of all waste generated in Seattle by 2012; 70% by 2025	2010	No	Because the city of Seattle and King County have independent CSWMPs, the HW plan remains independent. The HW plan was approved on July 8, 2010. The preliminary CSWMP draft will be submitted to Ecology in October 2011.

County	SW Plan Last Approved	WR/R Goal	HW Plan Last Approved	Combined Plans?* (Yes/No)	Comments
Kitsap	2000	Supports the state goal of reaching 50% recycling.	2000	Yes	CSWMP includes an update to the 1990 HW Plan. The text is fully integrated into the 2000 CSWMP. The preliminary CSWMP draft was submitted to Ecology on May 10, 2010. The final draft will be submitted in January 2011. .
Kittitas	2003	50% by 2008	1991	Yes	Plan is currently under revision. Preliminary draft expected early 2011.
Klickitat	2000	50% diversion	2000	Yes	SWAC has been reconvened, and the plan is under revision.
Lewis	2008	18% WRR by 1995, no goal	2000	Yes	Scheduled to update the hazardous waste plan within the CSWMP during 2010.
Lincoln	1999	35% WR/R by 1997	1992	No	Preliminary plan review completed. Awaiting final draft submission.
Mason	2007	Mentions state goal of 50% by 2007	1991	No	Currently in review to update HW plan; plan will continue to be standalone.
Okanogan	2006	Supports the state goal of reaching 50% recycling	1991	Yes	Plan is currently under revision.
Pacific	2008	At 14.4% in 2005, goal to reach 25%	1990 – 2000 Operations Plan	No	No plans to update HW plan.
Pend Oreille	2002	45% WR/R by 2015	1993	No	Preliminary plan review completed. Awaiting final draft for review.
Pierce	2008	50% WRR by 1995	1990	No	Updating a separate HW plan during 2010/2011.
San Juan	1996	50% by 1995	1991 (with 1998 update that includes used oil plan)	No	Has begun plan update, and is combining HW and SW plans. Plan completion possible in 2012.
Skagit	2005 (amended 2008)	50% diversion	1992	No	Has just started update process for SW plan. No plan to update HW plan. Possible completion 2012.

County	SW Plan Last Approved	WR/R Goal	HW Plan Last Approved	Combined Plans?* (Yes/No)	Comments
Skamania	2001	40% WRR by 1998 50% long range goal	2001	Yes	Started updating CSWMP April 2006. Scheduled to complete update of CSWMP with hazardous waste chapter during 2010.
Snohomish	2004	50% recycling goal to be reached approximately 2008	1993	Partially	The 2001 CSWMP is intended to begin consolidation of the HW Plan, to update but not replace it. The CSWMP was updated in 2004 to include replacement of two solid waste facilities and include the city of Everett under the county's solid waste system. CSWMP and HW Plan revisions began in 2009, expecting to submit the preliminary draft in March 2011.
Spokane	1998	50% recycling by 2008	1993	No	Final CSWMP draft adopted by County Commissioners and circulated to local governments for adoption. Expect completion by end of 4th quarter 2010.
Stevens	2008	36% WR/R by 2012	1993	No	CSWMP completed and approved in July 2008.
Thurston	2001	Increase recycling rate by 2.5% by 2005	1993	No	Preliminary draft expected by March 2010. Currently reviewing HW plan.
Wahkiakum	2008	20% WRR by 1996	2001	No	Plan approved 2008. Will not have a county hazardous waste plan. Wahkiakum service is included in the Cowlitz County plan.
Walla Walla	1994	40% by 2002	1991	No	City of Walla Walla by inter local agreement assumed responsibility for preparation of CSWMP. New staff hired. SWAC reconstituted. Consultant RFQ under preparation. Waiting for new CPG funding cycle to qualify for planning grant.

County	SW Plan Last Approved	WR/R Goal	HW Plan Last Approved	Combined Plans?* (Yes/No)	Comments
Whatcom	2010	50% diversion	2010	Yes	New combined SW-HW plan approved 2010, but dated 2008. Note: This new plan is to be read concurrently with the previous SW and HW plans (3 books at once). We don't allow this practice anymore.
Whatcom	1999	50% diversion	1991	No - Soon.	County currently updating CSWMP. Received draft in November 2008, and is almost in final form. The City of Bellingham is no longer the lead on MRW, and the county has combined SW and HW plans.
Whitman	2006	40% WR/R by 2001	1992	No	Plan approved and current. Plan revisions currently under consideration.
Yakima	2010	Support the state's recycling goal of 50%	2010	Yes	Plan approved June 2010.

*Combined plans approved prior to 2010 are not considered full revisions of the Local Hazardous Waste Management Plan (LHWP). New planning guidelines were published in 2010 that define a clear process for incorporating LHWPs into Comprehensive Solid Waste Management Plans. Combined plans approved after 2010 are required to meet the planning requirements prescribed in 70.105 RCW & 70.95I RCW. All other combined plans prior to 2010 were only approved in accordance with the solid waste planning requirements prescribed in 70.95 RCW, thus are not official LHWP updates.

Partnering for the Environment through Outreach, Assistance and Information Sharing

Washington State Solid Waste Information Clearinghouse

The year 2010 marked the first full year the completed site was in use (https://fortress.wa.gov/ecy/swicpublic/). As of November 1, 2010, the site had almost 200 registered users and contained 900 projects, 558 resources, 260 solid waste staff contacts and 95 health department staff contacts.

Now that the site is fully functional, the main challenge is getting the local city and county profiles populated with data. This relies on a partnership between Ecology and local governments, as each is responsible for updating various pieces of the profiles. Ecology will continue to maintain and market the site to ensure it becomes the resource local governments envisioned nearly a decade ago.

A committee of several local government staff worked with Ecology to plan and develop the information sharing website. The Information Clearinghouse allows CPG recipients to report work accomplished online and share lessons learned with others statewide. This helps all recipients to strengthen their programs. The site also contains information on PPG projects, as well as non-grant funded projects submitted by local governments. The system will collect and maintain information about county and city programs, and facilitate sharing tools and resources.

The main audience for this site is local government solid and hazardous waste and health department staff. The site became accessible to the public in late 2008. The Information Clearinghouse includes:

- State Profile
- County and City Profiles
- Local Projects
- Outreach Materials & other Resources
- Calendar of Events
- Classified Ads

To learn more about the Information Clearinghouse, contact Shannon McClelland, Project Coordinator, at 360-407-6398 or Shannon.McClelland@ecy.wa.gov.

Landfill and Incinerator Operator Certification Programs

Washington State law requires solid waste landfills and incinerators to have certified operators onsite at all times (*Chapter 70.95D RCW, Solid Waste Incinerator and Landfill Operators*). The Legislature created the Landfill and Incinerator Operator Certification program in 1989 through the "*Waste Not Washington Act.*" To carry out the law, the state adopted a rule in June 1991 (*Chapter 173-300 WAC, Certification of Operators of Solid Waste Incinerators and Landfill Facilities*).

The requirement to have certified operators onsite at all times applies to the following types of facilities:

- Municipal solid waste landfills.
- Inert landfills.
- Limited purpose landfills.
- All incinerators that burn solid waste.

The law also requires any person officially inspecting these solid waste facilities be a certified operator. See Chapter 1: Issues Facing Washington State for proposed changes to the certification program.

In February 2004, Ecology reached an agreement with the Solid Waste Association of North America (SWANA) to conduct training, testing, continuing education, recertification and

program administration for landfill certification. SWANA annually provides Ecology with a list of currently certified persons. Ecology notifies interested parties of upcoming training and testing. The incinerator certification program continues to be Ecology's responsibility.
In 2009, there were 173 active certifications for landfill operators and 79 active certifications for incinerator operators.

Recognizing Waste Reduction and Recycling Efforts: Terry Husseman Sustainable School Award Program

Ecology's award program recognizes Washington's primary and secondary schools for developing and managing environmental education and sustainability programs. Both public and private schools are eligible to apply. Schools are selected for the creative features of their programs and ability to promote sustainable behavior change by reducing waste, increasing recycling, and conserving resources. The program rewards schools for developing innovative environmental curriculum or operating successful programs that inspire a sense of environmental stewardship in students.

On May 21, 2010 Ecology Director Ted Sturdevant and Laurie Davies, W2R Program Manager, presented $28,975 in cash awards to 45 schools across the state. About 100 schoolchildren filled the auditorium of the Department of Social and Health Services headquarters building in Olympia to celebrate their schools' exceptional sustainability efforts.
Guests and other visitors enjoyed the educational displays hosted by Ecology organics staff. After enjoying organic refreshments, guests could contribute their leftovers to the Ecology composting bin and recycle their drink containers.

Awards are presented in three categories:

1. The *Seed Award* assists schools with costs of starting waste reduction, recycling and sustainability programs. In 2010, 16 schools received Seed Awards ranging from $150 to $3,150.

2. The *Sustainable School Award* helps schools continue and expand ongoing programs that focus on waste reduction, recycling and sustainability. In 2010, 24 schools received Sustainable School Awards ranging from $300 to $500.

3. The *Environmental Curriculum Award* encourages schools to develop original curricula to teach environmental awareness in Washington schools. It should introduce students, teachers, staff and administrators to concepts of sustainability including social, economic and environmental relevance. In 2010, five schools received Environmental Curriculum Awards ranging from $500 to $750.

The *Environmental Curriculum* awards went to hands-on programs that incorporate scientific methodology with environmental and sustainability issues of urban and rural ecosystems. Many of this year's *Seed and Sustainable School* award programs involved food waste composting, green purchasing, and energy conservation. Some projects help their communities by expanding recycling, restoring habitat, and creating community gardens.

Table 2.10 lists the 2009-10 winners of the Terry Husseman Sustainable School Awards.

Table 2.10
2009-10 Terry Husseman Sustainable Public School Award Recipients

School	School District	County	Award Amount
Seed Awards			
Creston School	Creston	Lincoln	$3,150
Explorations Academy	Bellingham	Whatcom	$640
Gaiser Middle School	Vancouver	Clark	$750
Ilwaco Middle/High School	Ocean Beach	Pacific	$1,500
Jane Addams School	Seattle	King	$1,300
Lincoln Elementary School	Mount Vernon	Skagit	$1,000
Long Beach Elementary School & Ocean Park Elementary School	Ocean Beach	Pacific	$750
Madison Elementary School	Olympia	Thurston	$930
Mountain View Elementary	Quincy	Grant	$500
Nooksack Valley High School	Nooksack Valley	Whatcom	$600
North Beach Elementary School	Seattle	King	$750
Prairie High School	Battle Ground	Clark	$150
Quincy Valley School	Quincy	Grant	$605
Southridge High School	Kennewick	Benton	$1,000
St. Anne School	NA	King	$1,500
West Sound Academy	Kitsap	Kitsap	$1,000
Sustainable School Awards			
Columbia River High School	Vancouver	Clark	$500
Custer Elementary School	Ferndale	Whatcom	$300
Discovery Lab School	Yakima	Yakima	$500
Eckstein Middle School	Seattle	King	$500
Franklin Elementary School	Port Angeles	Clallam	$500
Gatewood Elementary	Seattle	King	$500
Heritage High School	Evergreen	Clark	$500
Holy Rosary School	Seattle	King	$500
Knolls Vista Elementary	Moses Lake	Grant	$300
Lake Washington Girls Middle School	Seattle	King	$300
Madrona School	Edmonds	Snohomish	$300
Mount Baker High School/Junior High, Kendall Elementary, Acme Elementary, Harmony Elementary	Mount Baker	Whatcom	$500
Naches Valley Middle School	Naches Valley	Yakima	$300
Newcastle Elementary	Issaquah	King	$300
Nooksack Valley High School	Nooksack Valley	Whatcom	$500
Pope Elementary	Puyallup	Pierce	$300

School	School District	County	Award Amount
Roxhill Elementary	Seattle	King	$300
Samantha Smith Elementary	Lake Washington	King	$300
Selah High School	Selah	Yakima	$300
St. Alphonsus Catholic School	NA	King	$500
Union Ridge Elementary School	Ridgefield	Clark	$500
Villa Academy	NA	King	$300
Washington Elementary School	Auburn	King	$500
Woodward Middle School	Bainbridge Island	Kitsap	$300
Environmental Curriculum			
Garfield Middle School	Garfield	Whitman	$750
La Salle High School	Yakima	Yakima	$750
Tahoma Junior High School	Tahoma	King	$500
Waterville School	Waterville	Douglas	$750
West Valley City School	West Valley	Spokane	$500

For more information, visit the Terry Husseman Sustainable Schools Awards site at http://www.ecy.wa.gov/programs/swfa/terryhusseman.html.

The Closed-Loop Scoop Newsletter

The W2R Program publishes a quarterly newsletter called *The Closed-Loop Scoop*. The newsletter shares important information among public works departments, health districts, private recyclers, Ecology, and other clients and stakeholders. The editor encourages all interested parties to contribute articles to update readers on legislative matters, solid waste program successes and ideas, and upcoming meetings. More than 700 individuals and organizations across the state subscribe. Many parties opt to receive their copy electronically. *The Closed-Loop Scoop* is available on the Ecology W2R Program Publications and Forms website at http://www.ecy.wa.gov/programs/swfa/nav/publication.html.

Recycling Information Line

The W2R Program operates a toll-free information line to help citizens find ways to reduce waste and recycle. In 2010, staff helped more than 7,246 callers on the 1-800-RECYCLE hotline. While many callers just want to know where and how to recycle common items, others have more complex questions.

Information line operators use a database to direct callers to locations for safe disposal of household hazardous waste, in addition to recycling facilities across the state. Information on a wide variety of recyclable materials including construction, demolition and land clearing debris, used motor oil and electronics is available. The information line also lists companies that offer commercial pickup for business recycling and residential curbside haulers.

While many local governments operate information lines in their own areas, the statewide information line continues to serve as a first contact for many. Ecology's statewide hotline can also provide callers with information on specialized recycling opportunities including one-time

collection events, and targeted waste streams like mercury-containing items. The E-Cycle Washington (electronics recycling) Program continues to be popular and accounts for about 45 percent of total calls.

Recycling information from the database is available on the information line's website at http://1800recycle.wa.gov. Ecology staff maintains the database by periodically contacting all recyclers to determine commodities handled, location (or areas served) and hours. This website also provides links to other online databases and material exchanges, along with local government and recycling organization websites.

The 1-800-RECYCLE website also includes a web page developed for kids of all ages. The Kids Page at http://www.ecy.wa.gov/programs/swfa/kidspage/ has clever links to other environmental education sites and fun environmental games to play. It also has interesting trivia facts on different recyclable materials.

Chapter 3: Statewide Litter Prevention & Cleanup Programs

Chapter 70.93 RCW, *the Waste Reduction, Recycling, and Model Litter Control Act*, assigns Ecology as the lead agency to manage statewide litter programs. Work on litter control and litter prevention activities in 2010 was curtailed significantly due to budgetary constraints. With limited funding, Ecology was able to put forward the following efforts in litter control and pickup:

- Helped coordinate remaining litter control and prevention activities. Managed allocations from the Waste Reduction, Recycling and Model Litter Control Account.
- Deployed six nine-month Ecology Median litter cleanup crews statewide (EYC).
- Administered the Community Litter Cleanup Program (CLCP).
- Maintained productive partnerships with other state agencies and local governments.

Work activities Ecology could not perform include:

- Carry out the litter prevention campaign.
- Conduct the statewide litter survey.
- Run summer Ecology Youth Corps litter cleanup crews.

Litter Prevention Campaign

The *Litter and it Will Hurt* campaign is the statewide social marketing campaign aimed at reducing litter on Washington roadways. The campaign has used multiple strategies over several years to raise awareness, alter beliefs and ultimately change behaviors about litter. Key elements of the campaign in previous years included:

- ✓ Television, radio, and outdoor (billboard) media.
- ✓ A litter hotline.
- ✓ A roadway signage program.
- ✓ A website.
- ✓ Distribution of litterbags and campaign materials.
- ✓ Enforcement activities.

In 2006, Ecology completed a thorough campaign evaluation. The evaluation confirmed the campaign's messages were having a positive impact on the public's awareness of litter issues, attitudes toward littering behavior and most important, the amount of litter in the state. The evaluation led to a new three-year campaign plan to focus the campaign on enforcement and potentially dangerous litter, especially unsecured loads. This effort ended in 2009.

No comprehensive campaign was run in 2010. Only the Litter Hotline, roadway signage program and website remain from the campaign.

Secured Load Materials and Website

Prior to 2010, Ecology spent significant time promoting the secured load issue: the need to properly secure all vehicle loads to prevent escape of debris. A telephone survey of Washington residents showed that people became more aware of the issue. After several weeks of advertising, awareness rose to 51 percent in June 2008, compared to 38 percent in March 2007. Awareness went down to 44 percent in June 2009.

Due to budgetary constraints, Ecology was unable to conduct a survey in 2010 to measure and quantify changes in awareness.

Enforcement Activities

Over the years, Ecology has collaborated with law enforcement to conduct litter emphasis patrols. The last emphasis patrols we funded were in April 2009 when the Clark County Sheriff's Office, and the Clark and King County Washington State Patrol (WSP) district conducted unsecured load emphasis patrols. Emphasis patrols are an efficient way to have law enforcement focus on litter. The 2009 effort lasted 8 weeks, and law enforcement officers logged 532 hours and made 515 educational contacts resulting in 195 litter citations.

We were unable to fund any emphasis patrols in 2010.

Litter Hotline Program

The Litter Hotline is a toll-free phone line (1-866-LITTER-1) available for the public to report littering incidents they witness, such as a person throwing something out the window of a vehicle or an item falling from an unsecured load.

Ecology operates the Litter Hotline in cooperation with WSP and the Washington State Department of Licensing. WSP sends letters to registered owners of vehicles reported via the hotline to notify them of reported incidents and littering fines. The hotline currently is the only operating component of the litter prevention campaign.

In May 2009, Ecology produced a Litter Hotline jingle and paid for advertising on radio stations statewide. As a result of the jingle, the Litter Hotline received its highest call volume: 4,111 calls were received in June 2009. From January through October 2009, the hotline logged a total of 19,592 calls. This was 2,100 more than from January to October in 2007, the year when the

hotline recorded the second highest volume of calls. Since the end of advertising for the hotline, calls have dropped off significantly. Call volume through October 2010 was down by nearly half (11,001 calls). The highest volume of calls received in any one month in 2010 was 1,253. In 2009, there were six months that had higher totals than that.

Ecology evaluated the effectiveness of the Litter Hotline by analyzing responses to an anonymous survey of those who receive hotline letters. Since the 2006 evaluation of the hotline, there was:

- A 5 percent increase in those who thought they would be caught and fined by law enforcement (68 percent in 2006 and 73 percent in 2009).

- No increase in those who said they would not litter in the future (92 percent in 2006 and 92 percent in 2009).

- A decrease in those who thought the hotline program was effective as an educational tool and litter preventative (78 percent in 2006 and 68 percent in 2009).

We were unable to perform a similar evaluation in 2010 due to budget cuts.

Litter Program Fund Allocation

The Waste Reduction, Recycling and Model Litter Control Account (WRRMLCA) supports a variety of programs. The legislation (*Chapter 70.93 RCW*) directs fund allocation as follows:

- 20 percent to local government programs (CLCP).
- 30 percent to waste reduction and recycling efforts within Ecology.
- 50 percent to litter cleanup and prevention efforts, as well as administrative costs.

Besides providing monies for the Ecology Youth Corps (EYC), the 50 percent dedicated to cleanup efforts also pays for litter activities carried out by other state agencies.

For this biennium (July 2009 – June 2011), there was a $4.4 million cut to the Litter Account in 2009 and an additional $2.09 million cut in 2010, or approximately 6.5 million for the biennium. This was more than one third of the entire WRRMLCA budget for 2009-11.

The Legislature lifted the allocation requirements for July 2009 – June 2011 only. The final budget from the WRRMLCA was $12.47 million divided as follows:

- $1.34 million to Local Government Funding Programs.
- $5.29 million to Waste Reduction & Recycling Activities.
- $5.84 million to Litter Cleanup & Prevention.

Funding cuts will result in more litter created and less litter picked up. Some specific results of the cuts include:

- Ecology could not hire any youth to pick up litter in summer 2010.
- We had to suspend most of the Litter and it will Hurt campaign. Only the toll-free hotline, roadway signs and the Ecology-hosted website remain to discourage state residents from littering by providing the public a way to report it.
- WSP still enforces state litter laws, but there were not any Ecology funded emphasis patrols.
- We reduced funding to other state agencies for their litter pickup efforts.
- We reduced Ecology's litter program by four positions, leaving only one FTE split among the four Ecology regions to administer CLCP, manage state contracts and oversee the median crew work.

Ecology Youth Corps

2010 marked the 35th year of operation for the Ecology Youth Corps (EYC). The EYC website at www.ecy.wa.gov/programs/swfa/eyc/index.html includes regional hiring information, applications and photos of the EYC in action.

RCW 70.93.020 requires creation of "*jobs for employment of youth in litter cleanup and related activities.*" The EYC operates two types of crews: youth crews and median crews. Youth crews operate in the summer months (June - August). Most median crew activity occurs in the spring and fall, with reduced median crew activity in the summer.

Youth crews consist of members 14-17 years old. They mostly clean shoulder areas and interchanges of major state routes and interstates. More than 2,000 youths from across the state apply annually for approximately 300 positions. Youth crews generally work two four-week summer sessions with a complete turnover of crews occurring mid-summer. With the exception of two summer youths crews financed with monies from the Washington State Department of Transportation (WSDOT), no summer youth crews were hired in 2010.

Median crews consist of young adults 18 years and older. They clean challenging areas of roadways, including medians, complex ramps and interchanges, and exceptionally high-traffic areas.

In 2010, EYC median crews collected litter on state highways in the following counties:

- ✓ Central Region (CRO): Kittitas, and Yakima.
- ✓ Eastern Region (ERO): Adams, Ferry, Franklin, Garfield, Grant, Lincoln, Spokane,
- ✓ Northwest Region (NWRO): King, Skagit, Snohomish, and Whatcom.
- ✓ Southwest Region (SWRO): Clark, Cowlitz, Lewis, Pierce, and Thurston.

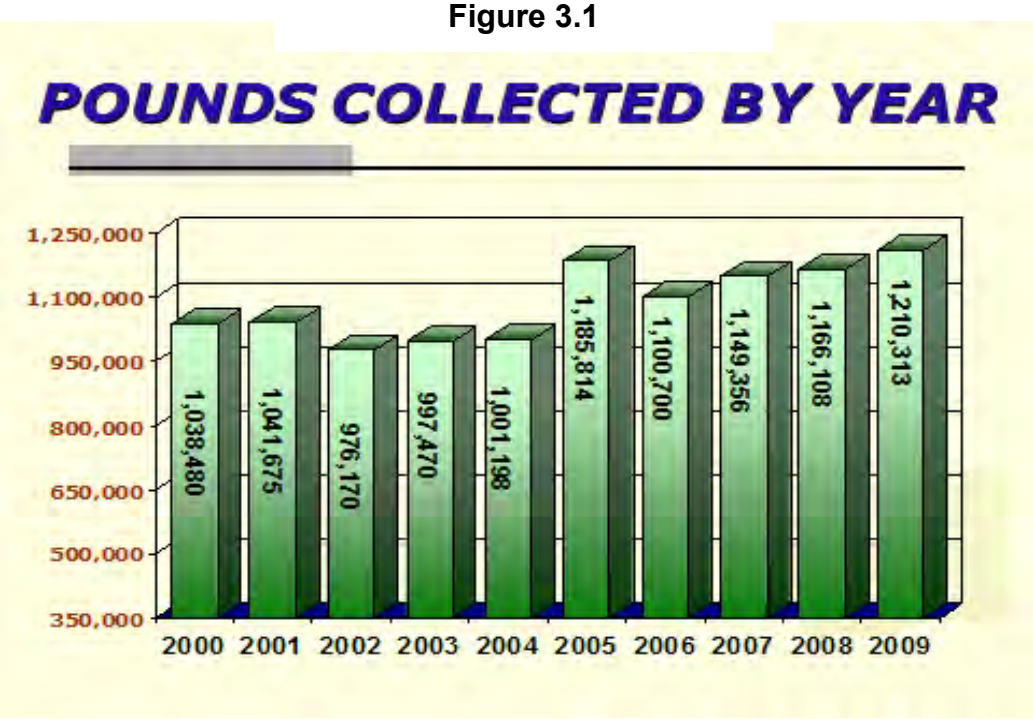
Table 3.1 summarizes EYC work for 2009.

Table 3.1
Ecology Youth Corps Program Outputs
January 1 – December 31, 2009

Total Hours Worked (Supervisor + Crew)	71,351
Total Pounds Collected (Litter + Illegal Dump + Recycled)	1,210,313
Miles	5,313
Acres	475
Number of Illegal Dumps Cleaned	157

Figure 3.1 shows the amount of litter the EYC has picked up from 2000-09.

Figure 3.1



Ecology continues to operate the EYC in partnership with WSDOT. WSDOT hires the crew supervisors, and Ecology manages all other aspects of the program. The interagency agreement covering this arrangement between Ecology and WSDOT expires in June 2011.

Litter Survey

Ecology conducts a litter survey every five years to measure the amount and types of litter around the state. The litter survey is a year-long field research project with EYC crews accomplishing a majority of the fieldwork. In summer 2008, Ecology staff completed a

sampling plan in preparation for a new litter survey that included 120 randomly selected roadway sites. The sampling plan includes interstate, state route, county road and highway interchange sites in both urban and nonurban areas.

Ecology cancelled the 2008-09 Litter Survey because of budget cuts and has not attempted to conduct another survey. It may resume when there is enough funding in the budget. Information on previous litter studies are on the litter webpage at http://www.ecy.wa.gov/programs/swfa/litter/public.html#a1.

Community Litter Cleanup Program

In 1998, Ecology created the Community Litter Cleanup Program (CLCP) with the goal of providing financial assistance to local governments to combat litter and illegal dumps on roadways and other public land. CLCP contracts are written on a biennial schedule (two-year period from July-June). The contracts are a key component of statewide litter and illegal dump cleanup programs.

Most local governments participating in CLCP use in-custody (jail) or community service crews to do litter cleanup work. The use of these crews provides significant savings to local jails and returns labor value to communities that participate. Several jurisdictions also use volunteer groups to assist in cleanup and or educational efforts.

For the budget cycle that began in July 2009, Ecology awarded $2.685 million in CLCP funding. All 39 counties applied for and received funds. However, due to budget cuts, Ecology was then forced to cut the awards they had received in half to $1.36 million.

Activities completed through CLCP for 2009 were responsible for over half of all miles cleaned and pounds collected with state litter funding. Table 3.2 highlights the work accomplished in 2009 prior to budget cuts. The numbers for 2010 are expected to drop dramatically. Most counties used their monies in calendar year 2009 and had little left over to fund crews in calendar year 2010.

Table 3.2
Community Litter Cleanup Program Outputs
January 1 – December 31, 2009

Total Hours Worked (Supervisor + Crew)	166,701
Total Pounds Collected (Litter + Illegal Dump + Recycled)	3,078,546
Miles	24,794
Acres	2,179
Number of Illegal Dumps Cleaned	3,194

Litter Cleanup by Other State Agencies

The state agency litter workgroup continues to meet once or twice a year to review activities, improve coordination and discuss funding. The workgroup is comprised of representatives from the departments of Corrections, Natural Resources, Transportation, Fish and Wildlife, Ecology, and the Parks and Recreation Commission. Using a consensus process, the workgroup negotiates the amount each agency receives through interagency agreements to fund litter and illegal dump activities.

All workgroup agencies received a decrease in funding for the 2009-11 Biennium. A majority of the funding received went toward litter pickup and additional correctional crews. Table 3.3 shows the budget for the current biennium.

Table 3.3
Ecology Interagency Agreements for Litter Activities
July 1, 2009 – June 30, 2011

Department of Corrections	$620,000
Department of Fish and Wildlife	20,000
Department of Natural Resources	415,000
Department of Transportation	85,000
Parks and Recreation Commission	40,000
Total	$1,180,000

Parks and Recreation Commission

The Parks and Recreation Commission (Parks) traditionally uses litter funds for waste reduction and recycling efforts, as well as litter and illegal dump cleanup. Park rangers, park users and volunteers do most litter collection. For information on Park's accomplishments, see the "Parks" section on the litter website at http://www.ecy.wa.gov/programs/swfa/litter/who.html#a7.

For the 2009-11 Biennium, Parks litter funding was reduced by $35,000, bringing the current interagency agreement total to $40,000. Parks has continued to clean up litter and illegal dumps, and increase recycling in parks statewide. Their limited funds support enforcement projects such as purchase of surveillance cameras and additional signage.

Any law enforcement officer can enforce litter laws, but it is often not a priority for natural resource agencies. This additional litter funding provides focus for Parks law enforcement staff.

Department of Corrections

The Department of Corrections (DOC) receives funding through Ecology to run community based correctional litter crews on state roads, state lands, and in local communities. For the 2009-11 Biennium, DOC's litter funding was reduced by $5,000, bringing the current

interagency agreement total to $620,000. The funds support crews in Seattle, Tacoma, Monroe, Wenatchee, Ellensburg, Yakima, the Tri-Cities, Moses Lake, Spokane and Walla Walla. Table 3.4 summarizes DOC's litter crew activity in 2009.

Table 3.4
Department of Corrections Litter Removal Activity
January 1 – December 31, 2009

Total Hours Worked (Supervisor + Crew)	61,331
Total Pounds Collected (Litter + Illegal Dump + Recycled)	1,049,473
Miles	2,676
Acres	675
Number of Illegal Dumps Cleaned	1,379

Department of Natural Resources

The Department of Natural Resources Camps Program, in partnership with DOC, puts offender crews to work on state lands. As illustrated by the data in Table 3.5, this program has considerable impact on litter cleanup and illegally dumped materials in state-owned forests. For the 2009-11 Biennium, DNR's litter funding was reduced by $105,000, bringing the current interagency agreement total to $415,000. Table 3.5 summarizes DNR crew activity in 2008.

Table 3.5
Department of Natural Resources Litter Removal Activity
January 1 – December 31, 2009

Total Hours Worked (Supervisor + Crew)	37,758
Total Pounds Collected (Litter + Illegal Dump + Recycled)	595,885
Miles	1,236
Acres	133
Number of Illegal Dumps Cleaned	781

Department of Transportation

The Department of Transportation (WSDOT) is responsible for picking up litter along state roads, including bags of litter collected by Adopt-a-Highway groups, the Ecology Youth Corps and DOC. The old interagency agreement between Ecology and WSDOT provides $85,000 to offset costs of litterbag disposal. A new 2009-11 interagency agreement between Ecology and WSDOT will provide $85,000 to help promote the Adopt-A-Highway Program and recruit participants.

In 2009, WSDOT crews removed and disposed of 3031 tons of litter from state roadways (roughly six million pounds).

Looking Ahead

The upcoming 2011-13 Biennium will be challenging if the budget is as limited as it was in 2009-11. If funding is restored, plans for the Litter Program in 2011 include promotion of the Litter Hotline and coordinating statewide litter pickup programs along with restoring the youth litter pick-up component. Coordination of the litter pickup effort by the various state agencies needs to continue to be strong to achieve the greatest efficiencies. We will continue to evaluate all programs for the best return on dollar spent.

Chapter 4: Solid Waste Generation, Disposal & Recycling in Washington State

One of the basic aspects of carrying out the *Beyond Waste Plan* is to prevent wastes in the first place, rather than manage them at the end of the pipe. Recognizing we will continue to generate many wastes, the *Beyond Waste Plan* also calls for valuing these materials as resources, and moving them into closed-loop recycling systems and other diversion options instead of disposing of them.

To measure the progress of *Beyond Waste*, a record of the amount and types of waste generated is essential. To determine the amount of waste generated in Washington State, Ecology uses the amount of materials disposed each year, plus the amount of materials recycled and diverted from disposal. The way we calculate this number is changing as we gain more understanding of the waste stream and get better information on how wastes are managed.

The long-term trend in the total amount of waste generated climbed until 2005. Recent drops from 2006 through 2009 may indicate we are on our way to improving this trend. The recent recession may have played a part in reducing our waste generation as well.

Washington State's population has continued to grow since Ecology began to track disposal and recycling. Population growth rates in Washington have averaged 1.8 percent per year from 1988 to 2009, with the total population increasing more than two million during that period.[1]

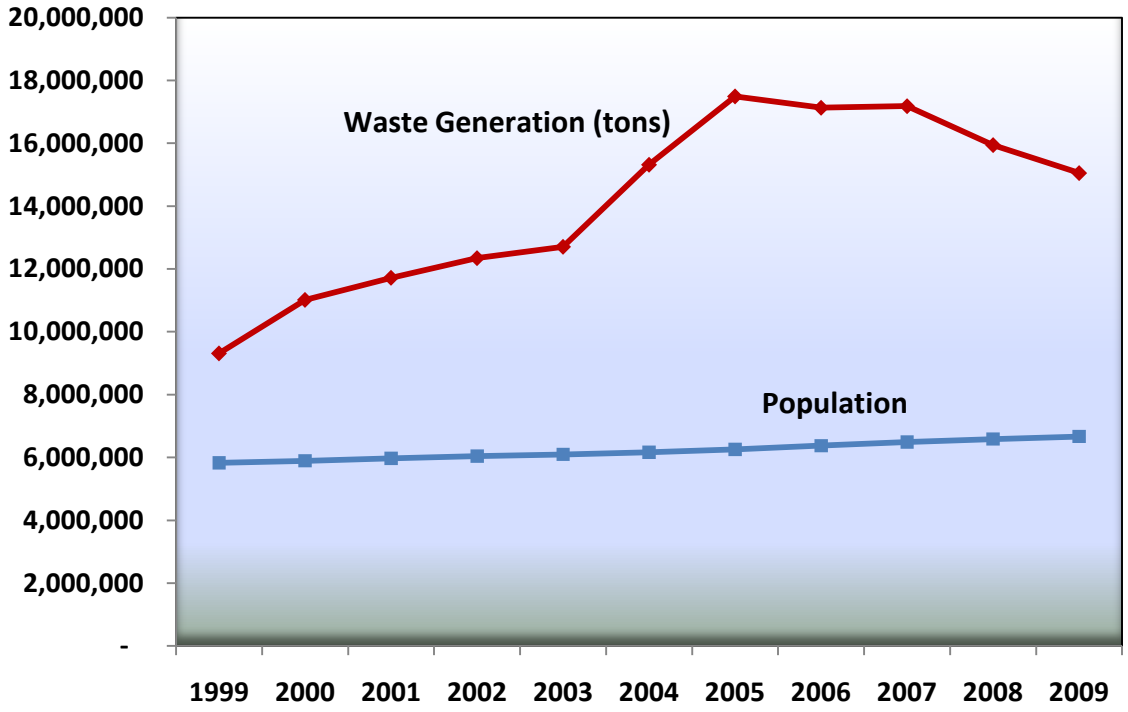
With an increasing population often comes an increase in waste generated, and this has certainly been true for the long-term trend in Washington. However, the trend in the amount of waste disposed of, as well as the amount recycled and diverted, has increased faster than the population trend, adding up to a rise in waste generation in the last decade (see Figure 4.1).

Since 1994, when Ecology began measuring the disposed solid waste stream by tracking annual reports from disposal facilities such as landfills and incinerators, the amount of waste generated per person has grown at an average annual rate of 4 percent. The total amount of waste generated annually since 1994 has increased by more than seven million tons.

Since we began measuring disposed solid wastes back in 1994, Washington citizens have generated more than 193 million tons of solid waste, or about 78 percent of the total solid waste generated in the United States in 2008. This is roughly equivalent to disposing of 96 million cars in a landfill.[2]

[1] Population figures from Office of Financial Management at http://www.ofm.wa.gov/
[2] U.S. Environmental Protection Agency: http://www.epa.gov/otaq/cert/mpg/fetrends/420r10023.pdf.

Figure 4.1
Solid Waste Generation and Population Growth in Washington



Determining the Amount of Waste Generated

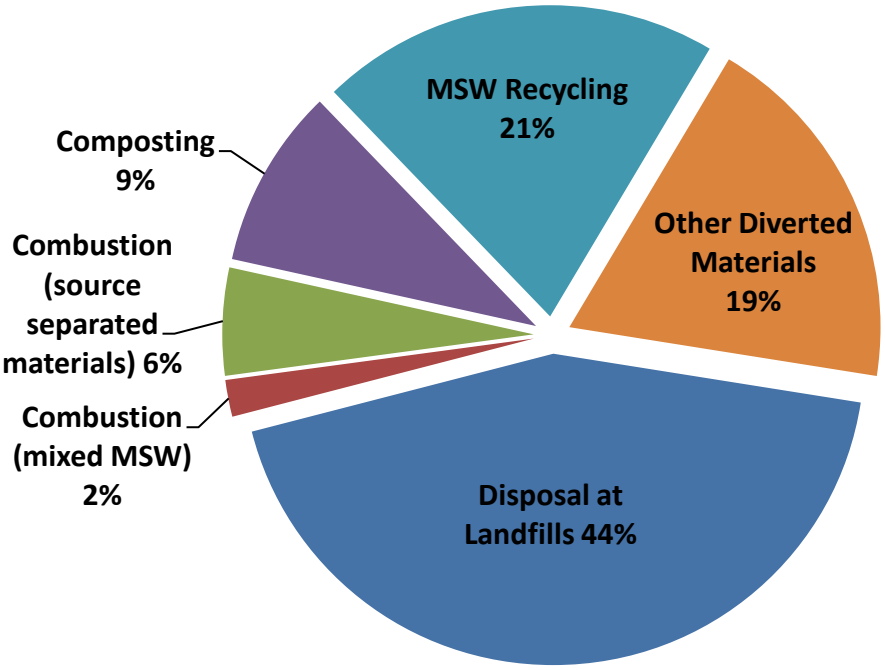
Total waste generation is determined by adding the amount of waste disposed to the amount of material recycled and diverted from disposal. It is easy to see why materials we dispose of in landfills and incinerators are considered part of our "waste." However, materials we separate from disposal for recycling, or some other useful activity other than disposal are also part of our total waste generation. These materials enter the stream of discarded materials that will not be used again in their original form, hence the term "waste," even though these materials will be put toward better uses than landfilling.

Ecology is currently measuring six types of final disposal and waste management methods:

1. Disposal in regulated landfills.
2. Combustion of mixed municipal solid waste (MSW) in regulated incinerators.
3. Combustion of source separated material (burning for energy) in regulated industrial incinerators.
4. Composting in regulated facilities.
5. Recycling (transforming material into the same or other products – MSW only) in regulated and non-regulated facilities.
6. Other Diversion (includes recycling of non-MSW materials and reuse) in regulated and non-regulated facilities.

Figure 4.2 shows a breakdown of the statewide waste management methods in 2009.

Figure 4.2
Waste Management Methods 2009



Some material types have one unique final use, such as aluminum cans that are recycled rather than composted or burned for energy. However, there is often more than one final use for a material reported as "recycled" or "diverted," depending on market shifts and demand. For example, some wood collected for recycling may be used to make composite lumber. Some may be composted and some burned for energy recovery. In 2006, Ecology began asking for a more detailed breakdown of these uses for all materials reported. As recyclers develop systems to track this type of information, data quality is improving.

The largest measured part of Washington's waste generation number is the disposed waste stream. This number has increased over the long-term, but decreased in recent years. The overall long-term increase could be occurring for several reasons. In some cases, we are simply throwing away more. In addition, because of reporting requirements in *Chapter 173-350 WAC, Solid Waste Handling Standards*, we are getting more details on wastes we dispose of through annual reports from facilities. We are also getting information on waste disposed of in other states (e.g. waste tires generated in Washington that are disposed in Oregon and some other states).

We include all materials disposed in landfills that may not have been reported as waste materials in the past. Examples are clean soil and rock, which are not defined as solid waste by our regulations, but disposed as waste or used as alternative daily cover at a landfill. Another example is All Shredder Residue (ASR), also known as "auto fluff." This material, counted as disposed by Ecology's disposal reports, may be used as alternative daily cover depending on the landfill permit.

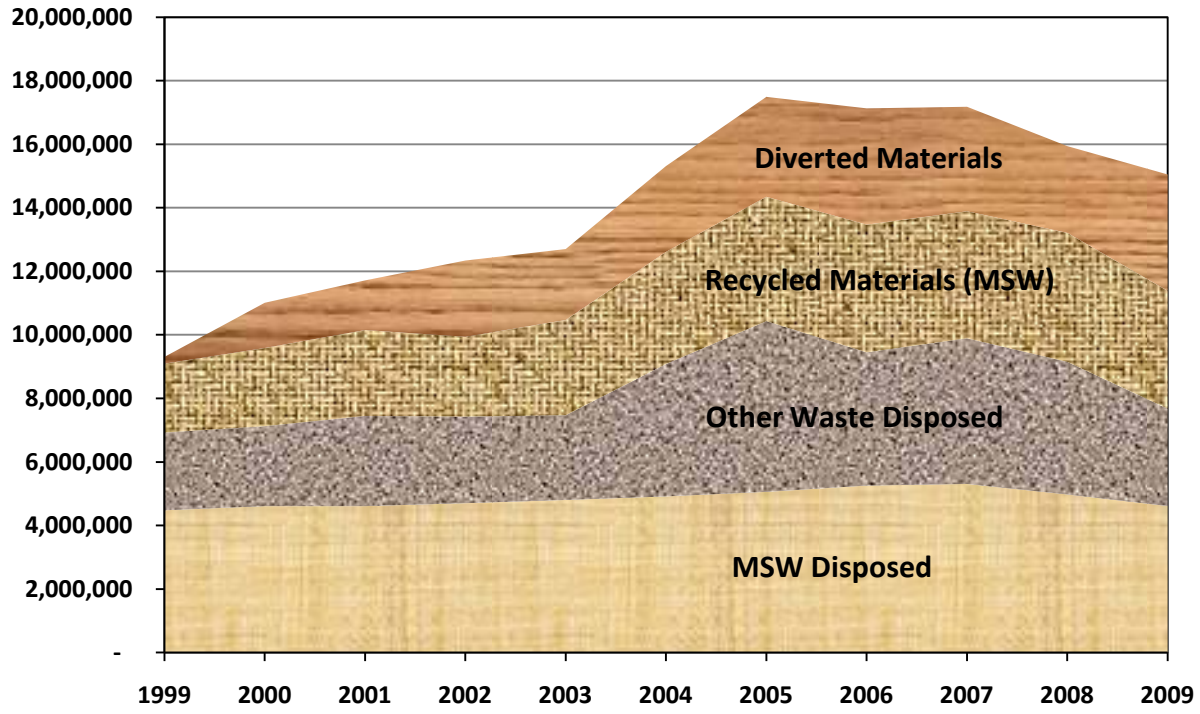
The other measured part of Washington's waste generation number is comprised of materials recycled and diverted from disposal. The reported list of materials included under recycling and diversion has increased over time. Since 1986, largely materials defined as municipal solid waste by the Environmental Protection Agency have made up the recycling number (see *Appendix B: Municipal Solid Waste Recycling* for complete details on MSW recycling).

In 1999, along with MSW recycling, sometimes referred to as "traditional" recycling, we started tracking other materials "diverted" from disposal. We now track materials reported as diverted from the waste stream but are outside the state's definition of municipal or traditional recycling. This expanded measure of recycling that we call "waste diversion" includes recyclables such as construction and demolition debris, materials burned for energy recovery and reused materials. As more types of materials are diverted from disposal, the list of items will increase.

We continue to increase our efforts to get better reporting from recyclers and those who divert waste from disposal. Due to Ecology tracking additional materials, improved tracking and reporting from recyclers, as well as actual increases in recycling and diversion, the total tonnage reported has increased over time. In 2005, the total annual waste generation in Washington reached a maximum of 17,494,320 tons, and since decreased to 15,051,853 tons in 2009.

Figure 4.3 shows the categories of solid waste tracked by Ecology under the broad categories of municipal solid waste (MSW) disposed, other waste types disposed, MSW recycled and solid waste diverted from disposal (such as recycled construction and demolition materials).

Figure 4.3
Total Solid Waste Generation in Washington (Tons)



Per Capita Waste Generation

In addition to looking at the overall picture of total waste generation, it is important to evaluate the amount of waste we produce in Washington on an individual basis or "per capita." That means the amount of waste generated by each person each day. We use the term in different ways in this report.

The recycling rate in *Appendix B: Municipal Solid Waste Recycling* looks at the portion of the waste stream termed the "municipal solid waste stream." This is waste that mainly households and commercial businesses generate. It includes such items as durable goods, nondurable goods, containers and packaging, food waste and yard trimmings. It does not include materials like industrial waste, inert debris, asbestos, biosolids, contaminated soils, or construction, demolition and land clearing debris. Materials recycled in the first category make up the "traditional" recycling rate. Materials in the second category diverted from disposal, combined with the "recycled" materials, make up the "diversion" rate.

Per capita numbers from *Appendix B: Municipal Solid Waste Recycling* for just the municipal solid waste stream are shown in Table 4.1. The per capita generation of municipal solid waste in the state in 2009 was 6.84 pounds per person per day; 3.79 pounds were disposed and 3.05 pounds were recovered for recycling. For per capita MSW numbers for 1986 – 2009, see http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

Table 4.1
Municipal Solid Waste Disposed, Recycled & Generated
(Pounds/Person per Day)

Per Capita MSW Only	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
MSW Disposed	4.29	4.23	4.27	4.32	4.37	4.43	4.52	4.48	4.14	3.79
MSW Recycled	2.29	2.48	2.28	2.69	3.14	3.43	3.46	3.38	3.38	3.05
MSW Generated	6.58	6.71	6.55	7.01	7.51	7.86	7.97	7.86	7.52	6.84

Municipal solid waste is not all of the waste produced in the state. Waste is also generated during activities such as manufacturing, construction projects, demolition and environmental cleanup.

To determine the total waste generation, we add *all* of the materials recycled, diverted and disposed. This includes not only MSW disposed, but all other waste types disposed at landfills and incinerators, as well as recycled and diverted materials. This resulted in a much higher generation number for the state - 12.37 pounds per person per day, with 6.06 pounds recycled/diverted and 6.31 pounds disposed (Table 4.2).

Table 4.2
All Solid Waste Disposed, Recycled/Diverted and Generated
(Pounds/Person per Day)

Per Capita Solid Waste	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Disposed[3]	6.63	6.83	6.74	6.71	8.07	9.14	8.12	8.36	7.64	6.31
Recycled/ Diverted	3.61	3.91	4.46	4.70	5.54	6.18	6.60	6.16	5.65	6.06
Generated	10.24	10.75	11.19	11.41	13.61	15.32	14.72	14.51	13.29	12.37

These numbers are not just waste disposed by each person from their household. These include wastes produced by business, industries and other manufacturing activities in our state. They also include wastes cleaned up from our environment, like petroleum contaminated soils from leaking gas tanks at service stations, asbestos removed from buildings that are torn down or remodeled, and contaminated soils dredged from Puget Sound. These types of wastes should be disposed in a landfill.

Much of the waste stream includes wastes that could be recycled or reused, or just not made in the first place. These are wastes we need to focus prevention and reduction efforts on as described in the state's *Beyond Waste Plan*. We want to see less waste in the categories of municipal and commercial solid waste, industrial waste, construction and demolition waste, inert waste, wood waste, other organic wastes and tires.

3 Disposed amounts include all waste generated from Washington disposed in MSW, limited purpose, and inert landfills and incinerators, both in-state and exported.

Waste Disposed by Washington "Citizens"

The amount of waste disposed each year increased until 2006. Some reasons for the decrease are probably the poor economy and slow construction activities. Waste reduction programs and availability of recycling are likely to play a part. In 2009, a total of 7,677,306 tons were disposed. Table 4.3 shows the amounts and general types of waste disposed of since 1997 by Washington citizens[4].

As part of the annual reporting requirements of *Chapter 173-351, Criteria for Municipal Solid Waste Landfills* and *Chapter 173-350 WAC, Solid Waste Handling Standards*, all landfills and energy recovery facilities report the source, types and amounts of waste received from their county, other counties, other states or other countries. We also include data from three municipal solid waste landfills in Oregon (Finley Butte, Wasco, and Columbia Ridge) that receive waste from Washington State. Spreadsheets identifying the disposal location, type and amount of waste for each county for 1994-2009 are at http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

[4] "Citizens" in this chapter does not only refer only to an individual, but includes business, industry, public and private sectors - anyone who produces waste.

Table 4.3
Waste Disposed by Washington Citizens

Waste Type	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
MSW/ Commercial	4,203,507	4,276,276	4,480,761	4,610,914	4,611,406	4,703,879	4,805,202	4,917,870	5,060,502	5,258,076	5,309,296	4,978,497	4,614,045
Demolition	462,784	529,515	530,417	685,799	759,586	835,400	650,473	884,567	1,014,526	1,127,022	1,085,977	857,135	672,067
Industrial	206,169	208,398	325,135	157,634	563,249	546,299	743,042	1,356,415	1,092,305	512,277	530,835	361,017	277,691
Inert	117,512	107,452	23,875	19,542	428,789	321,451	280,358	419,115	1,337,372	1,029,559	1,402,421	1,362,143	552,682
Wood	221,437	89,142	158,022	197,929	246,754	91,697	90,303	89,905	61,918	52,833	40,579	39,926	29,449
ASH (other than SIA)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	536,651	420,222	148,545	88,093	76,943	129,072
Sludge	72,747	65,440	62,919	95,050	1,473	1,762	22,835	10,171	12,458	33,490	30,432	35,682	16,550
Asbestos	13,130	13,044	12,961	11,777	10,929	11,177	15,455	18,252	21,951	29,700	103,686	11,914	12,654
Petroleum Contaminated Soils	474,907	198,082	372,734	284,778	616,725	784,703	568,681	489,385	957,788	740,341	735,773	1,057,069	786,762
Other Contaminated Soils	N/A	N/A	N/A	N/A	N/A	N/A	N/A	146,554	231,428	225,488	321,762	125,440	327,918
Tires[5]	2,724	12,129	10,362	40,908	7,752	4,919	22,226	15,212	22,446	33,698	50,704	25,541	28,834
Medical	7,469	7,704	5,474	6,349	5,255	2,417	2,498	2,624	2,651	2,899	3,998	3,013	2,983
Other	10,794	41,866	28,450	178,156	198,259	124,512	270,992	196,793	197,010	256,627	189,316	250,656	226,601
Total[6]	**5,793,180**	**5,549,048**	**5,537,142**	**6,288,836**	**7,450,177**	**7,428,216**	**7,472,065**	**9,083,516**	**10,432,576**	**9,450,554**	**9,892,871**	**9,184,975**	**7,677,306**

[5] In 2003 started adding tires that were reported disposed out-of-state.
[6] In 2001 started reporting waste disposed in all types of landfills and energy recovery facilities.

In 2009, there was an overall decrease in the amount of waste disposed. Most categories reported show decreases except for waste tires, ash (other than special incinerator ash) and other contaminated soils. The sluggish economy and limited building and development likely accounted for much of the reduction in waste disposed.

The types of wastes reported by landfills are very general. It is hard to know exactly what types of materials are included. For example, municipal solid waste as reported by disposal facilities would include anything a household or business throws away. We do not know exactly how much of that waste is paper, food, cans, plastics, bottles or other recyclable materials, or who actually made the waste – a household or a business.

We also do not know the specific content of wastes reported as industrial or inert. It would benefit the various waste reduction and recycling efforts for a particular type of waste or waste producer to have more details. The details can be determined through a rigorous sampling study, such as a waste characterization study.

The most recent of these studies, the *2009 Washington Statewide Waste Characterization Study*, was completed in June 2010.

Ecology commissioned Cascadia Consulting Group (Cascadia) to conduct a four-season municipal solid waste (MSW) characterization study during 2009-10. The purpose of this study was to support Ecology's *Beyond Waste* Initiative and conduct an in-depth examination of materials and resources currently disposed throughout the state.

This study included three additional tasks:

- A packaging versus product analysis which separated each of the 130 materials examined in this study -- with an emphasis on paper, plastic, glass, and metal -- into either packaging or product classes, when applicable, or one of six other material categories when packaging and product designations do not apply.

- Detailed composition results for each of the state's six waste generation areas (WGAs): Central, East, Northwest, Puget Sound, Southwest, and West.

- A supplementary analysis which combines the ten county statewide results with prior waste composition studies carried out in three additional Puget Sound Counties.

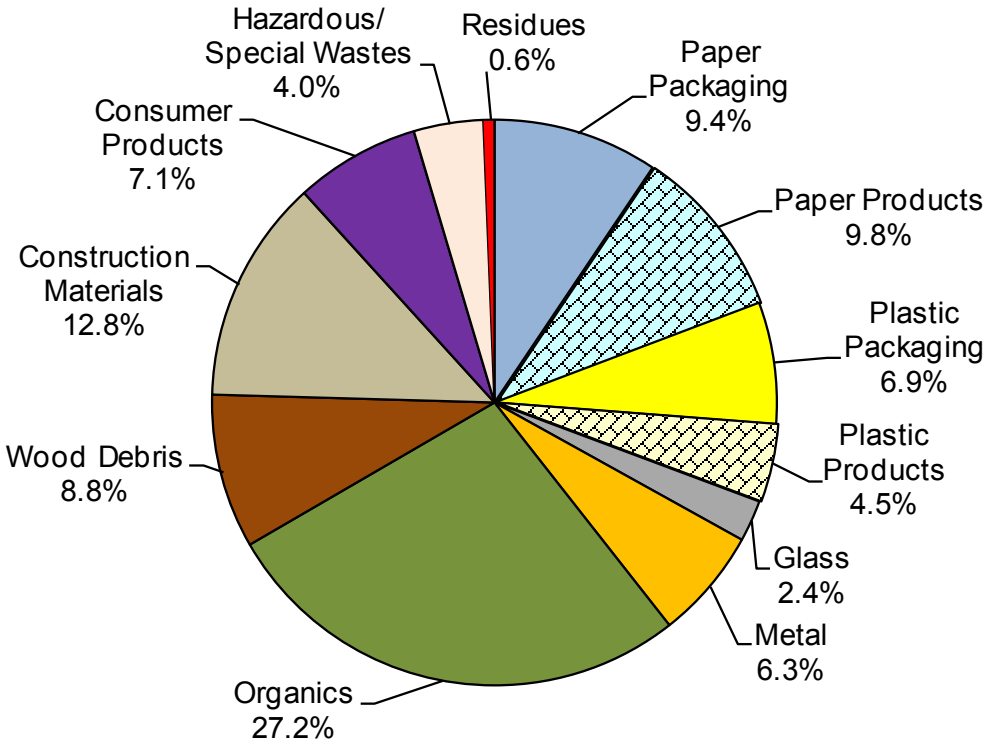
Ecology can use the data collected in this study to help municipalities, as well as public and private solid waste managers design targeted recycling and diversion programs. These programs will move beyond material disposal to resource conservation and ultimately to a healthier environment.

Figure 4.4 shows the composition estimates by Material Class for the overall waste stream. The study reveals that organic materials make up the largest percentage of the overall statewide disposed waste stream composition, at 27.2 percent. Construction materials follow, with 12.8

percent of the overall waste stream, then paper products at 9.8 percent. Food scraps make up 18.3 percent of the overall waste stream, making it the largest single material disposed in landfills.

A comprehensive analysis of the overall waste stream and the commercial, residential and self-hauled sectors, including the three additional tasks mentioned above, is addressed in the study at http://www.ecy.wa.gov/biblio/1007023.html.

Figure 4.4
Overall Statewide Disposed Waste Stream Composition by Material Class, 2009



As we move forward to implement the *Beyond Waste Plan*, specific information on the contents of our waste will be essential to understand the makeup of the solid waste stream. This will help us focus efforts to eliminate and reduce specific types of wastes or materials, and allow us to measure our progress.

Waste Recycled and Diverted from Disposal[7]

Measuring Recycling and Diversion Rates

To determine a recycling rate consistent and comparable to past years, 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 (MSW) by the Environmental Protection Agency.[8] However, since the mid-1990s, Ecology has noted very large increases of material recovery in "non-MSW" waste streams. Most notable are the growing industries in recycling asphalt, concrete, and other construction, demolition and land clearing debris. The recovery of these materials for uses other than landfill disposal is termed "diversion."

Increasingly, Washington counties and cities have put efforts into recovering and recycling these wastes that are outside the traditional MSW stream. The construction and demolition waste stream provides the best example. We are now recycling many of these materials, including asphalt, concrete, roofing material, lumber, various metals and more. Knowledge of this waste stream is increasing, although it is not easy to characterize.

Measuring diverted materials is as simple as collecting the number of tons of material diverted from landfills. In the past, many recycling survey respondents voluntarily listed this information on the recycling survey. In 1999 Ecology began asking for it more specifically.

Ecology is now calculating a "diversion" rate alongside the traditional "MSW recycling" rate. Calculating the diversion rate takes two steps. First, we measure non-MSW materials diverted from the waste stream along with recyclables that are part of MSW. Ecology then compares the resulting figure to total waste generation (minus a subset of landfilled materials that were not available for recycling or diversion).[9] Washington shows a diversion rate of 55% in 2009 (Table 4.4[10]).

Table 4.4
Diversion Rates
1999 - 2009

Year	Diversion Rate
1999	28%
2000	37%
2001	41%
2002	45%
2003	46%
2004	49%
2005	48%
2006	50%
2007	47%
2008	47%
2009	55%

[7] See *Appendix A: Municipal Solid Waste Recycling* for a complete discussion of MSW Recycling.

[8] 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.

[9] Waste types used to calculate diversion include municipal, demolition, inert, commercial, wood, tires, medical and other. Excludes industrial wastes, asbestos, sludge and contaminated soils.

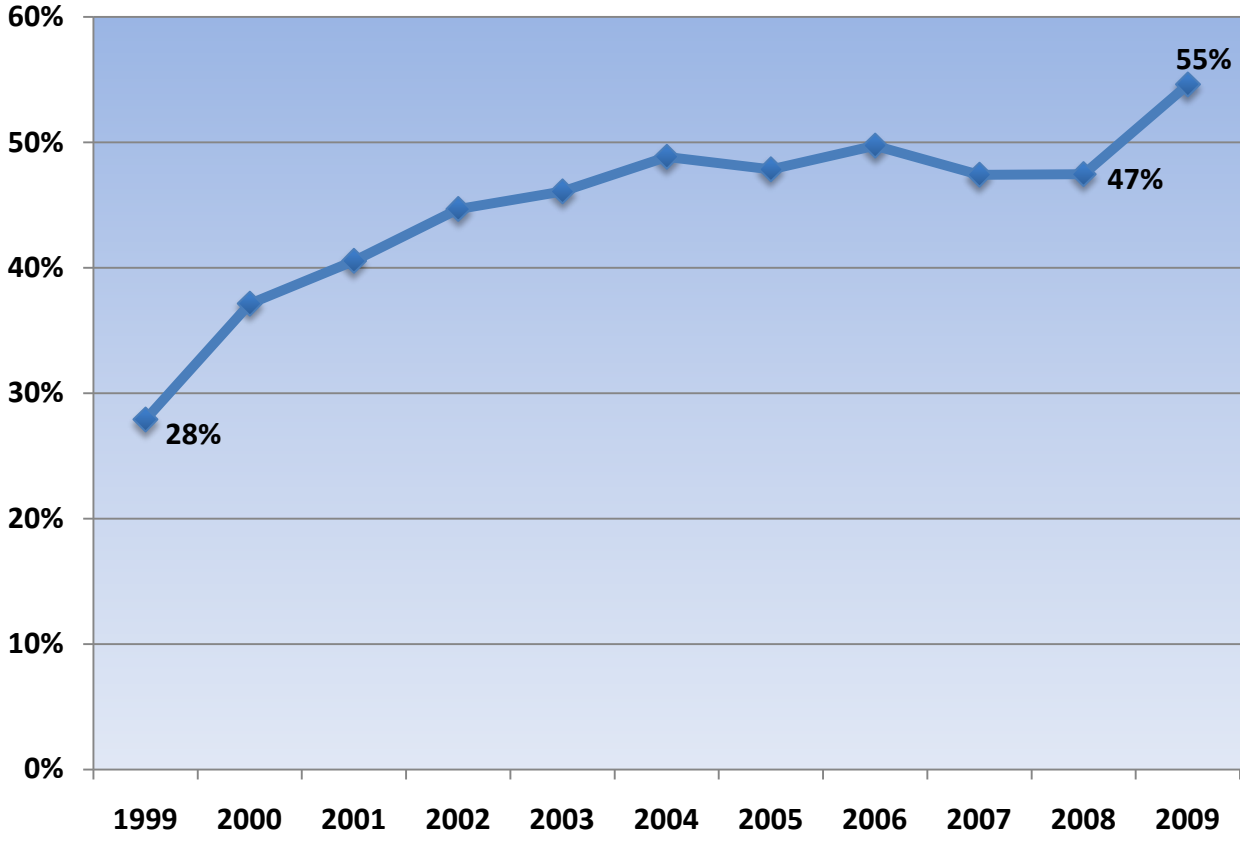
[10] Diversion rates were adjusted retroactively in 2006 to reflect the deletion of the category of topsoil (soil blends).

Wood waste makes up a large portion of the recovered materials stream in Washington. A major portion of the recovered wood is eventually burned for energy recovery. A percentage of it is also being used in new wood and paper products, as a feedstock in composting operations and as mulch. In 2002, Ecology began to gather figures on recovered wood that is burned to measure it as a diverted material. Ecology believes an undetermined amount of the wood reported as "recycled" is actually burned for energy recovery or used as "hog fuel."

In agriculture, organic waste materials are being composted and processed for land application as soil amendments. Ecology recognizes these and other uses of discarded material as potentially beneficial and includes them in the diversion numbers.

Figure 4.5 shows the diversion rate in Washington since Ecology began measuring it in 1999.

Figure 4.5
Washington State Diversion Rates – 1999 to 2009[11]



Ecology maintains that we need to study the non-MSW waste stream in more detail. We lack definite information on the total volume of waste created, especially in the industrial sector. If the facility diverting material is conditionally exempt from permitting under *Chapter 173-350 WAC, Solid Waste Handling Standards*, the reporting requirement for solid waste recyclables covers these activities.

[11] Diversion rates are adjusted retroactively each year to reflect adjustments in disposal and recycling or diversion data, and methodology for determining rates.

However, if the facility does not fall under requirements for conditional exemption from solid waste permitting, reports are voluntary, as with out-of-state facilities or haulers with no fixed facility. This makes it difficult to figure a recycling or diversion rate for many of these materials.

Measurement Methodology

The Legislature requires Ecology to measure the recycling activity in the state each year and report the results. From 1986 until 2002, tools to measure recycling activity in Washington included only the annual recycling survey. Beginning in 2003, with the reporting requirements under *Chapter 173-350 WAC*, *Solid Waste Handling Standards*, measurement tools now include annual reports for recycling facilities and intermediate solid waste handling facilities, along with the annual recycling survey.

Ecology sends the survey and annual reporting forms to recycling facilities, other firms involved in recycling (such as brokers), haulers and local governments. They reply with information about the types and quantities of recyclable materials they collected. Though the recycling survey portion of the measurement tool is mandatory, there is no penalty for not returning the information and some firms do not respond. Some firms respond with estimates of the amount and origin of materials. These factors offer challenges to compiling good county-specific recycling and diversion information.

This situation also creates the need for intensive cross-checking of data. This is done through a phone and e-mail survey of the end-users of recyclable materials, recycling facilities, other intermediate collectors of recyclables and local governments. Ecology develops aggregate figures for each commodity and compares them to the reports collected.

The recycling survey is essentially voluntary in that the solid waste rules do not include a penalty for those who do not respond. The annual reports for facilities are mandatory. Facilities could receive a penalty for failing to submit an annual report.

Ecology bases the reliability of the results on review of draft numbers sent to local governments, and comparisons to waste characterization, disposal data and commodity end-user information. Companies reporting on the recycling survey may just report tonnage they collected directly from generators. However, facilities responding to annual reports need to submit tonnage information for all materials handled at their facility. Also, county recycling coordinators and solid waste managers are asked to review the figures.

Finally, Ecology checks figures against double-counting by verifying exchange of materials between reporting entities. Companies are asked to report the destination of materials and final use on their recycling survey and annual report forms, and this data is verified by phone and e-mail to the extent possible.

Both the recycling survey forms and the annual reporting forms are available on Ecology's website. Respondents can print and complete the forms, or download, complete electronically and e-mail them to Ecology.

For the 2009 reporting year, a new solid waste facilities database was available as a central location for tracking recycling survey and annual report facilities, managing contact information, and inputting and exporting data. If possible, in the coming years Ecology would like facilities to input their own data into this database instead of sending paper copies.

Results – 2009 Diversion

When Ecology began to measure other materials along with the traditional MSW recycling, this expanded measure was termed "diversion." It continued to include the same materials used since 1986 to calculate the MSW recycling rate. These materials are part of the MSW stream, as Ecology defined it when designing the recycling survey in the mid-1980s (see *Appendix B: Municipal Solid Waste Recycling*). Table 4.5 provides tonnage figures for each material included in the diversion rate from 2006-09, including recycled MSW materials and non-MSW materials such as construction and demolition debris.

Table 4.5
Diverted & Recycled Materials Reported (Tons)[12] Diversion Rates

Diverted & Recycled Materials Reported	2006	2007	2008	2009
Agricultural Organics[13]	-	-	31,800	45,431
Aluminum Cans	14,951	14,005	12,842	21,098
Antifreeze	7,507	7,055	6,586	5,194
Ash, Sand & Dust used in Asphalt Production	4,008	2,521	-	344
Asphalt & Concrete	2,295,278	2,089,972	1,510,051	2,186,429
Carpet and Pad	897	1,193	3,297	3,317
Construction & Demolition Debris	300,820	302,089	339,066	302,836
Container Glass	90,992	96,934	94,077	100,823
Corrugated Paper	570,802	555,757	569,688	491,266
Electronics	11,386	12,325	17,265	22,190
Fats and Oils[14]	-	-	124,289	92,345
Ferrous Metals	1,048,885	1,009,826	1,013,552	889,685
Fluorescent Light Bulbs	1,063	979	1,600	1,229
Food Processing Wastes (pre-consumer)	25,369	-	3,494	14,027
Food Scraps (post-consumer)[15]	171,744	167,268	48,664	77,699
Gypsum	62,482	52,767	86,603	38,662
HDPE Plastics	8,000	11,348	7,742	13,876
High-Grade Paper	71,774	82,806	57,929	47,266
Household Batteries	1,350	1,755	2,270	535
Industrial Batteries	-	-	-	99
Industrial Organics[16]	-	-	45,586	85,692
Land Clearing Debris	258,563	168,007	169,428	162,939
Land Clearing Debris for Energy Recovery	208,010	136,205	141,406	78,018
Large Appliances	49,796	44,667	43,401	39,777
LDPE Plastics	14,928	13,695	14,040	15,407
Milk Cartons/Drink Boxes-Tetra	5,755	5,787	5,475	5,526
Miscellaneous	2	-	-	13
Mixed Paper	316,874	361,043	367,834	274,982
Newspaper	294,887	289,250	282,981	267,524

[12] Detail may not add due to rounding. See *Appendix B: Municipal Solid Waste Recycling* for a list of materials counted as MSW recycling. Data includes organic materials processed by commercial composting facilities.
[13] Prior to 2008, included in Other Organics category.
[14] Includes animal fat and used cooking oil collected for rendering or processing in commercial quantities. Prior to 2008, included in Food Scraps category.
[15] Prior to 2008, this category included fats and oils reported for recycling.
[16] Prior to 2008, included in Other Organics category, or classified as Wood Fiber/Industrial Paper.

Diverted & Recycled Materials Reported	2006	2007	2008	2009
Nonferrous Metals	135,976	115,718	94,340	251,967
Oil Filters	2,189	2,635	2,639	2,535
Other Fuels (Reuse & Energy Recovery)	1	.25	-	-
Other Organics[17]	121,454	149,492	86,191	47,430
Other Recyclable Plastics	7,776	12,350	11,245	12,524
Other Rubber Materials	39	50	6	8
Paint (Reused)	1,051	344	928	552
PET Plastics	7,558	14,024	9,827	16,767
Photographic Films	458	429	442	354
Post-Industrial & Flat Glass	5,404	1,706	-	1,750
Post-Industrial Plastics	-	-	-	223
Reuse (Clothing & Household)	804	4,346	2,678	22,001
Reuse (Construction & Demolition)	1,120	1,374	-	151
Reuse (Miscellaneous)	627	286	105	4,148
Roofing Material	9,120	10,188	10,205	10,872
Steel/Tin Cans	13,936	22,315	10,526	17,293
Textiles (Rags, Clothing, etc.)	28,724	65,286	19,946	16,445
Tires (Recycled)	23,528	27,869	40,124	35,439
Tires (Baled)[18]	-	9,660	5,912	9,672
Tires (Burned for Energy)	9,236	16,735	8,440	10,725
Tires (Retread/Reuse)	13,266	4,764	3,829	6,164
Used Oil	87,304	86,174	78,443	110,038
Used Oil for Energy Recovery	1,283	129	33	177
Vehicle Batteries	25,414	25,734	25,219	21,493
Wood Waste	289,612	228,146	381,866	200,980
Wood Waste for Energy Recovery	372,678	353,683	331,528	613,888
Yard Debris	665,902	684,181	641,130	626,729
Yard Debris for Energy Recovery	21,607	25,069	26,029	49,994
Total Diverted + Recycled Materials	**7,682,189**	**7,289,943**	**6,792,597**	**7,374,548**
Total Waste Disposed[19]	**7,760,714**	**8,082,291**	**7,516,909**	**6,126,660**
Total Waste Generated	**15,442,903**	**15,372,234**	**14,309,506**	**13,501,208**
Diversion Rate	**49.75%**	**47.42%**	**47.47%**	**54.62%**

[17] Prior to 2008, includes Agricultural Organics and Industrial Organics.
[18] Began to measure as separate category in 2006.
[19] For purposes of calculating a diversion rate, this analysis includes only the wastes that are potentially recyclable. Waste types used in this calculation include MSW, demolition, inert, wood, tires, medical waste and other unclassified wastes. It excludes industrial wastes, asbestos, sludge and contaminated soils.

Waste Diversion Benefits

Waste prevention and diversion from landfill disposal (or recycling) are potent strategies to reduce greenhouse gas emissions and conserve energy. Products that enter the waste stream have energy impacts and associated greenhouse gas (GHG) emissions at each stage of their lifecycle: extraction, manufacturing and disposal.

Decomposing waste in a landfill produces methane, a greenhouse gas more potent than carbon dioxide. Waste prevention and recycling reduce the amount of waste sent to landfills, lowering the greenhouse gases emitted during decomposition. Additionally, transporting waste to a landfill emits greenhouse gases through combustion of fossil fuels.

Fossil fuels are also required to extract and process raw materials necessary to replace those materials disposed with new products. Manufacturing products from recycled materials typically requires less energy than manufacturing from virgin materials. Waste prevention and recycling delay the need to extract some raw materials, lowering greenhouse gases emitted during extraction. Waste prevention means more efficient resource use, and making products from recycled materials requires less energy. Both lower greenhouse gases emitted during manufacturing.

As an additional benefit to climate change impacts, waste prevention and diversion can help store carbon. Carbon storage increases when fewer wood products are wasted and more are recycled. Carbon storage also increases when organic materials are composted and added to the soil.

Washington's measured diversion efforts for 2009 reduced greenhouse gas emissions by about 2.8 million tons (MTCE) or 840 pounds per person. This is similar to removing 1.9 million passenger cars from the roadway each year - almost half the passenger cars in Washington.[20]

The 7.4 million tons of material diverted from disposal in Washington in 2009 saved more than 132 trillion BTUs of energy. This is roughly equivalent to the amount of electricity used in one million homes for one year or one billion gallons of gasoline.[21]

[20] Figures derived using EPA Waste Reduction Model (WARM), http://epa.gov/climatechange/wycd/waste/calculators/Warm_home.html; EPA Emission Facts, http://www.epa.gov/otaq/climate/420f05004.htm; and Washington Department of Licensing, http://www.dol.wa.gov/about/vehvesselreports.html.

[21] Figures derived using EPA Waste Reduction Model (WARM), http://epa.gov/climatechange/wycd/waste/calculators/Warm_home.html; and U.S. Energy Information Administration, http://www.eia.doe.gov/emeu/states/_seds_updates.html.

Waste Disposed in Washington State

Another way to look at waste disposed is to include all waste that goes to landfills or incinerators in the state. This includes waste brought from out-of-state, but does not include waste sent out-of-state for disposal. With all categories included, 6,370,913 tons of waste were disposed in all types of landfills and incinerators in Washington in 2009 (Table 4.6). For total solid waste disposed from 1993 – 2009, see http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

Table 4.6
Total Amounts of Solid Waste Disposed in Washington

Disposal Method	2002	2003	2004	2005	2006	2007	2008	2009
Municipal Solid Waste Landfills	4,744,561	4,572,275	5,506,112	5,517,342	5,398,008	5,354,005	5,157,547	4,775,888
Incinerated Waste	311,474	303,978	327,837	335,533	326,584	312,006	297,832	277,101
Woodwaste Landfills[22]	33,171	34,188	*	*	*	*	*	*
Inert / Demolition Landfills	476,917	476,214	509,927	1,531,642	1,231,565	1,708,445	1,261,131	693,349
Limited Purpose Landfills	605,284	586,670	1,075,102	1,387,934	760,088	600,928	623,063	624,575
Total	**6,171,407**	**5,973,325**	**7,418,978**	**8,772,451**	**7,716,245**	**7,975,444**	**7,339,573**	**6,370,913**

Municipal Solid Waste Landfills

Amount of Waste Disposed of in Municipal Solid Waste Landfills

In 2009, 15 municipal solid waste landfills accepted waste totaling 4,775,888 tons.[23] Of the 15 landfills, 12 were publicly owned and 3 privately owned.

Five of the 15 landfills received over 100,000 tons of waste in 2009. The three largest landfills in Washington are Cedar Hills in King County (867,482 tons), LRI – 304th Street in Pierce County (1,000,857 tons), and Roosevelt Regional Landfill in Klickitat County (2,088,177 tons).

In 2009, two landfills received less than 10,000 tons, Delano Landfill in Grant County and Northside Landfill in Spokane County, compared with 12 MSW landfills in 1994. Delano Landfill only received 20 tons of municipal solid waste, closing in February 2009.

[22] The category of woodwaste landfills is no longer included under *Chapter 173-350 WAC, Solid Waste Handling Standards.*

[23] Throughout this report, different disposal amounts are discussed. These numbers vary based on the types of facilities discussed, source of the waste and 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.

Figure 4.6 shows that several smaller and a few mid-sized landfills closed between 1995 and 1996 in response to more stringent regulations for MSW landfills (*Chapter 173-351 WAC, Criteria for Municipal Solid Waste Landfills*). Other landfills are reaching their remaining capacity and not planning to expand. There has been a gradual decrease in the number of landfills since 1996. With the closure of Delano Landfill in Grant County, there are only 14 operating municipal solid waste landfills in the state.

Figure 4.6
Number of MSW Landfills
(Based on Tons Disposed)

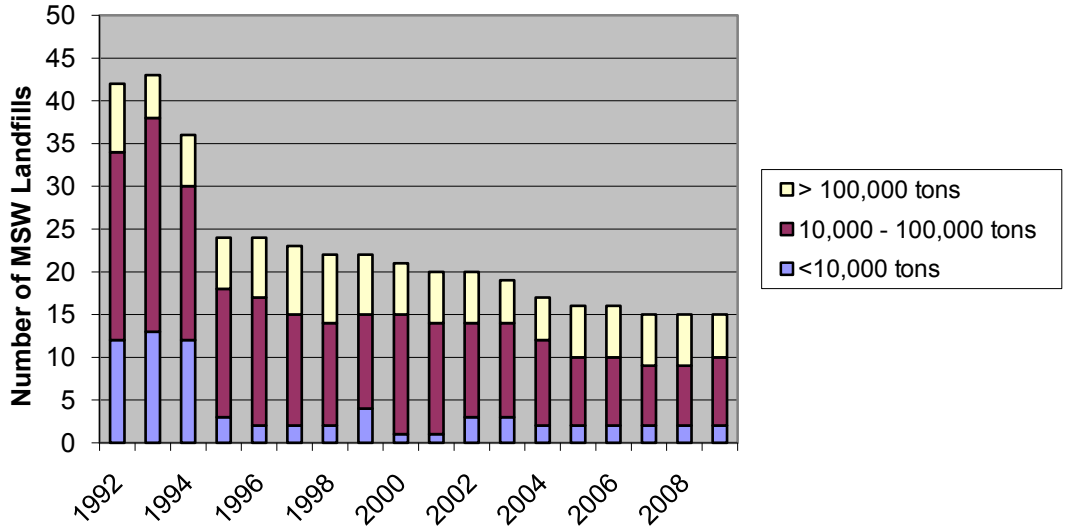


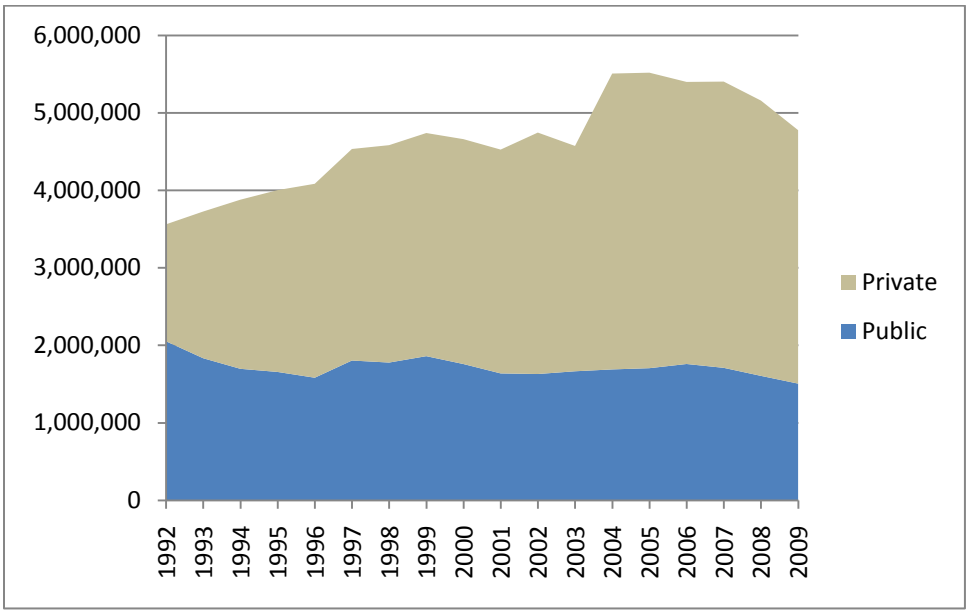
Table 4.7 shows the relationship of waste disposal to public/private ownership. As the table illustrates, 1,505,578 tons of solid waste disposed went to publicly owned facilities (32 percent), with the remaining 3,270,010 tons going to private facilities (68 percent).

Table 4.7
Waste Disposed in MSW Landfills – Public/Private

Ownership	Number of MSW Landfills		Amount of Waste Disposed (Tons)		% Total Waste Disposed	
	1991	2009	1991	2009	1991	2009
Public	36	12	2,696,885	1,505,578	69	32
Private	9	3	1,192,207	3,270,110	31	68
Total	**45**	**15**	**3,889,092**	**4,774,888**	**100**	**100**

The amount of waste disposed in MSW landfills shows movement from the publicly owned facilities to those owned by the private sector (Figure 4.7). The trend has continued since 1991, when the state first started to track this type of information. The amount of waste disposed in the private facilities has increased from 31 percent since 1991 to 68 percent in 2009. The private Roosevelt Regional Landfill in Klickitat County and LRI 304th Street Landfill in Pierce County can account for the majority of this increase.

Figure 4.7
Comparison of Waste Disposed in Public and Private MSW Landfills (Tons)



Types of Waste Disposed in Municipal Solid Waste Landfills

Traditionally, many people think of the waste going into MSW landfills as being mostly household waste.[24] Annual facility reports show a much wider variety of waste is disposed in MSW landfills. These wastes need to be considered in terms of remaining available capacity. All landfills reported disposing types of solid waste other than MSW. Demolition, industrial, inert, sludge, asbestos, tires, auto-fluff, petroleum-contaminated soils (PCS) and other contaminated soils were the major waste streams.

Most landfills report in only a few categories. This makes knowing exact amounts of specific waste types difficult. For amounts and types of waste individual MSW landfills reported in 2009, see http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

Table 4.8 shows changes in waste, types and amounts disposed in MSW landfills from 2001-09. MSW landfill data from 1992 – 2009 is available at http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

[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 4.8
Waste Types Reported Disposed in MSW Landfills (Tons)

Waste Types	2001	2002	2003	2004	2005	2006	2007	2008	2009
Municipal/Commercial[25]	3,432,359	3,440,727	3,394,428	3,598,760	3,631,873	3,787,080	3,847,352	3,637,010	3,435,505
Demolition Waste	373,254	379,405	324,069	366,087	541,945	551,572	532,409	363,343	260,500
Industrial Waste	201,198	179,058	212,918	1,034,615	624,958	182,661	131,167	130,929	115,390
Inert Waste	26,376	17,092	2,635	1,705	15,780	15,842	22,491	11,055	6,387
Commercial Waste[26]	66,391	99,048	93,036	-	-	-	-	-	-
Wood	34,254	55,149	47,622	25,576	9,896	4,462	71	18	424
Ash (other than SPI)	-	-	-	3,444	2,857	2,432	3,959	2,102	1,096
Sewage Sludge	1,473	1,762	23,435	10,172	12,476	21,303	6,703	7,892	15,732
Asbestos	5,991	4,908	9,625	12,086	7,943	5,633	5,379	4,308	4,975
Petroleum Contaminated Soils	217,721	457,061	342,172	279,982	320,283	455,964	326,019	693,719	515,567
Other Contaminated Soils	-	-	-	49,454	212,692	224,608	295,930	119,711	232,673
Tires	8,567	5,776	9,512	7,462	6,942	8,525	11,797	13,162	8,151
Special	917	567	-	-	-	-	-	-	-
Medical	387	372	2,459	2,565	2,576	2,721	2,805	2,932	2,907
Other [27]	156,131	103,636	110,364	114,204	127,121	135,206	167,933	171,366	176,581
Total	**4,525,019**	**4,744,561**	**4,572,275**	**5,506,112**	**5,577,342**	**5,398,008**	**5,354,005**	**5,157,547**	**4,775,887**

[25] Some facilities include demolition, industrial, inert, commercial and other small amounts of waste types in the MSW total. In 2004, municipal and commercial categories were combined.
[26] In 2004, the municipal and commercial categories were combined.
[27] Some of the "other" types of waste reported include auto fluff, vactor waste, WWT grit and uncontaminated soils.

Future Capacity at Municipal Solid Waste Landfills

As of September 2010, 14 MSW landfills were operating in Washington State. Ecology determined the amount of remaining capacity for them by asking them to report remaining permitted capacity, as well as the expected closure date. In 2010, the facilities estimated about 235 million tons, or about 49 years of capacity at the current disposal rate. This is a slight increase from 2009 because of a landfill expansion at Cheyne Road in Yakima County.

Changes in permit conditions, early landfill closures, projections of fewer expansions and changing volumes affect remaining capacity, which has fluctuated the past several years. Of the 14 currently operating landfills, 12 have greater than 5 years of remaining permitted capacity. Some landfills are planning expansions in the future. Table 4.9 includes an estimated number of facilities with specified remaining years of life.

Table 4.9
Estimated Years to Closure for MSW Landfills

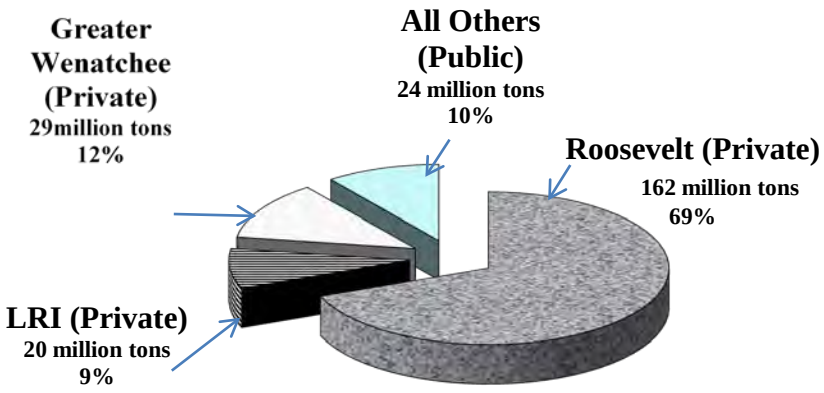
Years to Closure	% of total Remaining Capacity	Number of Facilities	Public	Private
Less than 5 years	0.2	2	2	0
5 to 10 years	2.8	1	1	0
Greater than 10 years	97	11	8	3
Totals	**100%**	**14**	**11**	**3**

Capacity numbers in 2010 indicated about 97 percent of remaining capacity was at landfills with more than 10 years before closure. Eleven of the 14 operating MSW landfills are publicly owned, with about 10 percent of the remaining capacity (24 million tons). About 90 percent of the remaining permitted capacity (211 million tons) is at the three privately owned facilities, compared to 73 percent in 1993.

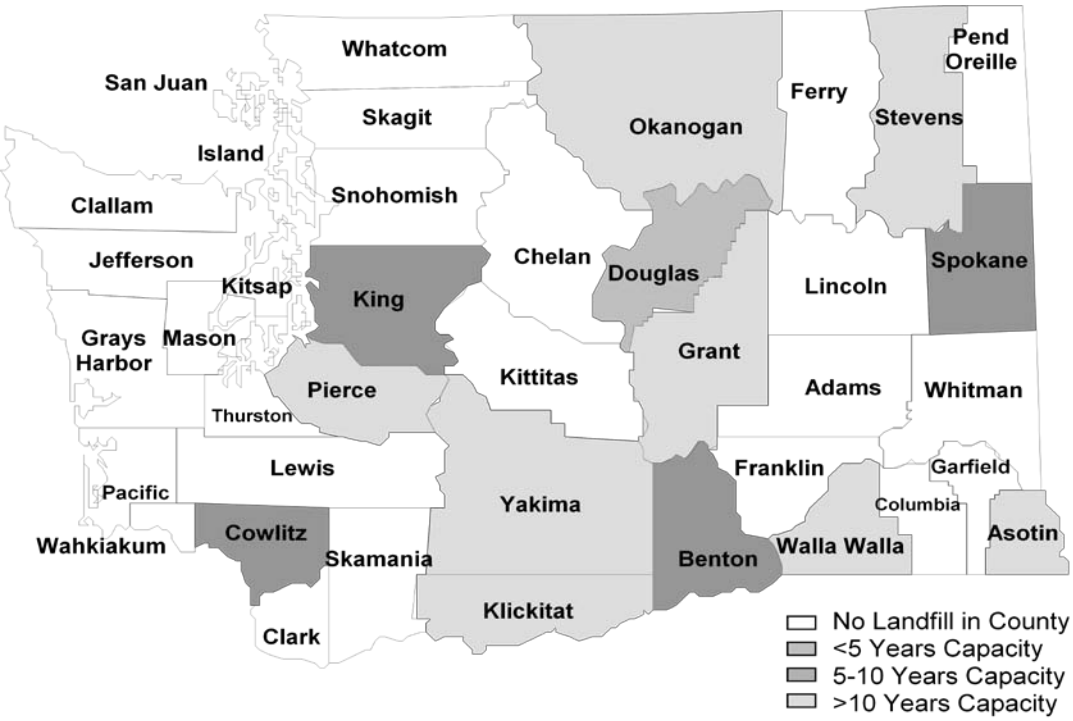
The majority of the capacity, 69 percent of the total statewide capacity, is at the privately owned Roosevelt Regional Landfill in Klickitat County. The Oregon Department of Environmental Quality was asked about the remaining capacity at the three municipal solid waste landfills that receive waste from Washington. Estimates are about 130 million tons of remaining capacity.

Two other private landfills have the next largest remaining capacity: Greater Wenatchee (12 percent) and LRI in Pierce County (9 percent). The 11 publicly owned landfills have 10 percent of the remaining statewide capacity (see Figure 4.8). Map 4.A shows the counties and the remaining years of capacity of their MSW landfills.

Figure 4.8
2009 Remaining Permitted Capacity at MSW Landfills

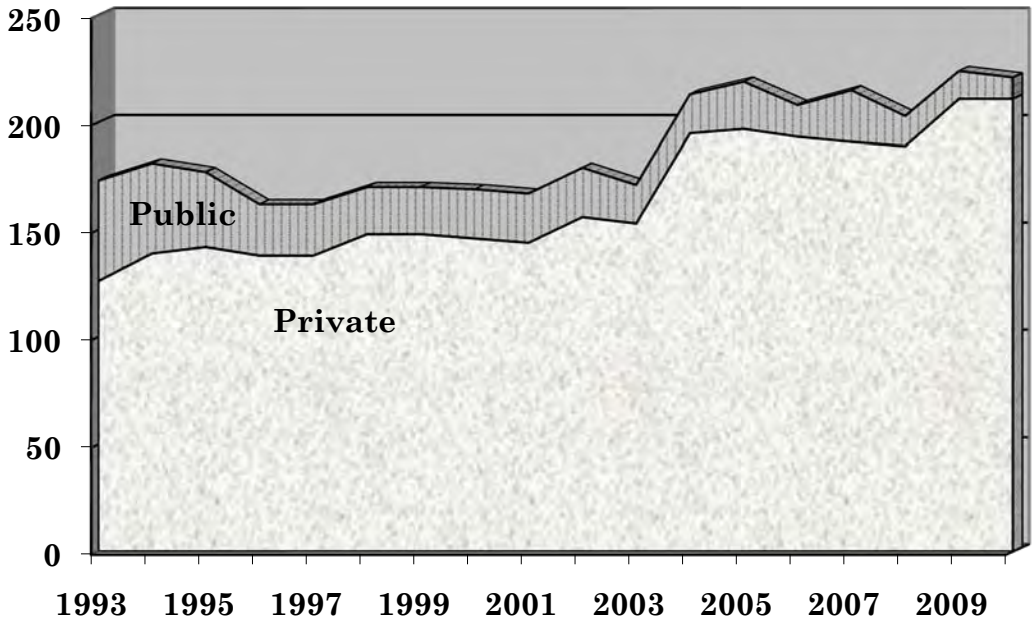


Map 4.A
Remaining Permitted MSW Landfill Capacity as of April 2010



The remaining capacity at private landfills has exceeded that for public facilities since the amounts were tracked in 1992 (Figure 4.9).

Figure 4.9
Remaining Capacity MSW Landfills
(Public/Private in Million Tons)



Besides the amount of remaining capacity, availability of that capacity needs to be considered. The Roosevelt Regional Landfill accepts waste from a wide variety of locations (see Map 4.C). In 2009, the facility received some type of solid waste from 26 counties in Washington, including the majority of the solid waste from 15 counties. They also received waste from Alaska, Oregon and British Columbia.

For other counties that do not have landfills, Roosevelt or the Oregon landfills have become the most utilized disposal option. Other landfills in the state accept the majority of waste from the county where they operate. To reserve capacity for local citizen needs, some are also using regional facilities for some of their disposal needs.

Ecology bases its 49-year estimate of total remaining permitted capacity on the amount of waste disposed in MSW landfills in 2009. This amount will vary depending on waste reduction and recycling activities, population growth or decline, and the economy. Other contributing factors include the impact of waste being imported into the state for disposal or a shift to in-state disposal of waste currently being exported. Cleanup activities, such as dredging contaminated sediments from Puget Sound, will add large volumes to the disposal totals.

Waste-to-Energy/Incineration

Three waste-to-energy facilities and incinerators statewide burned 277,101 tons of solid waste. Of that amount, 17,435 tons were wood waste at the Inland Empire Paper facility in Spokane. [28] This incinerator does not burn MSW. The Spokane Regional Waste to Energy Facility is the only incinerator that burns municipal solid waste in the state. For amounts and types of waste incinerated in 2009 see http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

MSW Landfill Disposal vs. Incineration

Table 4.10 compares the amount of solid waste disposed in MSW landfills, and waste-to-energy facilities and incinerators in 2009.

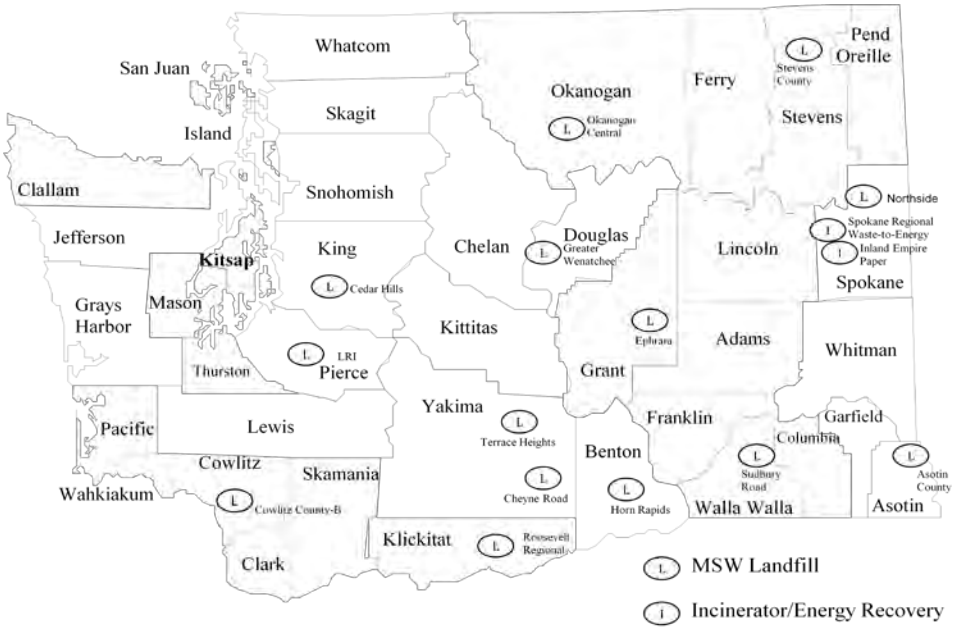
In 1991, 98 percent of waste was disposed in MSW landfills and 2 percent was incinerated. The highest percentage of incinerated waste in the state, 12 percent, occurred in 1995.

Table 4.10
Waste Disposed in MSW Landfills and Incinerators in 2009

Facility Type	Tons	Percent
MSW Landfills	4,775,888	95%
Incinerators	277,101	5%
Total	**5,052,989**	**100%**

In 2009, only about 5% of the waste stream was incinerated. The amount of waste incinerated will likely remain fairly stable, with only one operating MSW energy-recovery facility and no new facilities planned. Map 4.B shows the location of MSW landfills and energy-recovery facilities in Washington.

Map 4.B
Location of MSW Landfills & Energy Recovery Facilities as of October 2010



[28] The previously reported amounts from the Ponderay Newsprint Company in Pend Oreille County are not included because it is no longer classified as a solid waste incinerator.

Waste Disposed in Other Types of Landfills

Ash Monofill

Waste-to-energy facilities that generate more than 12 tons per day of MSW must dispose of their ash in a properly constructed ash monofill. *Chapter 173-350 WAC, Solid Waste Handling Standards*, and *Chapter 173-306 WAC*, *Special Incinerator Ash Management Standards*, now regulate these facilities. In 2009, the Spokane Waste-to-Energy Recovery facility, the only facility of this type in the state, sent 76,173 tons of special incinerator ash to the ash monofill at the Roosevelt Regional Landfill in Klickitat County.

Inert Landfills and Limited Purpose Landfills

In addition to MSW landfills, two other types of landfills currently exist in the state: inert landfills and limited purpose landfills. These are regulated under *Chapter 173-350 WAC*, Solid Waste Handling Standards, which took effect in February 2003. The former woodwaste landfill and inert/demolition landfill types no longer exist. Inert waste is narrowly defined for disposal in an *inert* landfill. Demolition waste will no longer be accepted at an inert landfill. Landfills accepting demolition or wood waste would need to be either limited purpose or MSW landfills. The limited purpose landfill permitted under the new rule has increased design and monitoring requirements.

The annual reporting forms for the inert landfills and limited purpose landfills under *Chapter 173-350 WAC* added more categories of waste. For detailed reports for the individual inert and limited purpose landfills, see http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

For a more consistent look at inert landfills over time, some waste categories were combined for Table 4.11. For inert/demolition landfill data from 1992 - 2003 and inert landfill data for 2004-09, see http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

Table 4.11
Waste Types and Amounts Disposed at Inert Landfills (in Tons)[29]

Waste Types	2002	2003	2004	2005	2006	2007	2008	2009
Demolition	243,593	95,008	28,967	39,701	89,595	89,457	-	-
Industrial	-	81,474	-	-	-	2,150	1,940	799
Inert	112,457	163,435	379,298	944,153	973,855	1,324,663	1,250,973	604,196
Wood	445	1,082	2,526	402	610	-	-	-
Asbestos	6	11	-	-	-	-	-	-
Ash (other than SPI)	-	-	-	7,989	7,497	7,052	7,680	6,320
PCS	120,159	131,872	66,260	215,286	91,399	277,812	-	-
Contaminated soils (other)	-	-	-	-	-	-	-	81,074
Tires	257	664	-	-	-	-	-	-
Other	-	2,668	33,472	324,110	68,609	7,311	538	960
Total Tons	**476,917**	**476,214**	**509,927**	**1,531,641**	**1,231,565**	**1,708,445**	**1,261,131**	**693,349**

[29] Chapter 173.350 WAC defines inert waste and limits the types of materials disposed in 'inert' landfills. These landfills were formerly permitted as inert/demolition landfills and accepted a wider variety of material. Some landfills reporting under this category are transitioning to a limited purpose permit or will be closing.

Table 4.12 shows waste types disposed in Limited Purpose Landfills. For Limited Purpose Landfill data from 1992-2009, see http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

Table 4.12
Waste Types and Amounts Disposed at
Limited Purpose Landfills (in Tons)

Waste Types	2002	2003	2004	2005	2006	2007	2008	2009
Demolition	98,827	68,946	174,519	220,076	215,543	245,604	255,098	254,824
Industrial	282,747	325,863	262,560	420,285	257,297	173,992	149,978	113,636
Inert	195,303	157,431	36,155	53,597	39,928	48,784	100,115	27,335
Wood	2,747	8,420	32266	21,494	19,629	11,702	18,210	11,608
Ash (other than SPI)	-	-	533,201	409,376	138,616	77,082	65,117	121,329
Sludge	-	-	-	-	-	460	460	460
Asbestos	1,311	1,302	1,581	1,624	1,420	1,374	1,614	2,313
PCS	9,888	4,890	20,399	224,064	32,836	20,656	11,398	75,275
Soils (uncont.)	-	-	-	13,706	29,006	-	-	-
Tires	59	81	713	690	423	65	35	122
Other	14,402	19,737	13,708	23,022	25,390	21,210	21,038	17,673
Total Tons	**605,284**	**586,670**	**1,075,102**	**1,387,934**	**760,088**	**600,928**	**623,063**	**624,575**

The woodwaste landfill category no longer exists under *Chapter 173-350 WAC, Solid Waste Handling Standards*. For woodwaste landfill data from 1992 – 2003, see http://ecy.wa.gov/programs/swfa/solidwastedata/.

Movement of Solid Waste for Disposal

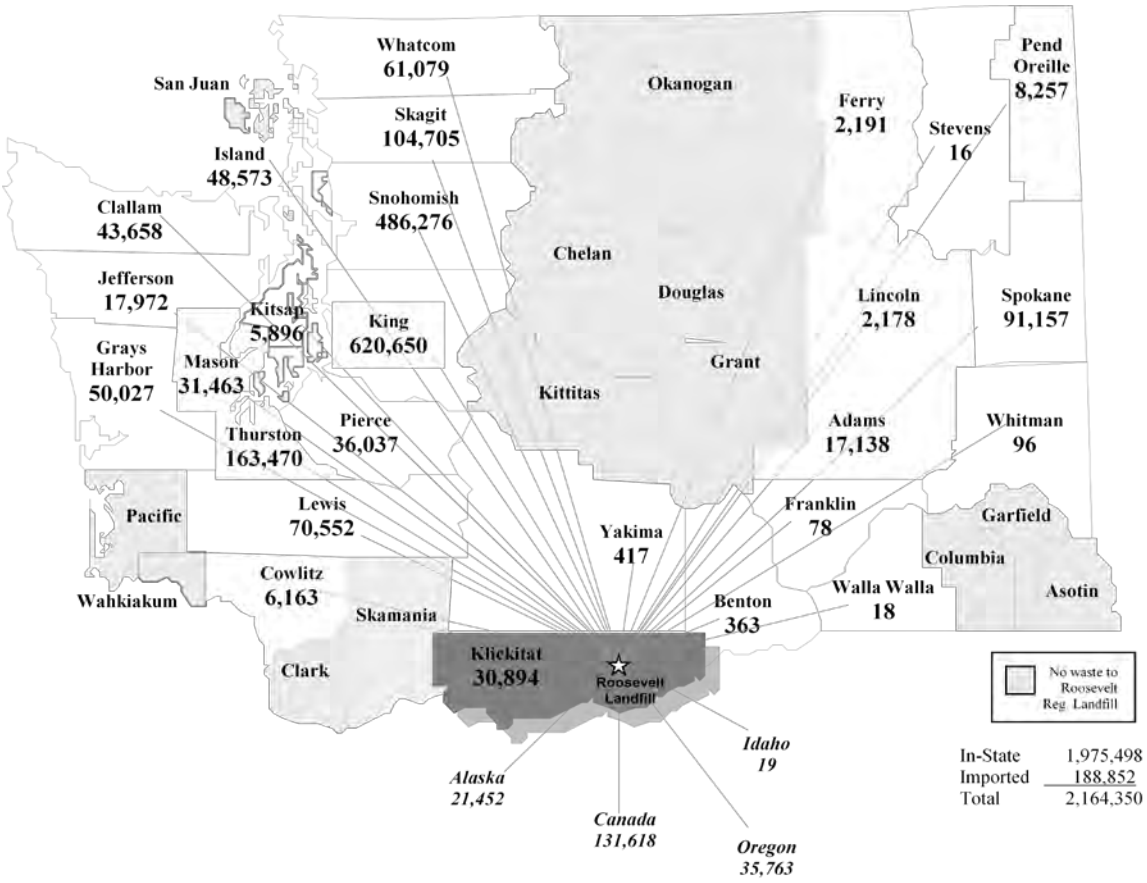
Movement of Waste Between Counties

All landfills and incinerators report the source, types and amounts of waste they receive from out of county. Eight of the 15 active MSW landfills reported receiving solid waste from other counties in 2009.

Some MSW movement was because of closer proximity to a neighboring county's landfill. This was especially true for smaller landfills that received MSW from other counties without their own landfills. Some of the waste from other counties was non-municipal waste such as PCS, demolition debris and asbestos.

With closure of many local landfills, Roosevelt Regional Landfill in Klickitat County and Oregon's regional landfills have become the chosen disposal options. The Roosevelt Regional Landfill received some type of solid waste from 26 of the 39 Washington counties and also from out-of-state and out-of-country (Map 4.C).

Map 4.C
2009 Solid Waste to Roosevelt Regional Landfill (in Tons)



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. Fifteen of the 26 counties rely on Roosevelt for the majority of their MSW disposal.

Eleven counties and the city of Seattle send the majority of their MSW to Oregon facilities. Two other counties send a significant amount of waste to Oregon. Much of the waste that goes to the Columbia Ridge Landfill in Oregon is waste other than MSW.

You can find spreadsheets that identify the disposal location, type and amount of waste for each county for 2009 (and previous years) at http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

Waste Imported from Outside the State

Landfills and incinerators also report the source, types and amounts of waste received from out-of-state or out-of-country. In 2009, a total of 319,522 tons of solid waste, about 3 percent of the waste disposed and incinerated in Washington, were imported from outside the state's boundaries for disposal at MSW landfills and energy recovery facilities. The amount of waste imported for disposal decreased from a high of 6 percent in 1996. The termination of a contract between Roosevelt Regional Landfill and a California entity accounted for much of the drop in imported waste.

Table 4.13 shows types of waste received from out-of-state for disposal. The majority of this waste (188,854 tons) went to Roosevelt Regional Landfill. Of that, 131,619 tons came from British Columbia, with the remainder from Alaska (21,452 tons) and Oregon (35,764 tons).

Table 4.13
Out-of-State Waste Disposed in Washington

Type of Waste	2003	2004	2005	2006	2007	2008	2009
Municipal Solid Waste	77,803	144,396	147,746	166,634	195,056	183,488	210,082
Demolition	3,824	3,477	2,962	3,212	4,964	3,848	5,846
Industrial	30,584	41,171	55,085	44,725	41,600	28,601	3,386
Inert	-	59	269	65	8	59	90,020
Woodwaste	28	1	-	-	30	5,413	11
Ash (other than SIA)	-	-	-	-	-	-	1,271
Sludge	621	-	19	10,883	-	-	-
Asbestos	1,245	304	831	283	354	262	175
Petroleum Contaminated Soils	3,114	7,957	4,801	3,650	4,954	3,804	3,605
Tires	5,157	4,694	1,813	3,054	3,773	5,458	4,382
Medical	-	-	-	-	-	-	-
Other	508	728	1,332	1,585	1,982	1,055	744
Total	**122,884**	**202,787**	**214,858**	**234,091**	**252,720**	**231,988**	**319,522**

Nez Perce County, Idaho disposed of 27,881 tons of MSW in Washington's Asotin County Landfill. Asotin County and Nez Perce County prepared a joint local comprehensive solid waste management plan to meet the requirements of Washington State statute. They have an agreement for joint use of the landfill.

Graham Road Recycling and Disposal in Spokane County received 6,029 tons and the Weyerhaeuser limited purpose landfill in Cowlitz County received 4,632 tons. See http://www.ecy.wa.gov/programs/swfa.solidwastedata/ for imported totals for 1991 – 2009.

Waste Exported from the State

Another aspect of solid waste movement is the amount exported from Washington to another state for disposal. In 2009, a total of 1,600,073 tons of waste created in Washington were disposed of in Oregon landfills, an increase from 705,608 tons in 1992. An additional 24,943 tons of tires were exported to other states for disposal. Table 4.14 compares the waste amounts and types exported and imported. See http://www.ecy.wa.gov/programs/swfa.solidwastedata/ for exported totals for 1993 - 2009.

Table 4.14
Comparison of Imported to Exported
Waste for all Solid Waste Facilities

Type of Waste	Imported		Exported	
	1991	2009	1993	2009
Municipal Solid Waste	24,475	210,082	710,515	1,128,259
Demolition	1,412	5,846	2,245	162,588
Industrial	-	3,386	864	51,961
Inert	208	90,020	-	4,784
Woodwaste	36	11	-	-
Ash (other than SIA)	-	1,271	-	1,598
Sludge	-	-	-	359
Asbestos	-	175	1,623	5,541
Petroleum Contaminated Soils	-	3,605	22,308	199,525
Other Contaminated Soils	-	-	-	14,170
Tires	-	4,382	-	24,943
Medical Waste	-	-	-	57
Other	-	744	18,512	32,131
Total	**26,131**	**319,522**	**756,067**	**1,625,916**

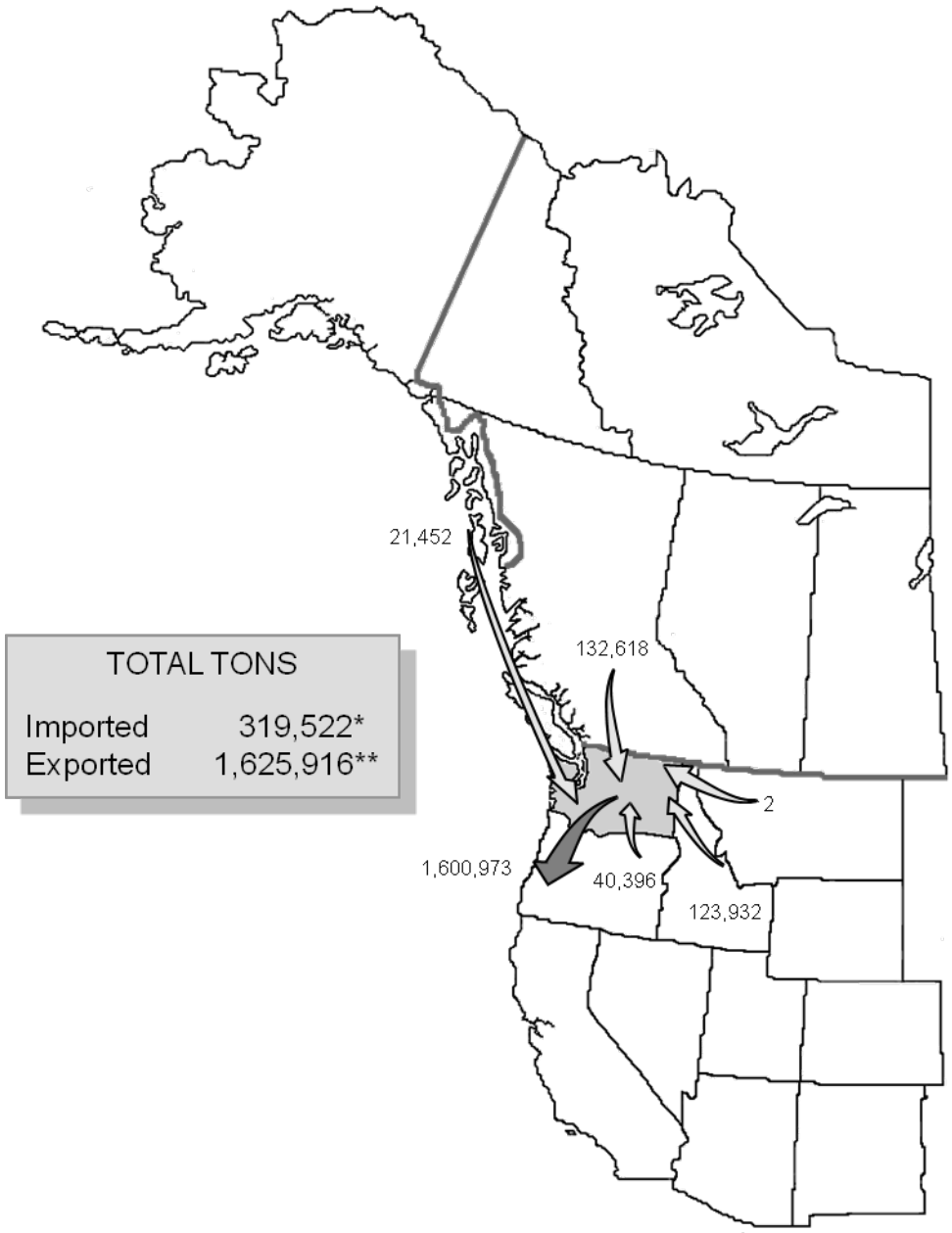
Major exporters of MSW in Washington included the city of Seattle; Benton, Columbia, Clark, Franklin, Kitsap, Pacific, San Juan, Skamania and Whitman counties; along with portions of Walla Walla and Whatcom counties. Reasons to export out-of-state have to do with closure of local landfills and negotiation 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 California.

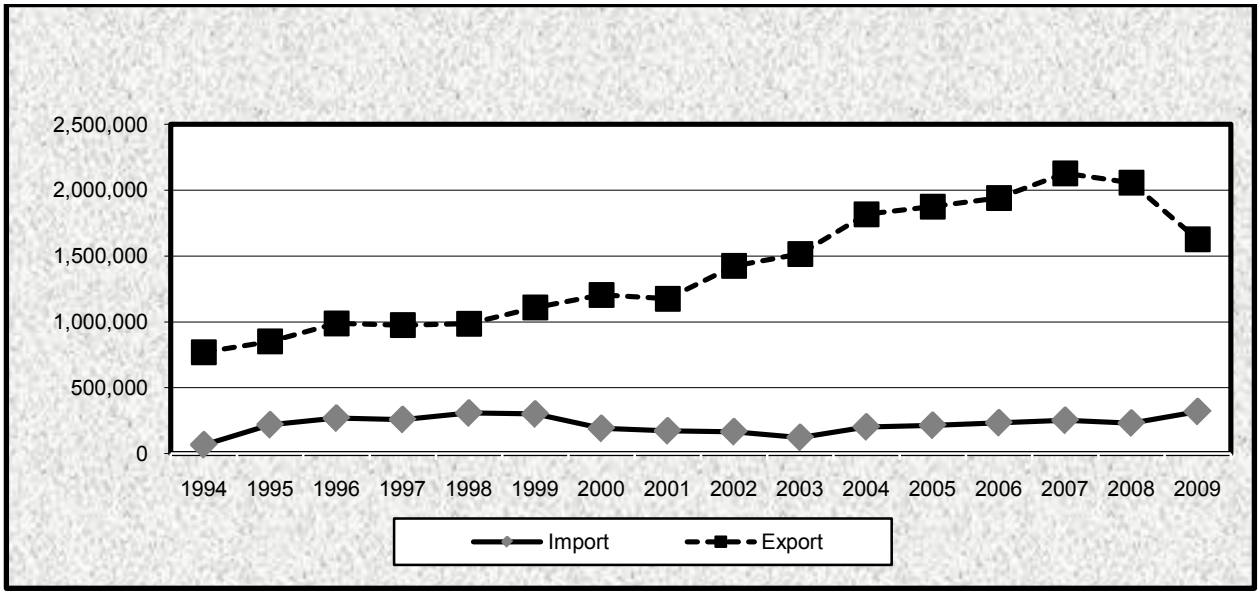
Map 4.D identifies the sources and amounts of waste that were imported and exported in 2009.

Map 4.D
Imported and Exported Waste (2009)



As shown in Figure 4.10, Washington exports have been much higher than imports since 1991. In 2009, about five times as much waste was exported to Oregon's landfills (Columbia Ridge, Wasco and Finley Buttes) as was imported to Washington for incineration or disposal.

Figure 4.10
Trend of Imported/Exported Solid Waste



Chapter 5: Moderate Risk Waste Management

The term "moderate risk waste" (MRW) was created by revisions to Washington State's 1986 Hazardous Waste Management Act (RCW 70.105). MRW is a combination of household hazardous waste (HHW) and conditionally exempt small quantity generator (CESQG) waste. HHW is waste created in the home, while CESQG is small quantities of business or non-household waste. Both HHW and CESQG waste are exempt from state hazardous waste regulations.

- Total MRW collected in 2009 was just more than 29.2 million pounds.
- The average amount of HHW disposed of per participant was 68.4 pounds, and per capita was 2.21 pounds.
- More than 3.2 percent of Washington residents used a fixed facility or collection event to remove hazardous waste from their households, about 8.3 percent of all households.
- Counties that publicly collected the most CESQG waste per capita were Lewis, Yakima, San Juan, Whatcom and Kitsap.
- Counties that collected the most used oil per capita were Garfield, Stevens, Skamania, Pend Oreille, Wahkiakum and Cowlitz.
- The ten categories of collected waste that increased the most from 2008 were Mercury Devices (manometers & barometers), Mercury Switches & Relays, Oil Filters, Oil-Based Paint (contaminated), Oil with Chlorides, Mercury (elemental), Non-Regulated Liquids, Nitrate Fertilizers, Chlorinated Solvents and Oil with PCBs.
- Approximately 82 percent of all MRW was recycled, reused or used for energy recovery.

MRW collections started in the early 1980s primarily as HHW-only events, also known as "roundups" or collection events. These events usually happened once or twice a year.

In the late 1980s, permanent collection facilities now known as fixed facilities began to replace collection events to fulfill the need for year-round collection. In addition, collection facilities have further developed with mobile units and satellite facilities. These efforts resulted in a larger number of customers served, decreased costs and increased reuse and recycling of MRW.

Please note the data in this chapter is only a portion of the MRW waste stream. The MRW data presented here is reported through local governments, with a few private companies also reporting because they have a solid waste permit issued by the appropriate local authority. Chapter 4 includes additional statewide data.

Funding

RCW 70.105.235 authorizes Ecology to provide financial assistance through grants to locals for preparing, updating and implementing local Hazardous Waste Plans, which detail local MRW programs. Ecology uses the Coordinated Prevention Grants program (CPG) to provide pass-through funding to local governments for these purposes. CPG is historically funded by the Local Toxics Control Account (LTCA).[1] However, the 2009-11 funding comes from the State Building and Construction Account (SBCA). LTCA funds were transferred to the General Fund to help balance the state budget. SBCA is funded through bonds that are sold by the state treasurer.

All local governments in the state of Washington have completed Hazardous Waste (HW) Plans. See Chapter 2 for the status of plans in each county. Every local HW plan must address:

- ✓ HHW collection.
- ✓ Household and public education.
- ✓ Small business technical assistance.
- ✓ Small business collection assistance.
- ✓ Enforcement.
- ✓ Used oil collection and education.

Accuracy of Data Collection

Ecology created and circulates a standard reporting form to all MRW programs. Nonetheless, the reported data can vary depending on a program's collection process, and how data is reported and interpreted. All programs must provide individual MRW reports.

2009 Data

Chapter 173-350 WAC, Solid Waste Handling Standards, requires local programs to submit MRW report forms annually. Annual reports are required to be submitted by April 1 for the previous calendar year collections. Information received from local programs through MRW annual reports provides Ecology with data on MRW infrastructure, collection trends, costs and waste types received at collection events and fixed facilities. Ecology translates this data into the information contained in this chapter and designs it to be specifically useful to those who operate or work in MRW programs in Washington State.

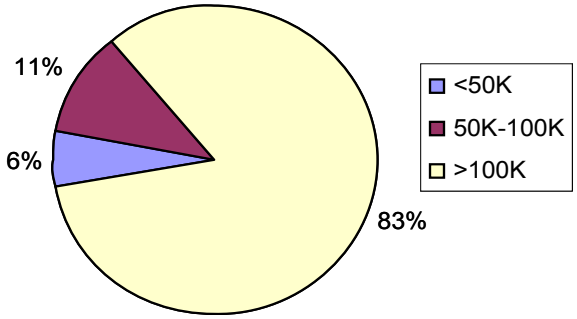
This year's report focuses on 2009 data with some comparisons to data published in previous years' reports. In an effort to provide useful information for individual programs, it was decided to present data in categories by county size.

In 2009, Columbia County did not report any HHW or used oil collections. Also, Franklin and Mason Counties failed to provide used oil reports for 2009. Private collectors provided the

[1] Authorized by RCW 82.21.030 (Chapter 82.21 RCW, Hazardous substance tax -- Model toxics control act).

numbers shown in this report for Columbia County. Figure 5.1 indicates a distinction between counties with a population of less than 50,000, 50,000 to 100,000, and more than 100,000.

Figure 5.1
Percent of State Population by County Size



Permanent fixed facilities now service most of the state. In 2009, Chelan, Douglas, Ferry, Garfield, San Juan, Skamania and Wahkiakum counties did not have fixed facilities. Garfield residents use the facility in Asotin County and Cowlitz County conducts a mobile unit in Wahkiakum County. Chelan, Douglas, Ferry, San Juan and Skamania counties conduct collection events. In past reports Ferry County was shown to have a fixed facility, but the facility is more properly categorized as a limited MRW Facility. There is a new fixed facility at the Washougal Transfer Station in Clark County. Additionally, the West Vancouver Material Recovery Facility in Clark County replaced its MRW Facility.

New MRW Facility at the Washougal Transfer Station in Clark County

Collection services for CESQGs have leveled off statewide. For 2009, 18 fixed facilities serviced CESQGs and 6 different counties provided collection events for CESQGs.

Table 5.1 shows the size of individual counties. In Washington State there are 42 programs that manage MRW. These programs include all 39 counties.

Table 5.1
Individual County Population by Size (2009)

<50K	
Adams	18,000
Asotin	21,500
Columbia	4,100
Douglas	37,600
Ferry	7,800
Garfield	2,250
Jefferson	29,000
Kittitas	39,900
Klickitat	20,200
Lincoln	10,450
Okanogan	40,500
Pacific	21,800
Pend Oreille	12,900
San Juan	16,300
Skamania	10,800
Stevens	44,000
Wahkiakum	4,100
Whitman	43,300
<50K Total	**384,500**

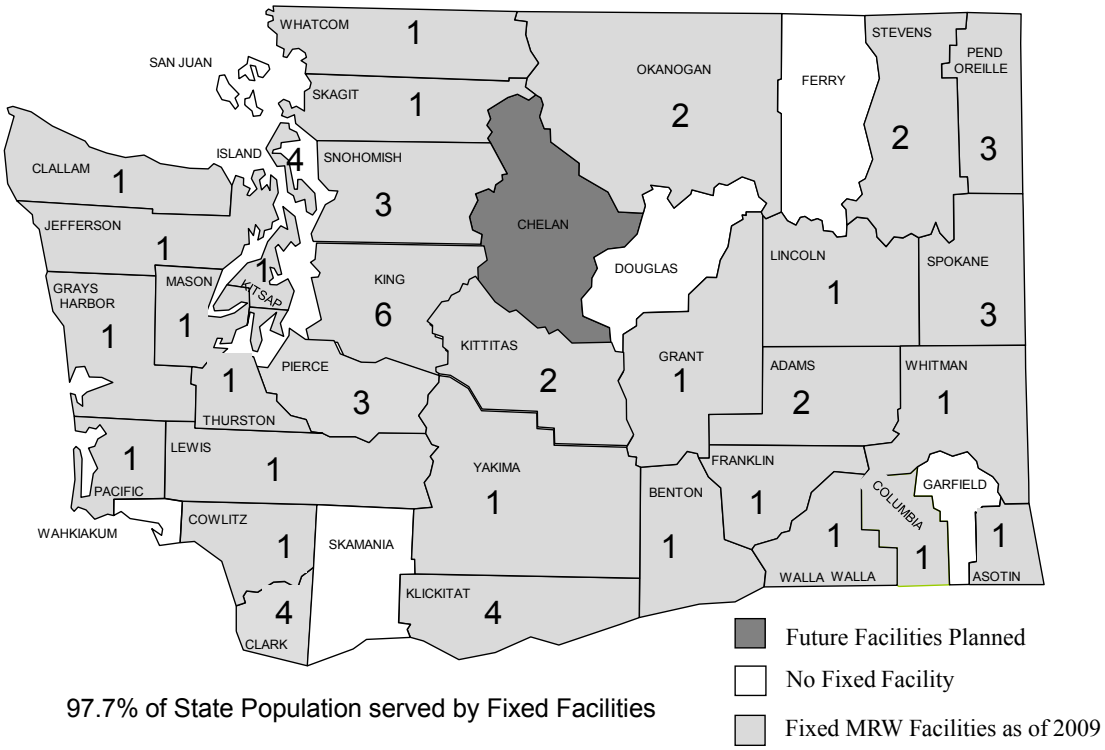
50K-100K	
Chelan	72,100
Clallam	69,500
Cowlitz	99,600
Franklin	72,700
Grant	86,100
Grays Harbor	71,200
Island	80,300
Lewis	75,200
Mason	56,800
Walla Walla	59,200
50K-100K Total	**743,200**

>100K	
Benton	169,300
Clark	431,200
King	1,909,300
Kitsap	247,600
Pierce	813,600
Skagit	118,900
Snohomish	704,300
Spokane	465,000
Thurston	249,800
Whatcom	193,100
Yakima	238,400
>100K Total	**5,540,500**

State Total: 6,668,200

Map 5.A shows which counties have permanent facilities, the number of facilities in each county and which counties are likely to develop a permanent facility in the future.

Map 5.A
58 MRW Facilities as of 2009



MRW Collected

As shown in Table 5.2, Washington programs collected approximately14.7 million pounds of HHW, 8.9 million pounds of used oil (UO) and 5.6 million pounds of CESQG waste, for a total of 29.2 million pounds of MRW during 2009. The most significant trends seen since 2004 are the increase of CESQG waste collected, and decrease in HHW and used oil collected.

HHW increased slightly by approximately 600,000 pounds in 2009. For the first time since 2004 used oil collections showed a slight increase of approximately 300,000 pounds in 2009. CESQG decreased significantly by approximately 2.7 million pounds in 2009. This decrease can mostly be attributed to Emerald Services Inc. collection of antifreeze, which decreased by approximately 2.9 million pounds in 2009 due to economic conditions.

Table 5.2
Total Pounds per Waste Category
Years 1999 – 2009

Collection Year	HHW lbs (no UO)	Used Oil lbs	CESQG lbs	Total MRW lbs
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
2002	13.5M	9.2M	1.4M	24.1M
2003	16.0M	11.7M	1.3M	29.0M
2004	15.3M	12.4M	2.4M	30.1M
2005	14.7M	11.3M	6.3M	32.3M
2006	15.2M	10.0M	7.1M	32.3M
2007	14.9M	9.7M	7.6M	32.2M
2008	14,163,842	8,606,794	8,336,030	31,106,666
2009	14,704,355	8,925,818	5,637,850	29,268,023

Collection by Waste Category and Type

There are a few factors that affected collection totals for 2009. Two large programs discontinued collection of latex paint in 2009. This resulted in approximately 850,000 pounds of latex paint not getting collected in 2009 compared to 2008.

Private collection of antifreeze from CESQG's declined by almost 3 million pounds while public collection of antifreeze from households increased by approximately 1.6 million pounds.

The E-Cycle Washington Program, an Extended Producer Responsibility (EPR) program to collect and recycle covered electronic products came online in 2009. This resulted in a reduction of approximately 1.3 million pounds of electronics collected by MRW programs.

Oil filters collected from households increased by approximately 1.2 million pounds. Modest fluctuations in other categories make up the rest of the difference to arrive at approximately 2 million less pounds of MRW collected in 2009 compared to 2008.

As shown in Table 5.3, the most dominant waste types of MRW collected in 2009 were noncontaminated used oil, antifreeze, oil-based paint, latex paint, lead-acid batteries and flammable liquids. These totals include used oil and antifreeze collected at all collection sites. These six specific waste types accounted for approximately 76 percent of the estimated 29.2 million pounds of MRW collected in 2009.

Table 5.3
Six Most Dominant MRW Waste Types Collected in 2009

Waste Type	Total Lbs.
Non-Contaminated Used Oil	8,848,250
Antifreeze	4,840,774
Oil-based Paint	2,971,100
Latex Paint	2,019,710
Lead-Acid Batteries	1,809,711
Flammable Liquids	1,742,614
Total	**22,232,159**

Table 5.4 provides summary information on total pounds of MRW collected from HHW and CESQG (publicly and privately collected) categories by waste types. Some waste type categories were changed and a few new ones added to the annual report form beginning in 2007.

Table 5.4
Total Pounds of MRW Collected by Waste Category in 2009

Waste Type	HHW	CESQG	Total
Acids	109,511	28,894	138,405
Acids (Aerosol Cans)	0	921	921
Aerosols (Consumer Commodities)	155,866	14,690	170,556
Antifreeze	2,297,260	2,543,514	4,840,774
Bases	136,510	39,058	175,568
Bases, Aerosols	274	452	726
Batteries (Lead Acid)	1,773,191	36,520	1,809,711
Batteries (Small Lead Acid)	10,118	5,418	15,536
Batteries (Dry Cell)	204,721	17,007	221,728
Batteries (Nicad/NIMH/Lithium)	28,644	7,888	36,532
CFCs	2,021	0	2,021
Chlorinated Solvents	5,380	3,841	9,221
CRT's	215,490	12,668	228,158
Electronics	472,278	1,620	473,898
Flammable Solids	12,159	35,301	47,460
Flammable Liquids	1,036,124	706,490	1,742,614
Flammable Liquids, Aerosols	3,693	0	3,693

Waste Type	HHW	CESQG	Total
Flammable Liquids Poison	172,146	18,207	190,353
Flammable Liquid Poison, Aerosols	11,211	45	11,256
Flammable Gas (Butane/Propane)	66,705	2,096	68,801
Flammable Gas Poison	6,423	286	6,709
Flammable Gas Poison, Aerosols	30,023	1,256	31,279
Latex Paint	1,921,758	97,952	2,019,710
Latex Paint, Contaminated	978,855	67,116	1,045,971
Mercury Compounds (Dental Amalgam)	63	7,248	7,311
Mercury Devices (Monometers, Barometers, etc.)	844	1,208	2,052
Mercury (Fluorescent Lamps & CFLs)	264,715	110,375	375,090
Mercury (Pure Elemental)	1,101	296	1,397
Mercury (Switches & Relays)	101	15	116
Mercury (Thermostats/Thermometers)	474	550	1,024
Nitrate Fertilizer	3,523	0	3,523
Non-Regulated Liquids	126,591	1,021,107	1,147,698
Oil-Based Paint	2,665,975	305,125	2,971,100
Oil-Based Paint, Contaminated	4,449	49,960	54,409
Oil Contaminated	51,518	26,050	77,568
Oil Filters	1,454,698	2,887	1,457,585
Oil Filters Crushed	18,077	0	18,077
Oil Non-Contaminated	8,773,022	75,228	8,848,250
Oil with Chlorides	2,154	503	2,657
Oil with PCBs	19,367	12,787	32,154
Other Dangerous Waste	33,990	440,229	474,219
Organic Peroxides	1,326	116	1,442
Oxidizers	29,120	4,605	33,725
Pesticide/Poison Liquid	252,631	18,564	271,195
Pesticide/Poison Solid	172,857	13,222	186,079
Photo/Silver Fixer	80	7,771	7,851
Reactives	1,858	42	1,900
MRW TOTAL	**23,528,895**	**5,739,128**	**29,268,023**

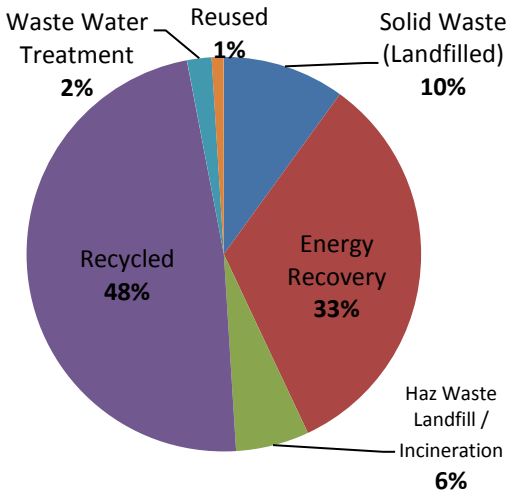
* These totals do not match the HHW and CESQG totals in Table 5.2 because these contain used oil, which was separated out in Table 5.2. Also, in past reports most of the used oil was included with the CESQG totals. It is impossible to know if used oil collected at facilities such as Jiffy Lube is HHW or CESQG. However, it seems more reasonable in that most of it is HHW rather than CESQG. Therefore, since 2008 it is now included with the HHW total in Table 5.4 instead of the CESQG total as in the

past. Note: In 2009 MRW facilities recycled 507,956 pounds of materials such as propane tanks, cardboard, cans, etc. This number is not included in any of the data in the above table or elsewhere in this Chapter. It is noted here because it is a waste stream that MRW facilities must deal with. The majority of MRW facilities manage these recyclables appropriately.

Disposition of MRW Waste

The disposition of MRW collected is generally well managed. Most MRW is recycled or used for energy recovery. Very little of the MRW collected is safe for solid waste disposal. Six percent of all MRW is disposed at a hazardous waste landfill or incinerator. Figure 5.2 shows final disposition of MRW between recycled, reused, energy recovery, hazardous waste landfill or incineration, solid waste landfill and disposal through a wastewater treatment plant.

Figure 5.2
MRW Final Disposition



MRW Data

Table 5.5 shows various data by county. This data includes privately collected CESGQ wastes by Emerald Services and Phillip Services Corporation. The included private collection data was first presented this way in 2008 with previous reports including this data for Pierce and King counties only. This information can be used to evaluate efficiencies within each county by comparing percentage of participants per housing units and costs, and HHW pounds per participant. Housing units are the number of households in each county. This data is used instead of per capita because participants typically represent a household.

Table 5.5
Various HHW Data by County

County	Housing Units	HHW Participants	% Participant / Housing Units	HHW Cost / Participant	HHW lbs / Participant	HHW Total lbs	HHW, SQG, & Used Oil Total lbs
Adams	6,420	180	2.8%	$29.05	31.43	5,657	30,256
Asotin	9,922	1,255	12.7%	$86.94	54.19	68,008	110,875
Benton	66,602	5,298	8.0%	$46.48	49.51	262,295	450,127
Chelan	34,562	732	2.1%	$118.09	113.87	83,355	197,256
Clallam	35,341	546	1.5%	$183.28	150.20	82,011	257,808
Clark	168,118	9,673	5.8%	$54.60	153.38	1,483,661	1,920,609
Columbia	2,183	0	0%	$0	0	No HHW Collection #'s in 2009	1,773*
Cowlitz	43,190	1,645	3.8%	$62.77	213.73	351,594	677,089
Douglas	15,544	664	4.3%	$68.04	91.60	60,820	105,959
Ferry	4,168	24	.6%	$32.18	23.67	568	4,798
Franklin	23,544	297	1.3%	$32.50	39.21	11,646	316,907
Garfield	1,326	Inc. w/ Asotin	Inc. w/ Asotin	Inc. w/ Asotin	Inc. w/ Asotin	Inc. w/ Asotin	18,195
Grant	34,625	684	2.0%	$101.82	91.06	62,283	126,626
Grays Harbor	35,734	1,783	5.0%	$74.41	61.48	109,620	386,144
Island	38,822	2,698	7.0%	$64.97	78.45	211,665	398,207
Jefferson	16,649	1,447	8.7%	$97.15	53.75	77,774	163,197
King	832,337	64,037	7.7%	$51.17	44.84	2,871,576	6,438,039
Kitsap	105,227	7,724	7.3%	$101.12	124.85	964,339	1,640,260
Kittitas	20,010	499	2.5%	$180.81	222.70	111,128	212,618
Klickitat	10,091	8,400	83.2%	$5.02	10.27	86,261	113,453
Lewis	34,232	1,068	3.1%	$176.38	255.39	272,760	516,237
Lincoln	5,846	332	5.7%	$37.03	85.48	28,380	54,843
Mason	30,618	4,125	13.5%	$9.94	22.02	90,831	125,627
Okanogan	21,112	377	1.8%	$175.82	119.58	45,083	75,459
Pacific	15,276	275	1.8%	$424.24	52.18	14,350	24,406
Pend Oreille	7,615	7,319	96.1%	$10.82	11.07	81,036	132,971
Pierce	326,768	10,255	3.1%	$62.51	43.83	449,479	2,368,268
San Juan	11,679	298	2.6%	$164.07	316.96	94,455	141,839
Skagit	49,996	3,219	6.4%	$56.28	82.85	266,710	487,381
Skamania	5,460	214	3.9%	$86.93	156.20	33,427	75,324
Snohomish	280,718	14,558	5.2%	$57.90	233.10	3,247,824	4,935,938
Spokane	198,672	36,800	18.5%	$18.19	26.23	965,428	2,225,826

County	Housing Units	HHW Participants	% Participant / Housing Units	HHW Cost / Participant	HHW lbs / Participant	HHW Total lbs	HHW, SQG, & Used Oil Total lbs
Stevens	20,096	412	2.1%	$46.11	318.80	131,345	325,131
Thurston	105,694	16,479	15.6%	$31.10	81.94	1,350,325	2,091,370
Wahkiakum	2,106	39	Inc. w/ Cowlitz	Inc w/ Cowlitz	Inc w/ Cowlitz	Inc w/ Cowlitz	12,216
Walla Walla	23,442	1,896	8.1%	$79.90	43.57	82,611	133,160
Whatcom	88,929	7,283	8.2%	$51.19	36.41	265,202	739,123
Whitman	19,041	902	4.7%	$36.50	32.02	28,881	57,210
Yakima	85,661	1,526	1.8%	$198.30	230.65	351,967	1,175,498
STATEWIDE	**2,837,376**	**214,963**	**7.6%**	**$47.36**	**68.40**	**14,704,355**	**29,268,023**

* Columbia County total represents privately collected CESQG wastes only.

Household Hazardous Waste (HHW)

Participants per Housing Unit

Counties that exhibit ten percent or higher of participants per housing unit provide excellent public education to encourage use of facilities or events, have very convenient locations for their collection facilities, or both. The participation number and rate for Klickitat and Pend Oreille Counties seem high and were not verified before this report was completed.

Cost per Participant

This statistic is hard to compare because of the many variables in program costs. Some programs record every cost, whether direct or indirect; others record only the disposal and basic operation costs.

Larger counties have the advantage of efficiency in scale, both in quantities received and in disposition options. Also, there are differences in service levels of the basic program, accounting differences, and errors. However, this data does provide an idea of what is possible and an incentive to contact those counties that seem to operate efficiently. According to annual reports submitted to Ecology, HHW (does not include CESQG costs) programs spent just more than $10.1 million in 2009 statewide.

HHW Pounds per Participant

The average pounds collected statewide per participant for HHW was 68.4. Table 5.6 shows the top five counties with the highest collections of HHW in pounds per capita (not participant) for 2007-09. Statewide, HHW pounds per capita collected was 2.21 pounds.

Table 5.6
High Collections of HHW (No Used Oil Sites)
Pounds per Capita by County in 2007-09

HHW 2007		
County	**Size**	**Lbs**
Pend Oreille	<50K	**6.85**
Klickitat	<50K	**6.26**
Skagit	>100K	**4.42**
Skamania	<50K	**4.21**
Clark	>100K	**4.16**

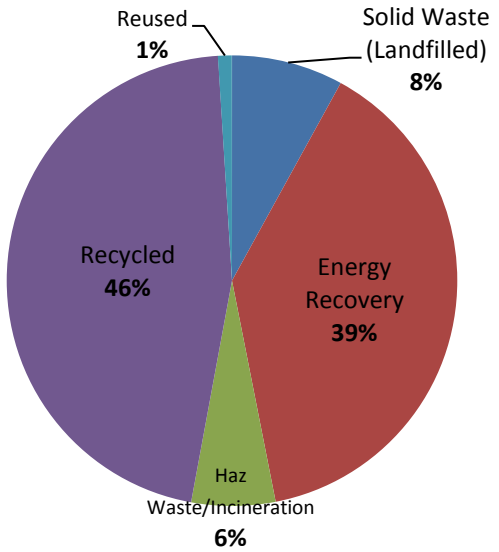
HHW 2008		
County	**Size**	**Lbs**
Pend Oreille	<50K	**5.22**
Clark	>100K	**5.18**
Lewis	50-100K	**4.82**
Klickitat	<50K	**4.52**
Kittitas	<50K	**3.74**

HHW 2009		
County	**Size**	**Lbs**
Pend Oreille	<50K	**6.28**
San Juan	<50K	**5.80**
Thurston	>100K	**5.41**
Snohomish	>100K	**4.61**
Klickitat	<50K	**4.27**

HHW Disposition

Figure 5.3 shows the final disposition of all HHW collected throughout Washington State.

Figure 5.3
HHW Final Disposition



Conditionally Exempt Small Quantity Generator (CESQG)

Twenty-two local MRW programs collect CESQG wastes. King County began a pilot program to collect CESQG wastes in 2008 and that pilot continued in 2009. The city of Tacoma offers CESQG's collection assistance for fluorescent lights only. Counties that sponsor CESQG waste collections are:

Asotin	Grays Harbor	Lewis	Snohomish
Benton	Island	Okanogan	Thurston
Chelan	Jefferson	Pacific	Whatcom
Cowlitz	King	Pierce	Yakima
Douglas	Kitsap	San Juan	
Grant	Kittitas	Skagit	

The top five counties that publicly collected the most CESQG waste per capita in 2009 were:

- Lewis
- Yakima
- San Juan
- Whatcom
- Kitsap

Table 5.7 shows the total amount of CESQG waste collected publicly and privately in each county. When we take into account both public and private collection numbers, the top five counties for CESQG collections per capita in 2009 were:

- Franklin
- Whatcom
- Spokane
- Grays Harbor
- Lewis

Table 5.7
2009 Washington State Public and Private CESQG Collections in Pounds by County

County	Publicly Collected CESGQ Waste	Public CESQG Waste Collected/Capita	Privately Collected CESGQ Waste	Total CESQG Waste Collected	Total CESQG Waste Collected/Capita
Adams	0	0	1,670	1,670	.09
Asotin	2,949	.14	1,259	4,208	.20
Benton	6,328	.04	57,763	64,091	.38
Chelan	9,035	.12	15,870	24,905	.34
Clallam	0	0	53,658	53,658	.77
Clark	0	0	183,589	183,589	.43
Columbia	0	0	1,773	1,773	.43
Cowlitz	26,014	.26	11,041	37,055	.37
Douglas	825	.02	10,407	11,232	.30
Ferry	0	0	767	767	.10
Franklin	0	0	305,261	305,261	4.20
Garfield	0	0	195	195	.09
Grant	575	.01	10,838	11,413	.13
Grays Harbor	17,964	.25	78,790	96,754	1.36
Island	19,158	.24	2,664	21,822	.27
Jefferson	6,075	.21	24,140	30,215	1.04
King	105,896	.06	1,381,730	1,487,626	.78
Kitsap	104,116	.42	185,956	290,072	1.17
Kittitas	894	.02	3,101	3,995	.10
Klickitat	0	0	441	441	.02
Lewis	61,739	.82	37,007	98,746	1.31
Lincoln	0	0	3,324	3,324	.32
Mason	0	0	34,796	34,796	.61
Okanogan	3,651	.09	3,364	7,015	.17
Pacific	325	.01	1,846	2,171	.10
Pend Oreille	0	0	2,554	2,554	.20
Pierce*	3,989	.01	1,013,580	1,017,569	1.25
San Juan	9,880	.61	0	9,880	.61
Skagit	11,912	.10	18,759	30,671	.26
Skamania	0	0	1,377	1,377	.13
Snohomish	183,545	.26	116,623	300,168	.43
Spokane	0	0	701,980	701,980	1.51
Stevens	0	0	3,686	3,686	.08
Thurston	45,990	.18	206,431	252,421	1.01
Wahkiakum	0	0	476	476	.12
Walla Walla	0	0	4,284	4,284	.07
Whatcom	116,431	.60	203,485	319,916	1.66
Whitman	0	0	10,954	10,954	.25
Yakima	180,610	.76	24,510	205,120	.86
Statewide Totals	**917,901**	**.14**	**4,719,949**	**5,637,850**	**.85**

* City of Tacoma's CESQG program collects fluorescent lighting only.

Table 5.8 shows the total amount of CESQG waste collected publicly and privately by waste type. Excluding the "Other DW" category, the top five CESQG waste types collected in 2009 were:

- Antifreeze
- Non-Regulated Liquids
- Flammable Liquids
- Oil-Base Paint
- Mercury Collections (includes all mercury waste types)

Table 5.8
Washington State Public and Private CESQG Collections for 2009 by Waste Type

Waste Type	Public Collections	Private Collections	Totals
Antifreeze	10,554	2,532,960	2,543,514
Non-Regulated Liquids	41,914	854,284	896,198
Flammable Liquids	119,050	587,440	706,490
Other DW	31,562	421,531	453,093
Paint - Oil Base	255,785	49,340	305,125
Mercury Collections	105,458	14,233	119,691
Paint - Latex	89,861	11,091	100,952
Used Oil - Non-Contaminated	59,390	15,838	75,228
Paint - Latex Contaminated	27,864	36,252	64,116
Paint - Oil Base -Contaminated	0	49,960	49,960
Bases	18,275	20,783	39,058
Batteries - Auto Lead Acid	26,932	9,588	36,520
Flammable Solids	7,087	28,214	35,301
Acids	13,966	14,928	28,894
Used Oil - Contaminated	933	25,117	26,050
CRT's	10,768	12,668	23,436
Pesticides - Poison/Liquid	13,332	5,232	18,564
Flammable Liquid Poison	13,840	4,367	18,207
Batteries - Alkaline/Carbon	14,143	2,864	17,007
Aerosols - Consumer Commodities	5,537	9,153	14,690
Pesticides - Poison/Solids	8,317	4,905	13,222
Oil w/ PCB's	12,787	0	12,787
Batteries-Nicad/Lithium	5,959	1,929	7,888
Photo/Silver Fixer	7,090	681	7,771
Batteries - Small Lead Acid	5,168	250	5,418
Oxidizers	3,758	847	4,605
Chlorinated Solvents	2,301	1,540	3,841
Oil Filters	1,937	950	2,887
Flammable Butane/Propane	1,776	320	2,096
Electronics	0	1,620	1,620
Flammable Gas Poison - Aerosols	1,256	0	1,256
Acids - Aerosols	921	0	921
Oil w/Chlorides	0	503	503
Bases - Aerosols	1	451	452
Flammable Gas Poison	286	0	286
Organic Peroxides	11	105	116
Flammable Liquid Poison - Aerosols	45	0	45
Reactives	37	5	42
Totals	**917,901**	**4,719,949**	**5,637,850**

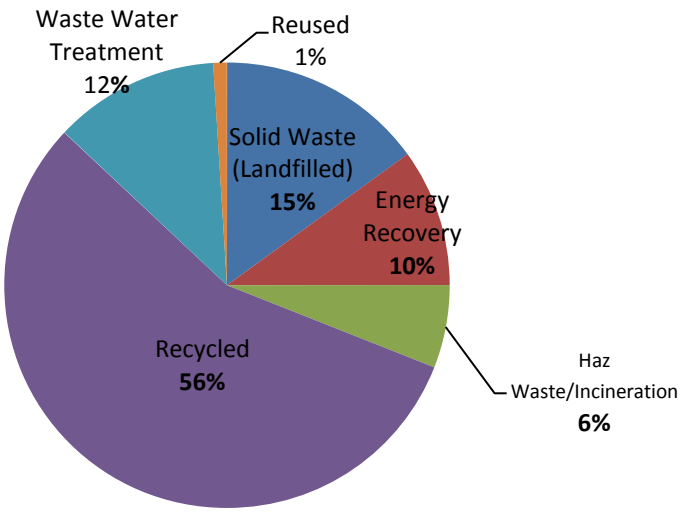
* Note: Approximately 45 percent of all CESQG wastes collected comes from collection of antifreeze.

CESQG Disposition

Sixty-six percent of all CESQG waste collected was either recycled or used for energy recovery. See Figure 5.4 for the complete disposition of CESQG wastes. There are several differences between final disposition of HHW and CESQG wastes worth noting:

- 38 percent of HHW was sent for energy recovery versus 10 percent of CESQG wastes.
- Very little HHW (less than .3 percent) was sent through a waste water treatment plant versus 12 percent of CESQG wastes.
- 8 percent of HHW was sent to a SW landfill versus 15 percent of CESQG wastes.

Figure 5.4
CESQG Final Disposition



Collection/Mobile Events

Table 5.9 represents the number of mobile and collection events held statewide from 2007-09. The number of events conducted has increased every year. However, the total pounds collected decreased each year. This drop may in part be attributed to a few jurisdictions deciding to no longer accept latex paints.

The amount of waste collected through these types of events was approximately 2 million pounds in 2009, which is a little more than 7 percent of all MRW collected in 2009, down from 8 percent in 2008 and 11 percent in 2007. The Waste Mobile in King County conducted 51 mobile events that collected a little more than 762,000 pounds of MRW in 2009.

Table 5.9
2007-09 Collection/Mobile Event Collection Amounts

Type of Event	Number of Events			Pounds Collected		
	2007	2008	2009	2007	2008	2009
Mobile	63	90	99	2,963,460	1,909,138	1,574,873
Collection	51	45	42	686,737	694,049	507,311
Totals:	**114**	**135**	**141**	**3,650,197**	**2,603,187**	**2,082,184**

Used Oil Sites

In 2009, facilities and collection sites reported collecting a total of 8,925,818 pounds of used oil. Used oil collection peaked statewide (12.4 million pounds) in 2004 and has steadily declined until this year. Even with the slight increase in used oil collections in 2009 (approximately 300,000 pounds), used oil collections need to be continually monitored. There are more cars on the road than ever, so one would expect this category to keep increasing. The recent trend to change oil every 5,000 miles compared to 3,000 miles and less do-it-yourself oil changers may be impacting this category. See Table 5.10 for the six counties with the highest collections in pounds per capita by county size for 2007-09.

Table 5.10
Used Oil High Collection Counties - Pounds per Capita by County Size
Collected at Facilities and Used Oil Collection Sites 2007-09

Used Oil Sites - 2007		
County	**Size**	**Lbs**
Mason	50-100K	**8.1**
Stevens	<50K	**5.1**
Wahkiakum	<50K	**4.1**
Skamania	<50K	**4.0**
San Juan	<50K	**3.8**
Yakima	>100K	**3.6**

Used Oil Sites - 2008		
County	**Size**	**Lbs**
Garfield	<50K	**9.1**
Stevens	<50K	**4.8**
Skamania	<50K	**4.0**
Lincoln	<50K	**3.5**
Pacific	<50K	**3.4**
San Juan	<50K	**3.2**

Used Oil Sites - 2009		
County	**Size**	**Lbs**
Garfield	<50K	**8.0**
Stevens	<50K	**4.3**
Skamania	<50K	**3.8**
Pend Oreille	<50K	**3.8**
Wahkiakum	<50K	**2.9**
Cowlitz	50-100K	**2.9**

Statewide Level of Service

The Washington State Office of Financial Management reported that as of 2009 Washington State had an estimated 2,837,376 housing units[2]. MRW Annual Reports revealed there were 214,963 participants. The actual number of households served is larger because most used oil sites do not record or report numbers of participants. The actual number of households served is also larger because some participants counted at events or by facilities bring HHW from multiple households.

One way to estimate the approximate number of households served is to add ten percent to the participant values. This method gives an estimate of 236,459 participants served in 2009. This number represents 8.3 percent of all households in Washington State. Table 5.11 shows the percent of participants served statewide since 2001.

[2]This information was downloaded from Web site http://ww.ofm.wa.gov/

Table 5.11
Percent of Participants Served Statewide

Year	Percent Participants Served	Year	Percent Participants Served
2001	6.1	**2006**	8.6
2002	6.8	**2007**	9.1
2003	8.9	**2008**	8.7
2004	8.9	**2009**	8.3
2005	9.0		

Trends in Collection

The majority of counties in Washington State have at least one fixed facility. The number of collection events held in 2009 increased from 114 in 2007 to 141 in 2009. As the population grows, collection events can be a useful strategy to reach residents inconveniently located from fixed facilities.

Overall, MRW collections leveled off between 2005 and 2007. 2009, like 2008, has seen a significant reduction in the amount of MRW collected. This is most likely due to some larger programs policy of no longer collecting latex paint and the overall state of the economy.

Also, as product stewardship programs become more prevalent in the future, collection numbers will most likely go down accordingly. The Electronics Recycling Program started collecting covered electronic products in 2009. As expected, MRW programs collected approximately 1.3 million pounds less in 2009 than 2008. MRW programs collected close to two million pounds of electronics and CRTs in 2008 compared to a little over 700,000 pounds in 2009. For more information about the E-Cycle Washington Program, see Chapter 2.

Product Stewardship

Some other methods of managing MRW are beginning to gain wider acceptance in Washington State and across the country.

Product stewardship efforts have resulted in the statewide electronics recycling program. In 2010, the Washington State Legislature passed a product stewardship bill for mercury-containing lighting products. Work is continuing for paint and legislation is scheduled for introduction in the 2012 legislative session.

This is a positive shift in MRW management as some manufacturers are beginning to accept responsibility for the end-of-life management costs of their products versus externalizing those costs onto public agencies.

It remains to be seen what role MRW facilities will play in the future as product stewardship becomes more widespread. Will MRW facilities continue to collect products, but be reimbursed by industry for management of their products, or will MRW facilities choose to let industry find alternative locations and personnel to manage their programs?

Product stewardship principles have also guided establishment of the Take-it-Back Network in King County, Snohomish County, Pierce County, Yakima County and the city of Tacoma.

The Take-it-Back Network was set up by local governments and consists of "*a group of retailers, repair shops, nonprofit organizations, waste haulers and recyclers that offer convenient options for recycling certain products that should not be disposed in the trash.*" The Take-it-Back Network is a voluntary program for businesses. Due to this arrangement it can be difficult to get data on the total amount of materials brought back to businesses.

Emerging Waste Streams

Pharmaceuticals and personal care products continue to be an area of concern for local governments and the public.

Groups like the Northwest Product Stewardship Council are working with state and local governments, NGOs, retailers and manufacturers to develop strategies to manage these emerging wastes based on product stewardship principles.

Pharmaceuticals

Pharmaceutical wastes have drawn more and more attention from state and local governments. A USGS Reconnaissance Study from 1999 - 2000 tested 139 streams for the presence of 95 chemicals, including pharmaceuticals.

Steroids, nonprescription drugs and insect repellent were the chemical groups most frequently detected. Detergent metabolites, steroids and plasticizers generally were measured at the highest concentrations. Forty-six of the chemicals were pharmaceutically active. In 2006, another study by Eastern Washington University and the USGS analyzed nine biosolids products from seven states. The concentration of pharmaceuticals in biosolids was higher than in water and treated wastewater.

Two tadpoles after 57 days of development in the lab. The one on the right, which has yet to sprout limbs, was exposed to fluoxetine, also known as Prozac, at 50 parts per billion.

In 2005, 53 million prescriptions were filled in Washington State. A 2006 King County Survey found that only 33 percent of people will use all of their medication. This leaves a substantial amount of pharmaceutical waste to manage. This becomes significant from a public health standpoint. In 2004 the American Association of Poison Control Centers (62 participating members serving 294 million people) reported a total of 2.4 million exposures. Fifty-eight percent of those exposures were from pharmaceuticals.

In 2006, a new two-year pilot program started to collect pharmaceuticals at local pharmacies. Group Health sites participated initially, with Bartell Drugs participating later. Between October 2006 and September 2007, 2,972 pounds of medication were collected.

Since this time some local governments have partnered with law enforcement agencies to collect unwanted or leftover medicines. Over the last two years approximately 75,000 pounds were safely collected and disposed of by these programs.

The environmental side effects of pharmaceuticals show that aquatic and terrestrial organisms may be affected through endocrine disruption and anti-microbial resistance.

Though product stewardship legislation has not passed over the last couple of years, it will be introduced again in 2011.

Personal Care Products

Personal care products are also becoming a concern for state and local governments. Personal care products include cosmetics, deodorants, nail polish, lotions, hair spray, styling gel, perfumes and colognes. According to industry estimates reported by the Toxic-Free Legacy Coalition:

- Consumers may use as much as 25 cosmetic products containing more than 200 different chemical compounds on any given day.

- Eighty-nine percent of the approximately 10,500 ingredients used in personal care products have <u>not</u> been screened for safety by the FDA or anyone else.

- One chemical of concern found in personal care products are phthalates. Phthalates are a reproductive toxin/endocrine disrupter. Some studies have shown impacts on male reproductive system development.

    - Moms with higher phthalate exposures were more likely to have boys with altered genital development including smaller penises and undescended testes (Swan et al., 2005; Marsee et al., 2006).

    - Baby boys exposed to higher levels of phthalates in breast milk had slightly, but significantly decreased testosterone levels (Main et al., 2005).

Appendix A
Tire Report to the Legislature

Waste Tire Pile Cleanups 2007-10

In 2005, the Washington State Legislature passed Substitute House Bill (SHB) 2085, creating the Waste Tire Removal Account (08R) to fund cleanup of unauthorized and unlicensed tire piles. Funds for this account come from a $1 fee charged on each new replacement tire sold in Washington. The 2009 Legislature removed the sunset on this fee and allocated an annual budget of $500,000 to Ecology (Senate Bill 5796). The balance of the account transfers to the Washington State Department of Transportation's Motor Vehicle Account on September 1 of odd numbered years. The following subsections report on the information requested in RCW 70.95.530 (see highlighted text in box).

Chapter 70.95.530 RCW states **(emphasis added)**: *" On September 1st of even-numbered years, the department of ecology shall provide a report to the house [of representatives] and senate transportation committees on the progress being made on the* ***cleanup of unauthorized waste tire piles*** *in the state and efforts underway to* ***prevent the formation*** *of future unauthorized waste tire piles. The report must detail any* ***additional unauthorized waste tire piles*** *discovered since the last report and present a plan to clean up these new unauthorized waste tire piles if they have not already done so, as well as include a* ***listing of authorized waste tire piles and transporters.*** *The report must also include the* ***status of funds*** *available to the program and a* ***needs assessment*** *of the program. On September 1, 2010, the department shall also* ***make recommendations*** *to the committees for an ongoing program to prevent the formation of future unauthorized waste tire piles. Such a program, if required, must include joint efforts with local governments and the tire industry."*

The Waste Tire Removal Account funded seven cleanup contracts starting in May 2007 through September 2010. These contract efforts removed more than 5 million tires from 175 waste tire piles in 30 counties across the state (1 ton of tires is about 100 passenger tires). These tire pile removals include all the remaining unauthorized tire piles identified in the 2005 report to the Legislature (Ecology Publication 507043). Table A-1 provides a summary of tire pile cleanups by county.

Table A-1
Tire Pile Cleanup 2007-10

County	Sites	Tons	Cost	% Recycled
Adams	1	213	$ 51,659	100%
Benton	8	1,044	$ 227,252	84%
Chelan	4	814	$ 188,400	72%
Clallam	7	1,321	$ 368,883	78%
Clark	3	742	$ 144,209	94%
Cowlitz	5	331	$ 70,011	93%
Franklin	5	1,293	$ 326,819	91%
Grant	14	2,636	$ 707,921	78%
Grays Harbor	11	1,620	$ 289,573	92%
Island	1	43	$ 7,852	100%
Jefferson	7	1,046	$ 221,390	78%
King	11	2,233	$ 418,061	91%
Kitsap	2	249	$ 42,630	99%
Kittitas	6	965	$ 242,169	100%
Klickitat	17	21,489	$ 2,464,005	13%
Lewis	13	6,390	$ 1,036,278	39%
Lincoln	7	747	$ 236,396	92%
Mason	6	1,303	$ 237,354	97%
Okanogan	2	557	$ 157,635	99%
Pend Oreille	3	213	$ 26,693	98%
Pierce	8	823	$ 158,789	95%
Skagit	1	62	$ 13,154	91%
Snohomish	4	486	$ 127,258	92%
Spokane	5	1,399	$ 277,789	100%
Stevens	1	97	$ 23,367	100%
Thurston	5	1,225	$ 244,165	97%
Walla Walla	3	415	$ 105,445	88%
Whatcom	4	237	$ 61,784	73%
Whitman	1	278	$ 50,652	66%
Yakima	10	4,560	$ 921,052	20%
TOTAL	**175**	**54,832**	**$ 9,448,644**	**84%**

Waste Tire Pile Prevention

In May 2010, Ecology allocated funding not committed to cleanup contracts to local waste tire efforts. Waste tire pile prevention activities were the priority for these local efforts. Individual agreements are in place with the 16 public entities listed in Table A-2. One project does not have a tire pile prevention or removal focus: Washington State University's proposal to do a literature review and feasibility study of tire shred use in civil engineering projects.

Requests for funding usually involved hosting local amnesty events for private citizens and providing education for proper waste tire management. Several counties are offering selected property owners vouchers for free tire drop-off and providing followup enforcement. One county will conduct enforcement visits at Ecology funded cleanup sites to confirm proper waste tire management. Table A-2 explains more about each tire project, including those not funded.

Table A-2
Locally Funded Tire Efforts 2010

Organization	Cost	Prevention	Removal	Education
Colville Confederated Tribe	$ 78,625	X	X	X
Jefferson County Health	10,350	X	X	X
Benton County Mosquito Control	4,187	X	X	X
Lewis County Solid Waste	4,085	X	X	X
Kitsap County Solid Waste	42,566	X	X	X
Skagit County Public Health	10,000	X	X	X
Snohomish County Solid Waste	18,208	X	X	X
WSU Civil Engineering	18,800			X
Whitman County Solid Waste	9,300	X	X	X
King County Solid Waste	4,500	X	X	X
Grays Harbor County Health	13,225	X	X	X
Spokane Tribe	5,000	X	X	X
Moses Lake Irrigation District	1,500	X	X	X
Walla Walla City/County	11,020	X	X	X
Whatcom County Health	25,020	X	X	X
Mason County Health	5,000	X	X	X
Total Expected Cost	**$261,386**			

New Unauthorized Waste Tire Piles

Table A-3 contains Ecology's list of currently identified waste tire piles in Washington. This list includes sites identified by private property owners inquiring about tire removal funding from Ecology. Some of these property owners may have already removed the tires. Some of the sites could be included in local tire efforts at the discretion of the public entity applying for the funding. For example, one unauthorized tire pile identified in 2009 (Quinault community tire pile) is currently included in the Grays Harbor County Health local project funded by the Waste Tire Removal Account.

Table A-3
Identified Waste Tire Piles

Site Name	County	City
Welch tire pile	Clallam	Agnew
Nelson tire pile	Clallam	Forks
Bellamy tire pile	Grant	Moses Lake
Beach cleanup	Grays Harbor	Aberdeen
Cole tire pile	Grays Harbor	Oakville
Ackerman tire pile	Jefferson	Quilcene
Constantine tire pile	King	Ravensdale
Matchett tire pile	Lewis	Glenoma
Ethel tire pile	Lewis	Ethel
Centralia tire pile	Lewis	Centralia
King tire pile	Lincoln	Davenport
Stolen tire pile	Mason	Shelton
Anderson tire pile	Pacific	Long Beach
Graham tire pile	Pend Oreille	Newport
NE Tri-County Site	Pend Oreille	Newport
Scamhorn tire pile	Pierce	Buckley
Sundland Bark & Topsoil	Skagit	Anacortes
Qualco Energy	Snohomish	Monroe
Hendrickson tire pile	Snohomish	Snohomish
Stella tire pile	Spokane	Elk
Nisqually Land Trust	Thurston	Nisqually
Rents tire pile	Thurston	Olympia
Chapman tire pile	Thurston	Tumwater
Filan tire pile	Walla Walla	Walla Walla
Yakima Training Center	Yakima	Yakima

Authorized Waste Tire Storage and Hauling

There is one authorized waste tire storage site in Washington. The operation has a solid waste handling permit from the Skagit County Health Department. This permit limits storage at a maximum of 10,000 tire bales on the property. The operation also has a waste tire storage license and posted financial assurance sufficient to pay for removal of all collected tires by a third party.

There are 13 waste tire haulers licensed to operate in Washington (Table A-4). Each of these operations obtained a waste tire carrier license from the Department of Licensing and also posted a $10,000 bond. Businesses that use company owned vehicles to transport their own waste tires for the purposes of disposal, retreading or recycling are not required to obtain a waste tire carrier license (WAC 173-350-350).

Table A-4
Licensed Waste Tire Storage and Haulers

Waste Tire Storage	*UBI Number	License Expires
Larry's Auto & Truck Parts, Inc. Burlington, WA	297 004 683	3/31/2011
Tire Shredders, Inc. Goldendale, WA	601 222 460	1/31/2011
Waste Tire Haulers	**UBI Number**	**License Expires**
Enviro-Tire Inc. Kalispell, MT	602 879 404	11/30/2010
L&S Tire Company Spokane, WA	601 988 813	10/31/2010
Lakin Tire West Inc Santa Fe Springs, CA	600 341 245	6/30/2011
Larry's Auto & Truck Parts, Inc. Burlington, WA	297 004 683	3/31/2011
Los Gavilones, Vancouver, WA	602 433 710	10/30/2010
Rubber Granulators, Marysville, WA	600 316 292	4/30/2011
The Tire Depot, Polson, MT	602 845 744	4/30/2011
Tire Disposal & Recycling, Inc. Seattle, WA	601 911 765	11/30/2009
Tire Disposal Co, Inc. Molalla, OR	601 181 257	5/31/2011
Tire Dogs, Inc. Lacey, WA	602 241 368	10/31/2010
Tire Shredders, Inc. Goldendale, WA	601 222 460	1/31/2011
Washington Used Tire and Wheel, Inc. Puyallup, WA	601 312 013	4/30/2011

**UBI –Unified Business Identifier*

Waste Tire Removal Account Funding Status

A $1 fee on the sale of new replacement tires funds the Waste Tire Removal Account (Fund 08R). Tire retailers started collecting this fee on July 1, 2005 (Fiscal Year 2006 is July 1, 2005 to June 30, 2006). The tire fee is not collected on the sale of tires to the federal government that are exempt from sales tax; sale of tires delivered to enrolled tribal members living on recognized Native American reservations; or sale of re-treaded vehicle tires or tires provided free of charge under the terms of a recall or a warranty service (WAC 458-20-272). If a customer returns a tire and is refunded the entire selling price, the $1 tire fee is refundable as well.

Table A-5 provides details on the fee collection, expenditures and transfers. Expenses by the Department of Revenue relate to setup and oversight of the fee collection. Ecology's expenses include management of tire pile cleanups, funding of local tire projects, outreach and education for proper waste tire management, and technical assistance to business and local government. The table shows funds transferred in 2009 to the Washington State Department of Transportation (WSDOT) "*. . . motor vehicle account for the purpose of road wear related maintenance on state and local public highways*" (RCW 70.95.532). The table provides a cumulative account balance for each fiscal year and shows the fund status at the end of Fiscal Year 2010.

Table A-5
Waste Tire Removal Fee Revenue and Expenses

Fiscal Year	Tire Fee Collection	Ecology and Revenue Expenditures	Transfer to WSDOT	Tire Fee Account Balance
2006	$ 3,193,007	$ 222,106	-0-	$2,970,901
2007	3,789,059	665,774	-0-	6,094,186
2008	3,802,147	4,522,302	-0-	5,374,031
2009	3,602,051	2,715,345	$5,600,000	660,737
2010	3,631,646	1,519,596	169,827	2,602,960
Total	**$18,017,910**	**$9,645,123**	**$5,769,827**	**$2,602,960**

Table A-6 details Ecology's budget (technically termed an "appropriation"), expenses and annual account balance for each fiscal year. Ecology budget status at the end of Fiscal Year 2010 (June 30, 2010) totals $544,926. Ecology continues to use the biennial appropriation of $1 million to fund local tire projects (RCW 70.95.532).

Table A-6
Ecology Waste Tire Removal Account Expenditures

Fiscal Year	Ecology Appropriation	Ecology Expenses	Appropriation Balance
2006	$4,000,000	$ 35,057	$3,964,943
2007	-0-	665,774	3,299,169
2008	5,000,000	4,520,302	3,778,867
2009	-0-	2,715,345	1,063,522
2010	1,000,000	1,518,596	544,926
Total	**$10,000,000**	**$9,455,074**	**$ 544,926**

Waste Tire Program Needs Assessment

In 2010, Ecology inquired with local governments and other public entities about the need for funding tire projects that prevent accumulation of tire piles. Available funding in 2010 was limited to the balance remaining after completion of the final tire pile cleanup contract. Requests for funding from public entities exceeded the available $260,000. Additional requests for consideration of waste tire projects were received at Ecology after the 2010 funds were fully committed. These unfunded requests represent future needs for waste tire program funding.

Organizations receiving funding in 2010 represent a small portion of the state (refer to Table A-2). Ecology collaborated with counties, cities, tribes, districts, and universities for the 2010 funding efforts. Future tire funding allocation will continue into the next biennium for public entities to complete local waste tire projects. The initial tire funding effort in 2010 supported a very limited number of the public project across the state: only 15 of the nearly 500 public entities - about 3 percent.

There are 39 counties; 281 cities and towns; 30 federally recognized tribes; 41 universities and community colleges; and 96 other districts (conservation, irrigation and mosquito control) that qualify for Ecology funded tire projects. It is safe to assume there are many more local governments with needs for tire funding (refer to the unfunded projects in Table A-7). There is definitely an ongoing need to provide funds to local government for similar waste tire pile prevention efforts. Ecology tire funding ($1 million biennially) will continue to be allocated to local governments (and other public entities) for tire prevention projects.

Tire Program Recommendations

Ecology recommends the current allocation of $1 million per biennium continue. These funds will be provided to local public entities for ongoing waste tire pile prevention program efforts.

Table A-7
Needs Assessment: Tire Project Applications

Summary of Tire Project Applications
2010 Funded Applications
Colville Confederated Tribe: $78,625 for removal of waste tires collected from tribal members during reservation cleanup.
Jefferson County Health: $10,350 for one-day weekend tire amnesty event for south county residents. Include outreach at solid waste complaint sites and roadside cleanup. Provide educational materials to all attendees for future proper tire management.
Benton County Mosquito Control: $4,187 to support the 2011 Tire Drive for county residents to drop off tires for free. Removal of mosquito breeding habitat is a priority for Benton County.
Lewis County Solid Waste: $4,085 to host a one-day east county tire collection event. This will provide support to the remote part of the county.
Kitsap County Solid Waste: $42,556 to host a one-month tire collection effort. Residents of North Mason County are eligible for this effort.
Skagit County Public Health: $10,000 for tire vouchers that waive landfill disposal fees for priority tire cleanups (determined by County staff). Follow-up enforcement efforts by staff.
Snohomish County Solid Waste: $18,208 for one tire amnesty event, residents limited to drop off 20 tires each free of charge.
WSU Civil Engineering: $18,800 to conduct a literature review for the feasibility of using shredded tire to substitute for granular materials in pavement construction. WSU has agreement from WSDOT that this information would be helpful for use of tire shreds in state highway projects.

Summary of Tire Project Applications
Whitman County Solid Waste: $9,300 for one tire collection event for county residents.
King County Solid Waste: $4,500 for Community Cleanup Assistance Program vouchers that waive landfill disposal fees for two distinct groups: victims of illegal dumping and those who are on a limited or fixed income (financial hardship). Code enforcement staff distributes the vouchers for tire cleanups.
Grays Harbor County Health: $13,225 for multiple tire related efforts: tire amnesty events in Quinault and Aberdeen, followup enforcement for Ecology contracted tire removals, advertising and educational materials.
Spokane Tribe: $5,000 for a 2010 tire cleanup project for reservation members in the eastern, central, and western areas.
Moses Lake Irrigation District: $1,500 to pay for removal of tires embedded or resting along the Moses Lake shoreline.
Walla Walla City/County: $11,020 for two tire amnesty events for residents of remote areas of Walla Walla County. Staff will conduct follow up outreach efforts at illegal dumping areas.
Whatcom County Health: $25,250 for an eastern county amnesty event in remote areas of the county to reduce illegal dumping issues.
Mason County Health: $5,000 to remove tires collected during south sound beach cleanup efforts.
Unfunded Applications
Asotin County Solid Waste: Construct a tire receiving facility at the landfill and reimburse the county for a tire abatement effort. Not funded to provide funding to more projects across the state. Reimbursement is not allowed for costs incurred.
Lewis County Solid Waste: Cleanup of three unauthorized waste tire piles, located in Glenoma, Packwood, Ethel, and Centralia. Property owners are required to sign an agreement to properly manage waste tires. The tire cleanup efforts were not funded to allow for amnesty efforts.
City of Olympia: Tire collection event. This funding was not allowed because it was to reimburse for costs incurred.
Snohomish County Solid Waste: Second tire amnesty event, residents limited to drop off 20 tires each free of charge. The second event was not funded to allow funding for other projects.
Projects Identified but Not Submitted in Time for 2010 Funding
City of Chelan: Support for tire removal efforts at the local publicly funded recycling operation.
Clallam County: Enforcement of tire regulations at illegal auto recycling operation, coordinate with Washington State Patrol commercial vehicles division and county code enforcement
Department of Natural Resources: Funding to support removal of scattered tires along public land
Grays Harbor County Beach Removal: Removal of tires used along the ocean shore at Bottle Beach. Effort requires significant coordination prior to removal.
Kittitas County: Draft new tire ordnance requirements.
Klickitat County: Tire pile abatement, amnesty event, outreach and education.
Lincoln County: Tire pile abatement, tires located in a streambed, requires collaboration with multiple agencies for work in water.
Mt. St. Helens Park Tire Removal: Collection and removal of scattered tires within the national park.
Mason County: Tire amnesty event, outreach and education.

Summary of Tire Project Applications
Northeast Tri County (Stevens, Pend Oreille, Ferry): Tire pile abatement, amnesty event, outreach and education – also interest from Ferry Conservation District for tire removal.
Pierce County: Tire amnesty event, outreach and education.
Snohomish County Beach Removal: Removal of tires used along the ocean shore at Meyer Beach, effort will require collaboration with the property owner as well as the Tulalip Tribe. Effort requires significant coordination prior to removal.
Spokane County: Tire pile abatement, amnesty event, outreach and education.
Tulalip Tribe: Removal of tires from the shoreline.
WA Department of Natural Resources: Removal of tires from DNR land around the state.
Washington State University: Continue to work with WSDOT on use of shredded tires in highway construction applications.
Whatcom County Health: Removal of tires from along the Nooksack River embankment, effort will require collaboration with the property owner as well as the Nooksack Tribe. This project was not organized in time for the 2010 funding period.
Yakama Nation: Tire pile abatement, amnesty event, outreach and education.

Background on Waste Tire Pile Cleanups 1989 - 1998

In 1989, the Washington State Legislature passed Substitute House Bill (SHB) 1671 (Sections 92 – 95) which established a $1 per tire fee on the retail sale of new vehicle tires for the Vehicle Tire Recycling Account (VTRA). This account provided approximately $14.4 million to clean up 34 unpermitted tire piles in 9 counties around Washington. Collection of the tire fee ended in 1994 and the account was fully spent in 1998 (Table A-8).

Table A-8
Tire Pile Cleanup 1990-98

Year	# Sites	Estimated # of Tires	Cost
1990	1	92,200	$102,667
1991	15	794,000	$1,816,894
1992	5	1,263,300	$1,241,133
1993	2	57,000	$65,394
1994	2	932,000	$694,947
1995	2	4,158,600	$4,114,859
1996	5	2,380,200	$3,235,372
1997	1	175,000	$310,200
1998	1	2,800,000	$2,850,000
Total	**34**	**12,652,300**	**$14,431,466**

Appendix B: Municipal Solid Waste (MSW) Generation, Recycling & Disposal

The discussion of the solid waste generation, disposal, recycling and diversion totals in Chapter 4 includes **all** types of waste disposed, composted materials, source-separated materials burned for energy, and non-municipal solid waste diverted from disposal. The following discussion is of the narrower, more "traditional" recycling, disposal and generation measures that include **only the municipal solid waste (MSW) stream**.

In 1989, the Legislature amended the *Solid Waste Management Act* (Chapter 70.95 RCW). The law set a state recycling goal to achieve 50 percent by 1995. The 50 percent rate set by the Legislature refers to the MSW recycling rate. To determine this rate and ensure it is consistent and comparable with past years, 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 (MSW) by the Environmental Protection Agency.[1]

The law also states that recycling should be at least as affordable and convenient to citizens as garbage disposal. In response, local governments put in place various forms of recycling. These efforts ranged from drop boxes to curbside collection of a variety of recyclable materials. Despite all the efforts citizens, government and industry made, the state did not reach the 50 percent goal by 1995. In 2002, the Legislature amended the law and pushed back the 50 percent goal to 2007, but the state did not attain the 2007 goal. Legislators also set a state goal to establish programs to eliminate yard waste in landfills by 2012.

In 1999, Ecology began to expand what it measures to include materials outside of the state's definition of municipal recycling with the "solid waste diversion" measure. See Chapter 4 for a complete discussion on solid waste diversion. Ecology continues to measure progress on the narrower MSW recycling, since this is an important area for municipal governments and industry assessing progress on programs targeted toward changing the disposal practices of residents and businesses.

Although Washington did not achieve the goals established by the Legislature, Washington's recycling rate is increasing as infrastructure and markets develop. In 2009, there were 169 cities and unincorporated county areas offering curbside collection of recyclable materials such as paper, plastic and metals. This was a decrease from 185 in 2008. At the same time, 132 cities and county unincorporated areas offered curbside collection of yard waste, which was a decrease

[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 land clearing debris disposed at municipal solid waste landfills and incinerators.

from 146 in 2008. Despite the economic recession that caused severe cutbacks on the local government level to provide a recycling infrastructure, citizens continued to recycle at the same rate as 2008.

Ecology measures MSW recycling by quantifying the MSW materials recycled and dividing that by the total MSW generation (recycling plus disposal). State regulation requires landfills and incinerators to report municipal solid waste separate from other wastes by county of origin, which provides a reliable data source for the denominator.

Table B-1
MSW Recycling Rates in Washington

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%
2002	35%
2003	38%
2004	42%
2005	44%
2006	43%
2007	43%
2008	45%
2009	45%

Recycling Rates for MSW

Each year since 1986, Ecology has conducted a survey to measure the statewide recycling rate for municipal solid waste (MSW). Information comes from local governments, haulers, recyclers, brokers and other handlers of materials from the recyclable portion[2] of the waste stream.

From 1986 to 1995, the measured statewide recycling rate increased from 15 percent to 39 percent. This increase was steady, with minor variations. In 1996, the rate dropped to 38 percent. The 1997 recycling rate dropped again to 33 percent because of the poor paper fiber market in Asia and a continued glut in the metals market. Table B-1 shows MSW recycling rates for 1986 - 2009.

The poor paper and metal market trend continued in 1998, but improved enough to raise Washington's recycling rate to 35 percent. Although markets improved in 1999, the tonnage disposed of increased enough to drop the recycling rate to 33 percent.

Markets continued to improve in 2000, raising the recycling rate again to 35 percent. Although markets for most materials fell in 2001, the increased activity and better reporting for key materials brought the rate to 37 percent. Drops in market conditions for paper, glass and yard debris, combined with low reporting for food waste and a difference in how wood waste categories are calculated brought the rate down to 35 percent for 2002.

In 2003, the reporting requirements for recycling facilities changed with *Chapter 173-350 WAC, Solid Waste Handling Standards.* These changes resulted in better reporting of recyclables. In addition, the market demand for ferrous and nonferrous metals was high during 2003, which

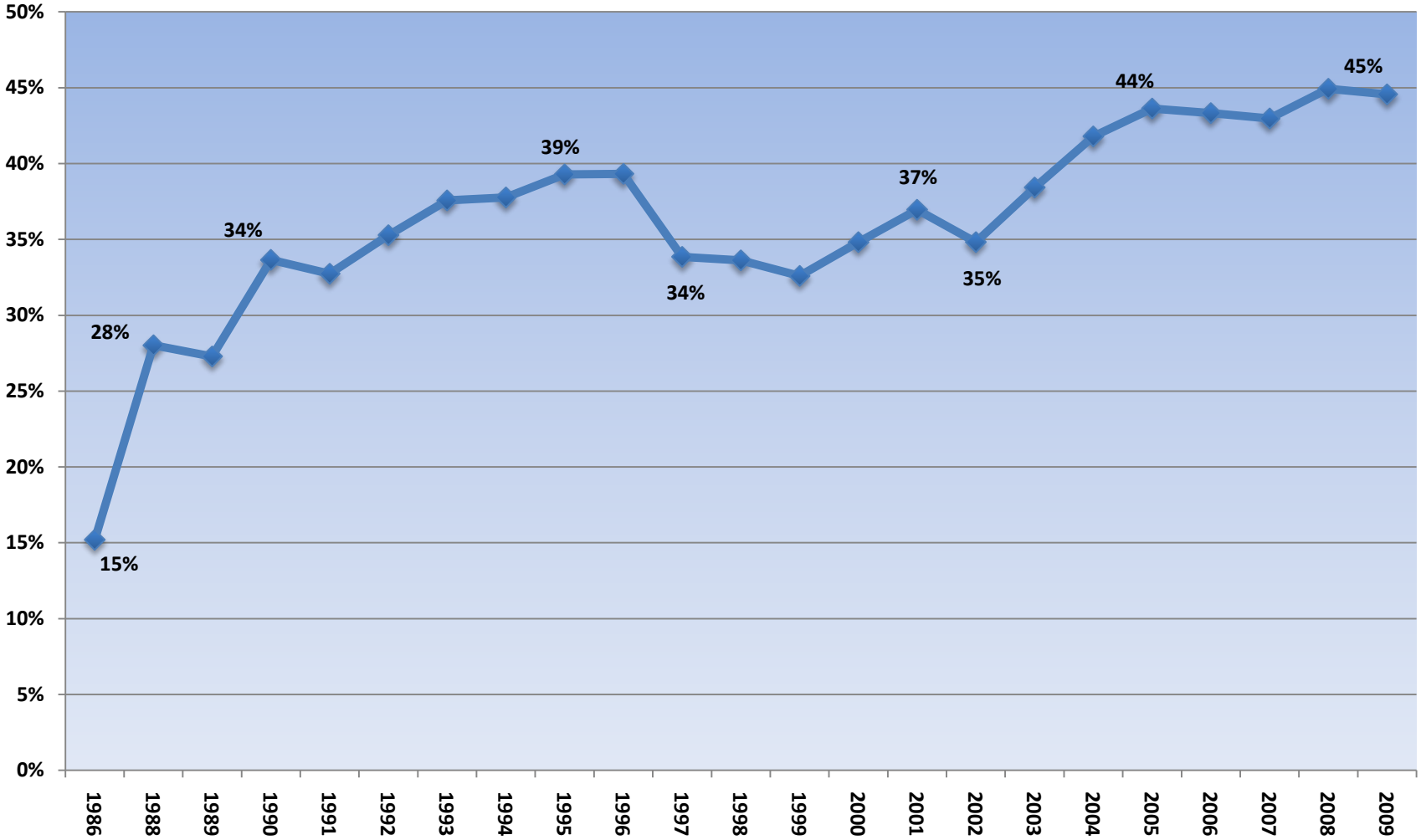
[2] The recyclable portion of the waste stream is municipal solid waste as defined by the Environmental Protection Agency in the *Characterization of Municipal Solid Waste in The United States: 1996 Update*. This includes durable goods, nondurable goods, containers and packaging, food wastes and yard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

aided in bringing the recycling rate up to 38 percent. With the continued strong reporting of recyclables collected along with market increases for metals, paper and yard debris, the MSW recycling rate hit 42 percent in 2004, and continued to climb to 44 percent in 2005.

In 2006, the recycling rate dropped slightly to 43 percent, and continued at that rate in 2007. The economic recession that began in 2008 brought a reduced disposal rate, and boosted the recycling rate to an all-time high of 45 percent in 2008. The recession continued in 2009 and lowered the amount of waste generated, yet the recycling rate remained at 45 percent (see Figure B-1). Detailed data on materials recovery since 1986 is available at http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

The *Beyond Waste Progress Report* also provides quantitative information on specific wastes such as organics and electronics, and the economic and environmental impacts of recycling. See http://www.ecy.wa.gov/beyondwaste/bwprog_front.html. Also, see *Chapter 2 - Partnering for the Environment through Beyond Waste Performance Indicators.*

Figure B-1
Washington State MSW Recycling Rate - 1986 to 2009



As of 2009, about 84 percent of the state's population had 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 nearly 1.2 million more people since 1995. Ecology believes newcomers, as well as longtime residents need ongoing education and advertising to learn to recycle, or continue to do so.

Many curbside programs in the state are changing to commingled or single-stream systems in an effort to reduce costs and increase collection of recyclables. This trend became more evident in 2003, as new sorting facilities and procedures went into operation, and has continued through 2009. Some evidence suggests the convenience of not having to sort recyclables leads to more residents taking part. In most cases, programs that changed to commingled collection also increased the range of materials collected; however, the act of commingling the recyclables can create a higher residual rate once the usable materials are sorted out.

Compared to source-separated collection programs, the single-stream programs are collecting about 10 percent more material. The results are also mixed where end markets are concerned. While the tons collected in the recycling system is staying steady, a report by Ecology in June 2010 indicates that a certain amount of the residential commingled recycling does not get recycled. Between 5 and 20 percent of some materials may not ultimately be recycled into new products. Such materials are either materials that the market cannot recycle yet and are collected anyway, or do not make it through the sorting system to the appropriate market. See "*Beyond the Curb" report in Chapter 2, Partnering for the Environment.*

Ecology is making an effort to quantify these residuals and determine the impact on the recycling and diversion data through annual reports from material recovery facilities and the recycling survey. Further studies may be needed including sampling at recycling facilities to more accurately determine the level of contaminants in the incoming materials stream and residuals in the outgoing materials stream at recycling facilities.

Measurement Methodology

See Chapter 4 for a complete discussion of measurement methodology as it pertains to recycling and diversion.

Results – 2009 MSW Recycling

So we can consistently compare results from year to year, Ecology includes the same materials it has used since 1986 to calculate the MSW recycling rate. These materials originate from the MSW stream as Ecology defined when designing the recycling survey in the mid-1980s. Table B-2 provides tonnage figures for each material that contributed to the MSW recycling rate from 2005-09.

Table B-2
MSW Recycled Tonnage Reported
MSW Recycling Rates[3] 2006-09

Recycled Materials Reported (MSW)	2006	2007	2008	2009
Aluminum Cans	14,951	14,005	12,842	**21,098**
Container Glass	90,992	96,934	94,077	**100,823**
Corrugated Paper	570,802	555,757	569,688	**491,266**
Electronics	11,386	12,325	17,265	**22,190**
Fats and Oils	97,786	116,964	124,289	**92,345**
Ferrous Metals	1,048,885	1,009,826	1,013,552	**889,685**
Fluorescent Light Bulbs	1,063	979	1,600	**1,229**
Food Scraps (post-consumer)	73,958	50,304	48,664	**77,699**
Gypsum	62,482	52,767	86,603	**38,662**
HDPE Plastics	8,000	11,348	7,742	**13,876**
High-Grade Paper	71,774	82,806	57,929	**47,266**
Large Appliances	49,796	44,667	43,401	**39,777**
LDPE Plastics	14,928	13,695	14,040	**15,407**
Milk Cartons/Drink Boxes-Tetra	5,755	5,787	5,475	**5,526**
Mixed Paper	316,874	361,043	367,834	**274,982**
Newspaper	294,887	289,250	282,981	**267,524**
Nonferrous Metals	135,976	115,718	94,340	**251,967**
Other Recyclable Plastics	7,776	12,350	11,245	**12,524**
Other Rubber Materials	39	50	6	**8**
PET Plastic Bottles	7,558	14,024	9,827	**16,767**
Photographic Films	458	429	442	**354**
Steel/Tin Cans	13,936	22,315	10,526	**17,293**
Textiles (Rags, Clothing, etc.)	28,724	65,286	19,946	**16,445**
Tires (Recycled)	23,528	27,869	40,124	**35,439**
Used Oil	87,304	86,174	78,443	**110,038**
Vehicle Batteries	25,414	25,734	25,219	**21,493**
Wood Waste	289,612	228,146	381,866	**200,980**
Yard Debris	665,902	684,181	641,130	**626,729**
Total MSW Recycled	**4,020,548**	**4,000,733**	**4,061,094**	**3,709,389**
Total MSW Disposed[4]	**5,258,076**	**5,309,296**	**4,978,496**	**4,613,329**
Total MSW Generated	**9,278,624**	**9,310,029**	**9,039,590**	**8,322,718**
MSW Recycling Rate	**43.33%**	**42.97%**	**44.93%**	**44.57%**

[3] Detail may not add due to rounding.

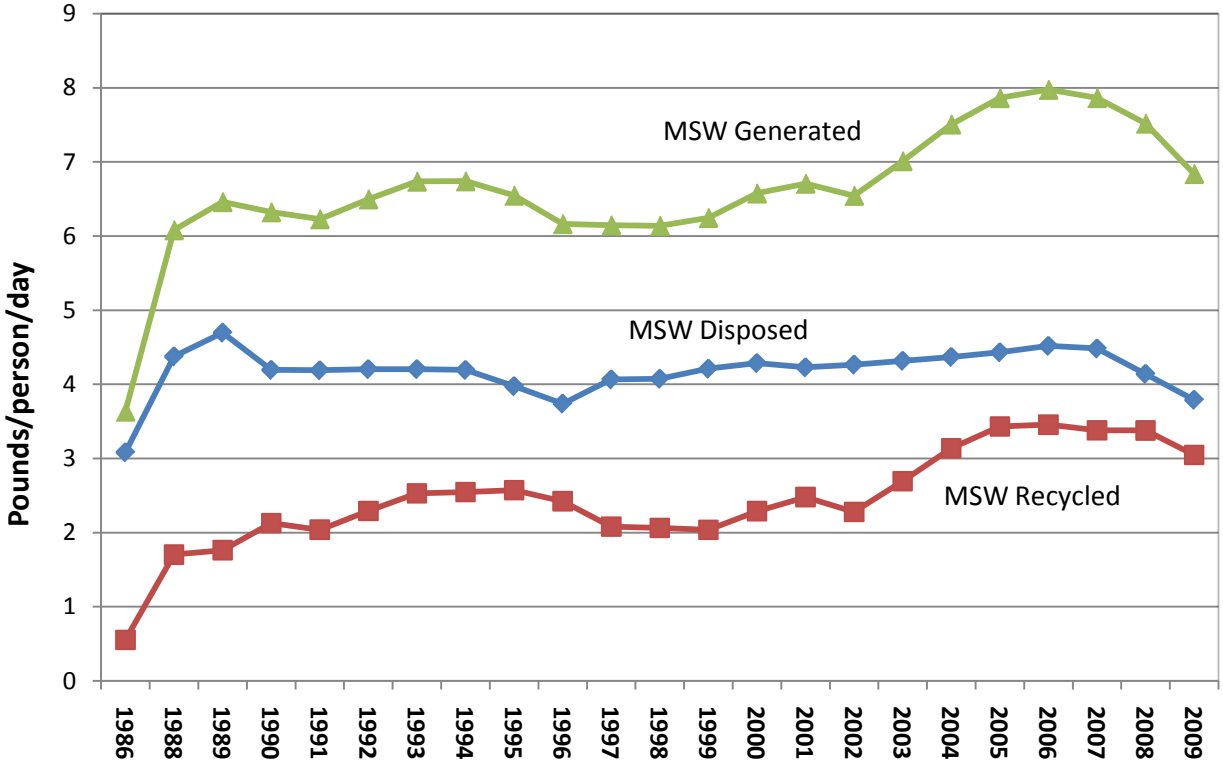
[4] The amount of MSW disposed represents only the quantity defined "recyclable portion" of the waste stream from municipal and commercial sources. It excludes the following waste types reported from landfills and incinerators: demolition, industrial, inert, wood, ash, sludge, asbestos, contaminated soils, tires, medical and other.

Individual Waste Generation (MSW)

Each person contributes to the MSW stream by recycling and disposing of wastes from his or her household, school, church, workplace and anywhere else solid waste is produced. The figures below present only an average of the total contributions of all residents. Some people may actually contribute much more waste than others. However, the picture tends to be more tangible when described in individual or "per person" terms. Figure B-2 shows an average of how each person in the state contributes to the **MSW stream**. See Chapter 4 for a discussion of overall waste generation.

In 2009, each resident of the state generated 6.84 pounds of municipal solid waste per day, disposing 3.79 pounds per person and recovering 3.05 pounds per person for recycling. These numbers have decreased since 2006, when we reached an all-time high of per capita waste generation of 7.97 pounds per person per day (see Table B-3).

Figure B-2
Pounds of MSW Disposed, Recycled & Generated Per Person/Day
1986 - 2009



Washington residents create, recycle and dispose of about two pounds of MSW per person above the national averages. This larger disposal number is attributed to Washington's larger amount of yard and wood waste than the national average, as well as a different method of measuring ferrous metals.

Comparing per capita numbers to other states' averages provides a check for Washington's recycling numbers. Additionally, at various points in the data gathering process, Ecology asks county recycling coordinators to check their county recycling and disposal numbers for accuracy. Ecology also checks the end-use information for recovered materials provided on the recycling surveys and annual reports to verify the classification as recycling, diversion or disposal, and capture and measure any new recycling and diversion that occurs.

Table B-3
Pounds MSW Disposed, Recycled and Generated Per Person/Day[5]
1999-2009

MSW Per Capita	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Disposed	4.21	4.29	4.23	4.27	4.32	4.37	4.43	4.52	4.48	4.14	**3.79**
Recycled	2.04	2.29	2.48	2.28	2.69	3.14	3.43	3.46	3.38	3.38	**3.05**
Generated	6.25	6.58	6.71	6.55	7.01	7.51	7.86	7.97	7.86	7.52	**6.84**

[5] See Chapter 4 for per capita numbers that include diversion and all waste types.