Solid Waste in Washington State

24th Annual Status Report

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Solid Waste in Washington State

Twenty-Fourth Annual Status Report

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For more information contact:

Waste 2 Resources Program
P.O. Box 47600
Olympia, WA 98504-7600

Phone: 360-407-6900

Washington State Department of Ecology - www.ecy.wa.gov

- Headquarters, Olympia 360-407-6000
- Northwest Regional Office, Bellevue 425-649-7000
- Southwest Regional Office, Olympia 360-407-6300
- Central Regional Office, Yakima 509-575-2490
- Eastern Regional Office, Spokane 509-329-3400

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Headquarters Office

Michelle Andrews
Janine Bogar
Kyle Dorsey
Lynn Gooding
Mary Harrington
Christine Haun
Sharon Hlavka
Miles Kuntz
Joanne Neugebauer-Rex
Kirsten Miller
Gretchen Newman
Julie Robertson
Tina Simcich
Megan Warfield
Dan Weston

Central Regional Office

Gary Bleeker

Eastern Regional Office

Mark Fuchs
Allison Kingfisher

Northwest Regional Office

Peter Christiansen
Dawn Marie Maurer
Isaac Standen
Steven Williams

Southwest Regional Office

Al Salvi

Editing/Document Production

Susanne McLemore

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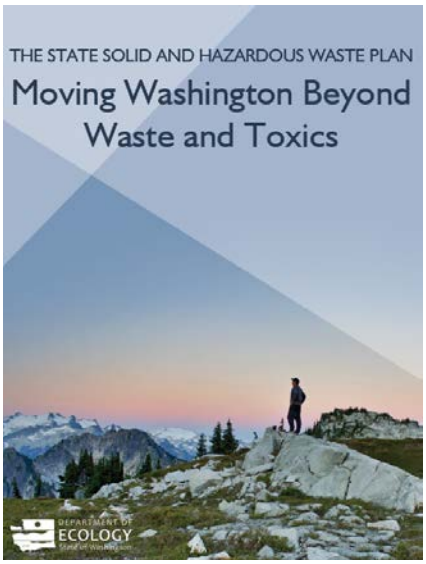
Chapter 1: Issues Facing Washington State

The State Solid and Hazardous Waste Plan: Moving Washington Beyond Waste and Toxics

The 2015 State Plan is complete and implementation is underway.



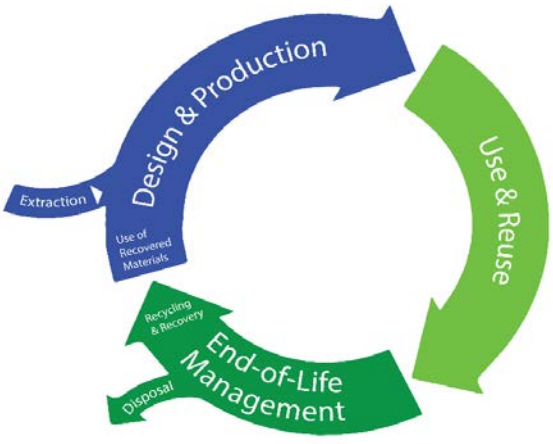
Why a State Plan?

Chapter 70.95 RCW, Solid Waste Management – Reduction and Recycling, directs Ecology to develop a solid waste management plan as a guide to carry out a state coordinated solid waste management program (*RCW 70.95.260*) and update it regularly. Ecology developed the first State Plan in 1972, and revised it in 1980, 1991, 2004, 2009, and now 2015. The 2015 update was created with input from almost 100 stakeholders in three rounds of comments.

Our goals with the 2015 plan update were to represent the statewide system in all of its diversity, make the plan more user friendly, and stay on track to achieve the vision of reducing waste and toxics, while safely managing what waste remains. Not only is reducing wastes and toxics the top priority of our waste management statutes, but it is also the smartest, cheapest, and healthiest approach to waste management.

Sustainable Materials Management

To help reduce waste and toxics, the state plan integrates sustainable materials management. This concept was introduced in 2004 by the U.S. Environmental Protection Agency (EPA). Sustainable materials management means using and reusing materials in the most sustainable way across their entire life cycle, from design, manufacturing and use, to end-of-life when the material is either disposed or recycled. This is important because the adverse environmental impacts of extraction, production, and use can be far greater than those associated with disposal.



Sustainable materials management helps conserve resources, reduces waste, slows climate change, and minimizes the adverse impacts of the materials we use. According to EPA, sustainably managing materials is essential to conserving our natural resources to meet both today's needs and those of future generations.

State Plan Contents

The State Plan has a new structure with five sections, each containing goals and actions for the next five years:

- *Managing Hazardous Waste and Materials* addresses regulated hazardous waste generators, pollution prevention plans, and moderate risk waste.
- *Managing Solid Waste and Materials* deals with waste reduction, recycling, litter, safe disposal, and organics management.
- *Reducing Impacts of Materials and Products* focuses on improving the materials that eventually become components of products or waste.
- *Measuring Progress* addresses data needed for assessing our progress toward the goals in the plan.

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

- *Providing Outreach and Information* focuses on communicating about the issues in the plan.

With the sustainable materials management approach and the new structure, we can better address the current system, while also move up the materials management cycle to the use and design phase to find ways to reduce waste and toxics. This approach is consistent with the state waste management hierarchy in RCW 70.95.

State Plan Implementation

The Waste 2 Resources (W2R) Program implements many aspects of the solid waste portion of the State Plan, and coordinates with the Hazardous Waste and Toxics Reduction (HWTR) Program on other portions of the plan. Implementation of the State Plan includes:

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

- Convening the commingled recycling workgroup in the northwest region of Washington.
- Updating the solid waste handling rule, Chapter 173-350 WAC.
- Working to reduce wasted food.

- Continued research on organics "waste to fuels."
- Working with stakeholders across the state to reduce contamination in collected organics.
- Improving our data and performance indicators.
- Collection of waste electronics and mercury-containing lights through the state's two product stewardship programs.
- Coordinating with Department of Enterprise Services to provide environmentally preferred purchasing options for state government.
- Technical assistance for facilities to provide safe recycling and disposal.

More information about some of the work mentioned above can be found in other sections of this report.

To be kept informed about the State Plan, join the listserv or visit the plan website at www.ecy.wa.gov/wasteplan.

Regulatory Changes in Washington

Solid Waste Handling Standards Rule Update

In November 2013, the W2R Program formally announced it would update *Chapter 173-350 WAC – Solid Waste Handling Standards*. Sections of the rule pertaining to organics management (220, 225, and 250) were adopted in spring 2013 following a process that began in 2009. In 2010, an update of the whole chapter was put on hold under former Governor Christine Gregoire's Executive Order restricting agency rulemaking. Only the organics sections moved forward. The new update will focus on the remaining sections of the rule. Ecology is not proposing further amendments to the organics sections at this time.

Ecology will revisit issue papers and summaries developed previously, and renew efforts to work with stakeholders. Initial priorities include updating definitions; clarifying criteria for inert waste classification and when earthen material/soil is a solid waste; and streamlining recordkeeping and reporting requirements. In this general update, Ecology will address other issues that may result in substantive changes, as well as clarifications and corrections to language in the chapter not expected to change the overall effect of the rule.

Local health authorities (LHA) adopt ordinances that meet or exceed state program requirements, and have the lead for implementing the requirements of state solid waste rules through local permitting processes. Solid waste management is largely a partnership between public agencies and the private sector. Operators are a mixture of public (mainly public works departments) and private (haulers, recyclers, disposers) interests.

Ecology will solicit and evaluate recommendations of ad hoc committees comprised of internal staff and stakeholder representatives, and solicit feedback through both informal and formal public processes. Ecology will involve stakeholders by keeping them informed using various communication tools including email, newspaper notices, notices to trade journals, a website with rule update information, notices on the agency public events calendar, notices sent through the WACTrack ListServ, and informal and formal stakeholder meetings and hearings. We will also periodically brief the Waste 2 Resources Advisory Committee and statewide environmental health directors.

At this early stage, it is difficult to project dates with great confidence. Following is a proposed timeline:

Rulemaking announcement (CR-101 filing)	November 6, 2013
Informal Public Meetings	September 2015
Proposed rule available for public comment (CR-102 filing)	June 2016
Final rule adoption (CR-103 filing)	November 2016
Rule effective date	December 2016

Encouraging Producer Responsibility in Washington

Mercury-Containing Lights Product Stewardship Program

The 2010 Legislature adopted *Chapter 70.275 RCW, Mercury-Containing Lights - Proper Disposal.* The law requires producers of mercury-containing lights sold in or into Washington State for sale at retail to fully finance and participate in a take-back program. Ecology formally proposed new rules for the product stewardship program in March 2016 and held a public hearing in April. The rules will be adopted after comments are addressed and the rule process is complete.

The industry proposed new legislation for the 2014 Legislative Session to eliminate the state contracted program and allow for producer funding options to include an environmental handling charge applied to each bulb sold at retail. The Legislature approved EHSB 2246 and the Governor signed it in March 2014. *Chapter 70.275 RCW* was updated in June 2014 with the new legislation in EHSB 2246.

LightRecycle Washington is the mercury-containing lights product stewardship program "brand." The LightRecycle Washington program became operational on January 1, 2015.

The program's status will be regularly updated on Ecology's website. Additional information is available:

- LightRecycle Washington website: http://www.lightrecyclewa.org/
- Ecology website: http://www.ecy.wa.gov/programs/swfa/mercurylights/
- Ecology publication: https://fortress.wa.gov/ecy/publications/publications/1207064.pdf

Chapter 2: Partnering for the Environment

Building strong partnerships underlies the success of Ecology's Waste 2 Resources (W2R) Program. The W2R Program encourages 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.

Optimizing Commingled Residential Curbside Recycling Systems in Northwest Washington

Following up on the 2010 report *Beyond the Curb - Tracking the Commingled Residential Recyclables from Southwest WA*, similar stakeholder work began in the northwest region. Multiple industry and public sector partners came together to identify ways to optimize the commingled residential curbside recycling systems in the northwest region of Washington State.
Over three years, these partners worked to improve the quality and quantity of recyclable materials in those programs. This new report is set to be released in 2016 and will be posted on the Northwest Regional Workgroup's website when it is complete at http://www.ecy.wa.gov/programs/swfa/commingled/nw.html.

The goals of the report are to identify ways to optimize residential commingled curbside recycling programs and support effective processing systems for recyclable paper, packaging, and other materials to:

- Provide customer, environmental, social, and economic benefits.
- Result in quality materials for return to commerce.
- Ensure public confidence in the recycling system.
- Provide ease of use for residents.

What are the Issues?

Washington used to collect residential recyclables at the curb through a variety of methods. The three-bin sorting system was the first. While still in use in one area of the state, this method declined in the early 2000s as all-in-one cart commingled systems increased in Washington. More than 85 percent of Washingtonians have access to curbside recycling, and the vast majority use commingled system.

There are two types of commingled recycling collection systems: single stream and dual stream.

- Single stream is the most common. It means that residents are given one cart and all accepted materials go into it.

- Dual stream could mean that residents get two carts: one for glass and one for all other materials.

The challenge with a commingled collection system is differing recyclables are mixed together and must be separated to sell back to manufacturers to make new products and packaging.

Commingled collection systems are here to stay - that is not in question. The question is how can we improve them so that higher quality materials enter the Material Recovery Facilities (MRF), and in turn result in more materials sent to the intended manufacturers - where the actual recycling occurs.

Benefits of a Commingled System

For a collection system, there are many benefits for choosing an automated, single-cart approach. Reduced worker injuries and more efficient route times mean lower costs for collection. The trucks can compact all of the materials together, rather than having to leave the route to empty the entire truckload when only one material type has reached capacity in the truck. Because there is less or no sorting by residents, there is increased participation. In addition, the increased capacity of the cart allows for higher collection volumes and the ability for programs to add materials without having to invest in more bins. Automated carts have a lid and wheels which improve public convenience and privacy, and prevent material from blowing out of the bins. They also keep pests from getting in and keep materials drier, making them easier to process and worth more in the marketplace.

Limitations of a Commingled System

The major limitation of a commingled recycling system is that which is mixed together must then be separated. Many of the benefits on the collection side of the system can cause problems for the processor, and in turn the end-use manufacturers. Some materials like glass, plastic film, and flattened containers are difficult to separate once mixed together, and can cause cross-contamination of other materials (usually paper) and problems with equipment. The increase in collection volumes and participation can overwhelm the processing system, causing cross-contamination, an increase in non-program materials, and ultimately "lost" recyclables. There also tends to be lots of variation in what is collected across jurisdictions, causing confusion for residents and making it more difficult for processors to rely on a consistent mix, which aids in sorting.

The savings achieved from the automated collection system result in higher shifted costs to the processors and mills. It is more labor intensive to sort and produces a lower quality material. The capacity, shape, and privacy of the cart might lead residents to use the recycling cart for excess garbage. Because carts offer increased capacity, many jurisdictions that switch to commingled carts will often reduce garbage service to every-other-week, exacerbating the dumping issue - an unintended consequence. Residents often hold the belief that everything can go in the recycling cart, and it will get

sorted and recycled. Also, mistakes can be made due to the visual similarity of garbage and recycling carts. Either way, direct feedback to the resident is much more difficult with an automated collection system.

Reducing Small-Volume Hazardous Materials and Wastes (Moderate Risk Waste)

Because of their pervasiveness and potential harm, reducing small-volume hazardous materials and wastes is a primary initiative of the Waste 2 Resources Program. The goal is to eliminate risks associated with products containing hazardous substances commonly used in households and in relatively small quantities by businesses. The state classifies this type of hazardous waste as moderate risk waste (MRW). For more information, see Chapter 5.

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. While several counties recently initiated new facility development, a majority of programs focus on operational issues, such as adapting to an evolving waste stream and securing necessary funding.

Ecology conducts many activities to ensure the proper management of MRW. Regional staff review and support implementation of local solid and hazardous waste plans. They provide technical assistance on regulatory compliance to local solid waste and health departments and facilities. They also administer grant programs that support MRW activities at the local level.

Collecting, processing, and disposing of MRW is expensive. Ecology, in partnership with local governments, has been exploring product stewardship and extended producer responsibility as a way to ease the financial burden of managing these wastes.

“Product stewardship” directs all those involved in the design, production, sale, and use of a product to take responsibility for minimizing the product's impact to human health and the natural environment throughout the entire life of the product. Extended producer responsibility is a mandatory type of product stewardship (often legislated) that at a minimum includes the requirement that producers take responsibility for establishing and financing a system to recover their products at their end-of-life.

Not only does product stewardship and extended producer responsibility shift the burden of end-of-life management from local governments to product manufacturers, it increases recycling of products, which reduces waste and conserves resources.

Ecology is currently responsible for implementing two extended producer responsibility laws: E-Cycle Washington for electronics and LightRecycle Washington for mercury containing lights. In the 2016 Legislative Session, the paint industry brought forth legislation to create product stewardship programs for their product. Although it failed for the fourth year in a row, the paint bill is expected to be reintroduced in 2017.

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. Ecology is engaged in activities to eliminate use of toxic substances in products, making products "greener," thereby preventing the generation of small volume hazardous wastes in the first place. Most of these activities are carried out by Ecology's Hazardous Waste and Toxics Reduction Program.

Reducing risks from MRW goes beyond safe handling and disposal. It is optimizing reuse and recycling. Ultimately, it is eliminating use of toxics in products and increasing use of safer products and services.

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).[1] 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. As of 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 Ecology's approval.

The Standard Plan (the default recycling 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 seven years of program operations (2009-15), all manufacturers participated in the Standard Plan administered by WMMFA. Independent manufacturer plans were proposed in 2009 and 2010, but Ecology could not approve them due to insufficient collection networks.

[1] *Chapter 173-900 WAC, Electronic Product Recycling Program* specifies 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).

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 E-Cycle Washington Program exceeded all predictions by recycling *38.5 million pounds* of TVs, monitors, and computers. Over the years, annual collections grew. 2015 was the seventh year of program operations, and the public continues to bring large volumes of electronics to E-Cycle Washington for safe and responsible recycling.

Table 2.1
E-Cycle Washington Collections 2009-15

	Pounds Collected (Millions)
2009	38.5
2010	39.5
2011	42.2
2012	43.5
2013	45.2
2014	44.4
2015	42.6

- In mid-2011, the E-Cycle Washington Program achieved the ***100 million pound*** milestone for electronics recycled. In 2011, Ecology also expanded the scope of products covered by the program to include tablet computers and electronic book readers, also known as e-readers.

- In 2014, the E-Cycle Washington Program topped the **one-quarter billion** (250 million) pound mark.

- Washington is a national leader in recycling electronics, with a 6.17 lbs/capita average over the seven-year history of the E-Cycle Washington Program.

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

- Seven 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 reported that over the first seven years of participation in the program, approximately 300,000 working units received through the E-Cycle Washington Program were sold for reuse.

E-Cycle Washington Website

The website developed for the Electronic Product Recycling Program continues to provide up-to-date, 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 in 2008. 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 continue to be distributed at events and fairs, and through mailings. In addition, promotions for E-Cycle Washington have appeared in various publications (several in Spanish) and online advertisements, as inserts in utility bills, on buses and ferries, and on billboards on Interstate 5 and many other locations throughout the state.

Ecology continues to work with retailers of electronics, encouraging them to provide consumers with information about the E-Cycle Washington Program when new electronics are purchased. WMMFA sponsors radio and TV ads across the state to inform the public about the free program for electronics recycling.

Stakeholder Concerns

Due to the strong public demand for recycling opportunities for more electronic products, Ecology is working with stakeholders to gain support for legislation to expand the scope of products covered by the E-Cycle Washington Program. Legislation could propose to add computer keyboards and mice; external hard drives; printers; video game consoles; video cassette recorders/players (VCRs); digital video recorders (DVRs); and digital video disc players (DVDs).

Mercury-Containing Lights Product Stewardship

The mercury-containing lights law (Chapter 70.275 RCW) requires a fully financed producer product stewardship program for the collection, transport, and recycling of mercury-containing lights. Safely collecting and recycling mercury-containing lights are important for the following reasons:

- Mercury is a toxic metal that accumulates in our bodies and the environment.
- When mercury-containing lights are broken, mercury is released into the environment.
- Use of mercury-containing lights has increased, because they are energy efficient.
- A safe way to collect and recycle these lights is needed.

The program passed some milestones this year:

- The program was operational on January 1, 2015 and started with 191 collection sites. As of December 31, 2015 there were 285 collection sites: 217 that accept all program products and 68 that accept CFLs only. The program will continue to add collection sites to increase convenience for the public to recycle lights.
- As of December 31, 2015, LightRecycle Washington had recycled 989,034 lights and kept more mercury out of the environment.
- PCA Product Stewardship Inc. (PCA) was chosen by industry to implement the Program. Ecology has oversight and enforcement responsibilities.
- Ecology approved the LightRecycle Washington Mercury-Containing Lights Product Stewardship Program Plan in December 2014 (see http://www.ecy.wa.gov/programs/swfa/mercurylights/). The plan identified 96 collection sites around the state that would collect all products and 62 sites that would collect CFLs only.

Mercury-Containing Lights Product Stewardship Program

Ecology approved the *Program Plan* for the Washington State Mercury-Containing Lights Product Stewardship Program (see www.ecy.wa.gov/programs/swfa/mercurylights/).

The Plan establishes a "comprehensive, safe, and convenient collection system" in Washington that includes retail locations, existing residential curbside, and mail-back collection systems. The program accepts end-of-life mercury-containing lights from single-family and multi-family household generators, and persons (including businesses) that deliver no more than 10 mercury-containing lights per day to

retail and HHW registered collectors, and 15 lights per day to registered residential curbside collection programs. This program is reducing the improper disposal of spent mercury lighting. Without proper management, spent lighting will release mercury that threatens human health and the environment.

The Plan estimated the collection and recycling of nearly one million mercury-containing lights during the first year of operation. Results of program operations will be reported to Ecology each year by June 1. Annual reports will be posted online at www.ecy.wa.gov/programs/swfa/mercurylights/.

Program Operator

The LightRecycle Washington Program is managed and operated by PCA Product Stewardship Inc. (PCA). PCA specializes in the management and recycling of mercury-containing lights and tubes. EcoLights is the only licensed "final destination" lamp recycler in Washington and the largest in the Pacific Northwest. Peter Thermos is the Program Manager for LightRecycle Washington (peter@lightrecyclewa.org; Program website: www.lightrecyclewa.org).

Collection Service

LightRecycle Washington uses a network of permanent, year-round locations for the collection of program products. There is no charge to drop off up to 10 lights per day. Any organization interested in joining the program as a collection site should contact Peter Thermos.

Collection sites include retailers, recycling organizations, and businesses (both nonprofit and for profit); local government Household Hazardous Waste (HHW) or Moderate Risk Waste (MRW) collectors; local government recycling centers; solid waste curbside programs; transfer stations; and other associations or businesses interested in participating in the program, including any other locations which currently collect mercury containing lights. The list of collection sites will be provided on the LightRecycle Washington website (http://www.lightrecyclewa.org/).

Program Startup

The LightRecycle Washington Program was operational on January 1, 2015. For updates related to this program, please see www.ecy.wa.gov/programs/swfa/mercurylights/.

Where to Recycle Lights Today

Washington State law (RCW 70.275.080) prohibits the disposal of mercury-containing lights by any Washington State resident, business, or entity, effective January 1, 2013. Mercury-containing lights must be recycled. See the following information to locate a collection site near you:

- LightRecycle Washington: LightRecycle Washington website. The network includes locations for recycling CFLs, linear tubes, and HID lights throughout Washington State.

- Department of Ecology: 1-800-RECYCLE database. Fluorescent lights are listed under the Household Hazardous Waste category.

- Puget Sound Energy (PSE): PSE maintains a network of participating locations that collect Compact Fluorescent Lights (CFLs) at no charge.

- Take it Back Network: This group of retailers, repair shops, nonprofit organizations, waste management professionals, and recyclers offers options for recycling certain products that should not be disposed of in the trash. The network includes locations recycling CFLs, linear, and HID lights in Snohomish, King, and Pierce counties.

- Ecology website: http://www.ecy.wa.gov/programs/swfa/mercurylights/.

- Ecology publication: https://fortress.wa.gov/ecy/publications/publications/1207064.pdf.

- Earth911.com: Nationwide database for a variety of recyclable materials.

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 more than $4 billion in purchasing power to buy products and services that:

- ✓ Reduce greenhouse gases.
- ✓ Conserve energy and water.
- ✓ Reduce the amount of toxics in products and promote safer chemical alternatives.
- ✓ 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 Solid and Hazardous Waste Plan (formerly known as Beyond Waste) encourages state government to increase purchases of environmentally preferable goods and services. Ecology's environmentally preferable purchasing (EPP) team includes staff from the W2R and Hazardous Waste and Toxics Reduction (HWTR) programs, Ecology's Purchasing Office, and the Headquarters Operations Manager. The team helps state agencies meet the EPP goals outlined in legislation and Executive Order.

Ecology provides technical assistance to local governments and businesses that want to establish or expand their EPP programs. By promoting safer products and services, EPP supports Ecology's key initiatives on reducing toxic threats, saving Puget Sound, and facing climate change.

Laws and Directives

Implementing PCB state purchasing law

In 2014, the Legislature directed state agencies to stop purchasing goods that contain polychlorinated biphenyls (PCBs) in RCW 39.26.280. The bill also directs the Department of Enterprise Services (DES) to establish a policy that provides a preference for products and product packaging that do not contain PCBs. The policy will state that no agency may purchase products or products in packaging containing PCBs above the practical quantification limit unless the purchase is not technically feasible or cost effective.

In 2015, DES and Ecology facilitated a stakeholder group of state and local government representatives to discuss how to write an effective policy and identify the most important products that state agencies purchase that may contain higher levels of PCBs. Tests of 68 consumer products confirmed that polychlorinated biphenyls (PCBs) are present in commonly used items. Full details, including a complete product listing, are available in a report on Ecology's website.

Greening State Contracts

State government is also directed through Executive Orders 02-03 and 5-01 to lead by example in environmentally preferable purchasing. Agencies are directed to:

- ✓ Increase purchases of environmentally preferable products to help expand markets.
- ✓ Reduce energy use.
- ✓ Reduce greenhouse gas emissions.
- ✓ Reduce water use.
- ✓ Institute green building practices.

In 2015, Ecology collaborated with unit managers in the Contracts Division of DES to map a process for incorporating green specifications in bid development processes for state contracts. Ecology will participate in stakeholder groups for several contracts including architectural paint, food, commercial appliances, furniture, and carpet and flooring.

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 and local governments buy goods and services through state contracts, agency contracts, and cooperative purchasing programs. Ecology provides training and technical assistance to purchasing, facilities, and sustainability staff at government agencies to help them identify and purchase EPP products. In 2014, the EPP Team responded to more than 30 technical assistance requests from state agencies, local governments, businesses, and other entities.

In 2014, Ecology participated in the Government Purchasing for Climate Protection Workgroup of the EPA West Coast Climate and Materials Management Forum. As discussed in EPA's Opportunities to Reduce Greenhouse Gas Emissions through Materials and Land Management Practices, the full lifecycle emissions associated with waste, materials, and products contributed 42 percent to the U.S. greenhouse gas inventory in 2006. These impacts are much larger than recognized by most conventional greenhouse gas inventories. Ecology participated in drafting a web-based toolkit that will be published in 2016 that offers strategies and resources for local governments to reduce greenhouse gas emissions through climate-friendly procurement.

Ecology's Buy Green, Save Green website highlights how local and state governments are saving money by purchasing green products (see http://www.ecy.wa.gov/programs/swfa/epp/. The website offers the following updated information:

- ✓ How to save money while purchasing greener electronic products, cleaning products, facilities management products, lighting, office products, paint, vehicles, and automotive products.
- ✓ The *Who is Buying Green* section offers highlights of local, state, and federal agencies that are creating EPP policies, writing annual EPP reports, and offering guidance on how to buy green. If an agency wants to be included on this webpage, please contact Tina Simcich at tina.simcich@ecy.wa.gov.

- ✓ How to identify rigorous environmental performance levels using standards and certification programs.
- ✓ EPP related laws and directives in Washington State.
- ✓ Resource guides on starting an EPP program, life-cycle assessment, and green meetings.

If you are interested in keeping up to date with developments in green purchasing, join Ecology's Green Purchasing listserv at http://www.ecy.wa.gov/programs/swfa/epp/.

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 environmental 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 extraction, to manufacturing, to end-of-life.
- 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, non-profit organizations, and academia) or other rigorous process to develop standards.
- Provide transparency 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 Policy 13-04 on EPP to align with agency priorities on climate change, reducing toxic threats, and resource conservation. The EPP policy applies to development of agency grants and contracts. Ecology's actions will also help address the Governor's mandate that Ecology lead the way in moving state government to carbon neutrality.

Recycling and Beneficial Use of Organic Materials

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

Waste to Fuels Technology

Beginning in 2006 (and continuing to date), the Washington State Legislature directed Ecology and Washington State University (WSU) to form a Waste to Fuels Technology (WTFT) partnership, and use funds to investigate methods of recovering the organic fraction of solid waste for fuels and valuable secondary products. Ecology's report No. 16-07-008, *Advancing Organics Management in Washington State: The Waste to Fuels Technology Partnership*, presents extensive work completed by the WTFT project in the 2013-15 Biennium. This report is the summation of a set of projects to research higher value processes to conserve valuable organic resources that continue to be disposed to landfills or incinerated, or which may currently be composted.

The partnership focused on biorefinery processes that can be co-located at compost facilities including anaerobic digesters (AD) to produce methane; recover fertilizer from liquid digestate and co-compost separated AD solids; pyrolysis or gasification for combined heat and power and biochar (CHPB) and co-composting biochar; scrubbing H_2S from biogas with biochar; and designer biochar for water retention and fertilizer recovery.

Figure 2.1
Conceptual Biorefinery at a Compost Facility

Models were constructed to assess biomass flow with mass balance equations, coupled with economic models which included capital, operating, and maintenance costs, and revenue. A base case model of a 160,000 t/yr compost facility demonstrated 14 percent return on investment (ROI). When modeling was completed on added process units including a 120 t/d food scrap AD, pyrolysis, and wood pellet production unit, the economic model results showed improved ROI of 34 percent for AD, a range of 21 to 46 percent for optional electrical power and heat production with biochar from pyrolysis, and 88 percent for wood pellet production. While these models are prefeasibility level, the results demonstrate significant economic opportunity for the organic industry. Although the models did not specifically conduct a lifecycle assessment, an expected additional benefit is a significant decrease in greenhouse gas production, and improving carbon sequestration of overall organics recovery processes for AD and pyrolysis combined with composting.

Engineered biochar was evaluated for its ability to act as a biofilter (similar to activated carbon) for removing hydrogen sulfide gas from AD biogas. This was demonstrated to be effective. When used as a soil amendment, oxidized biochar retained more water, dramatically improving the soil's water holding capacity. These studies showed that the surface charge on biochar was a critical parameter controlling the adsorption of *Escherichia coli*. The positive charges on the surfaces of oxidized biochar adsorbed the negatively charged bacteria.

A process using magnetic particles to more readily separate high value anti-oxidant polyphenols from grape pomace was successfully demonstrated. A survey of the organics industry (largely compost producers) was also conducted to assess the industry's understanding of the potential to apply these research outcomes for creating additional commercial opportunities. Largely, the industry is unaware and unprepared to take on these profitable new opportunities. Lastly, WSU has focused on extensive education and outreach to the industry to support profitable commercialization using waste organic resources for fuels, fertilizers, soil amendments, and high value.

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. We continue to work with state government to suggest changes to compost specifications and purchases made by government agencies. Several fact sheets are available on Ecology's Compost and Healthy Soil web page under the "Tools" section. The fact sheets, including one on Buying and Using Compost, increase awareness of the benefits of using compost.

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 on Ecology's Compost and Healthy Soil web page under the "Tools" section. The fact sheets (including one on Building Healthy Soil) increase awareness of the benefits of healthy soil**.**

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. Members include compost facility owners and operators, local and state government representatives, and others with an interest in organic materials management.

Since 1995, WORC has offered Compost Facility Operator Training (CFOT). This training is an approved training required by our state composting rule (WAC 173-350-220). It provides an invaluable opportunity for students and instructors to learn and share ideas on proper operation and regulation of compost facilities in Washington. Students from around the region and beyond gather for one week of lecture and hands-on training at the Washington State University (WSU) Puyallup Research Station. More than 640 students have completed CFOT. Instructors consist of Ecology and WSU staff, compost engineers/consultants, and compost facility operators.

The 2015 training was held October 19-23 with 40 students, 5 core instructors, and 20 guest presenters/panelists. It is the only training of its kind in the state and surrounding area. The training included lectures, panels, fieldwork, and field trips. Presentations covered odor control, facility design, soil biology, and more. In addition to classroom lessons, students received hands-on experience building their own compost piles and evaluating pre-built piles. They learned safe, effective ways to make compost from a multitude of feedstocks.

Students learned current compost science. This included how to make and manage compost piles. They learned 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. They also learned how to sample, market, and use compost.

Tours included Lenz (Stanwood), Bailey's (Snohomish) and GroCo (Kent). In the classroom, students learned from experts on three panels (compost operators, compost end-users, and regulators). These tours and panels provided students with the opportunity to learn directly from people responsible for making and using quality compost.

Student learning was measured by comparing the quiz on day one with the final day. The average score went from failing (32 percent) to passing (88 percent). The more comprehensive final exam consisted of 46 questions with an average score of 88 percent. All students received a passing score on the exam and received a certificate of achievement. Upon successful completion of this training, students are eligible for continuing education credits (CEUs), including 2.9 CEUs toward Ecology's Wastewater Operator Certification Program.

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

Commercial composting is one of the key elements in the closed-loop organics recycling system. Compost facilities that process organic materials 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.

Washington State's law on solid waste handling, recovery and recycling is Chapter 70.95 RCW, Solid Waste Management – Reduction and Recycling. It was created to prevent land, air, and water pollution, and conserve the natural, economic, and energy resources of the state. Chapter 173-350 WAC, Solid Waste Handling Standards, was written to implement the law and contains specific requirements for organics and other solid waste management.

For information on Washington State's composting rule (WAC 173-350-220), see http://www.ecy.wa.gov/programs/swfa/organics/law.html.

In 2014, Washington State had 65 composting facilities operating with a solid waste handling permit or conditional exemption for a solid waste permit and/or biosolids permit. This is an increase of six facilities compared to 2013. These composting facilities reported **1,167,011 tons** of material composted in 2014. This was down 48,184 tons from 2013. Table 2.2 highlights the variety of materials composted.

We observed significant changes in feedstock amounts (in tons) when comparing 2014 to 2013 reports. Yard debris had the largest decrease (>67k tons). The largest increase was post-consumer food (>35 tons). Other food categories included food/yard debris (>1k ton increase), food processing (>8 ton decrease), and preconsumer food (231 ton decrease).

Food was composted at 25 facilities throughout the state (up from 22 in 2013). Of these facilities, 13 accepted pre-consumer food (down from 14), 5 accepted food processing waste (down from 6), 10 accepted post-consumer food (up from 8), and 4 accepted mixed residential yard/food scraps (down from 8).

Washington State composting facilities reported 1,015,234 cubic yards of compost produced (>144k cubic yard decrease). The amount of material reported as hog fuel was almost 6,859 tons (>43k ton decrease). Three facilities that reported a total of >30k tons hog fuel in 2013 did not report any hog fuel in 2014.

Table 2.2
Organics Recovery Comparison (Tons)

	2013	2014
Composted		
Agricultural (includes crop residue)	59,679	37,660
Yard debris with food (mixed residential)	240,539	241,792
Food, all other (pre/post/processing)	178,047	207,757
Land clearing debris	128,958	116,603
Yard waste	424,765	357,569
Wood waste, all other	46,423	66,685
Other materials composted *(other agricultural waste, biosolids, cardboard, industrial organics, manure, mortalities/animal parts)*	136,783	138,946
Total materials composted	**1,215,195**	**1,167,011**

Ecology continues to work with WSU 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.

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). Anaerobic digesters, both on and off dairies, may also operate under a solid waste handling permit if they do not meet the conditions for exemption. Both the exemption and permitting criteria are addressed in detail in the Solid Waste Handling Standards (Chapter 173-350-250 WAC). These digesters must obtain and comply with other applicable state and local permits.

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 spreading manure (or *nutrients* as some farmers like to say), effectively fertilizing the land 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 creates 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. The U.S. Environmental Protection Agency (EPA) estimates 200 of the 65,000 dairy farms in the U.S. use manure digesters (for more information, see the EPA's AgSTAR website at www.epa.gov/agstar/projects/index.html). The Climate Action Team Study estimated that 135 of the 500 dairies in Washington could manage manure in an anaerobic digester (dairies with more than 500 cows).

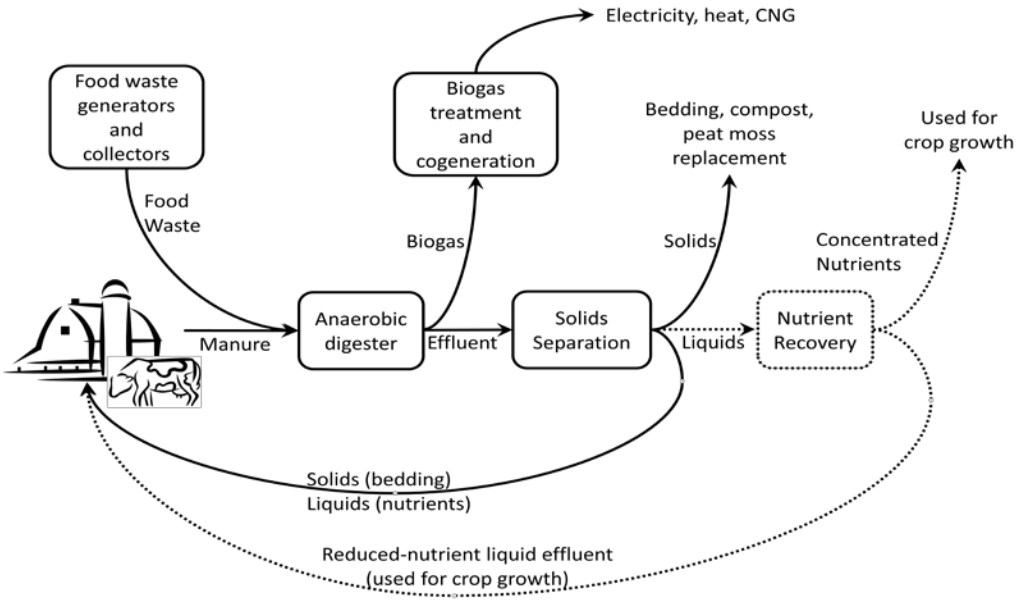
Manure digesters in Washington are either concrete structures or metal tanks built to hold manure at roughly 100°F. Dairy manure is piped or trucked to the digester, where it is often mixed with other organic materials like chicken, seafood, fruit, or food processing wastes. One of these operating digesters can take in more than 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 digester and a pipe delivers the biogas for further processing. Biogas can be scrubbed to meet quality standards and fed into natural gas pipelines, compressed into a liquid fuel for trucks, or fed into 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 much of this methane and reduces greenhouse gas emissions from dairy operations.

Waste heat from the engine can be used to keep the digester warm and can offset fuel purchases on the farm. Excess electricity can be sold back to the local utility. After digestion is complete, 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, or utilized by plant nurseries for potting soil mixes. Liquid digestate is returned to the dairy manure lagoons for storage and later used as fertilizer in much the same way as the unprocessed manure had been.

Figure 2.2
Dairy Anaerobic Digester Schematic
(Graphic Courtesy of WSDA)



Dairy Digesters in Washington

Today, a double handful of dairy farms in Washington use anaerobic digesters to put their cow manure to work generating renewable energy. Table 2.3 summarizes the energy produced by co-digesting manure and organics in the dairy digesters. The 29,324 megawatt-hours (MW-h) produced in 2012 is enough electricity to power 2,250 average homes in Washington.

The Washington State Department of Agriculture (WSDA) continues to oversee dairy manure management as required under the Dairy Nutrient Management Act (Chapter 90.64 RCW). The W2R Program and WSDA Dairy Nutrient Management Program collaborate on inspections, record reviews, and annual reports. At the end of each calendar year, digester operators report some information to

W2R. Table 2.3 lists the energy produced and gallons of manure and organics digested by the permit exempted digester operations. Table 2.4 lists the active dairy digesters in Washington. Map 2.A shows where these dairy digesters are located around the state.

Table 2.3
Dairy Digesters Total Manure and Organics Processed

Calendar Year	Number of Digesters	Energy Produced (MW-h)	Manure Digested (million gallons)	Co-digested Organics (million gallons)
2009	3	7,536	44.2	9.5
2010	4	18,451	99.9	16.9
2011	6	25,311	150.6	19.7
2012	8	29,324	164.0	23.8

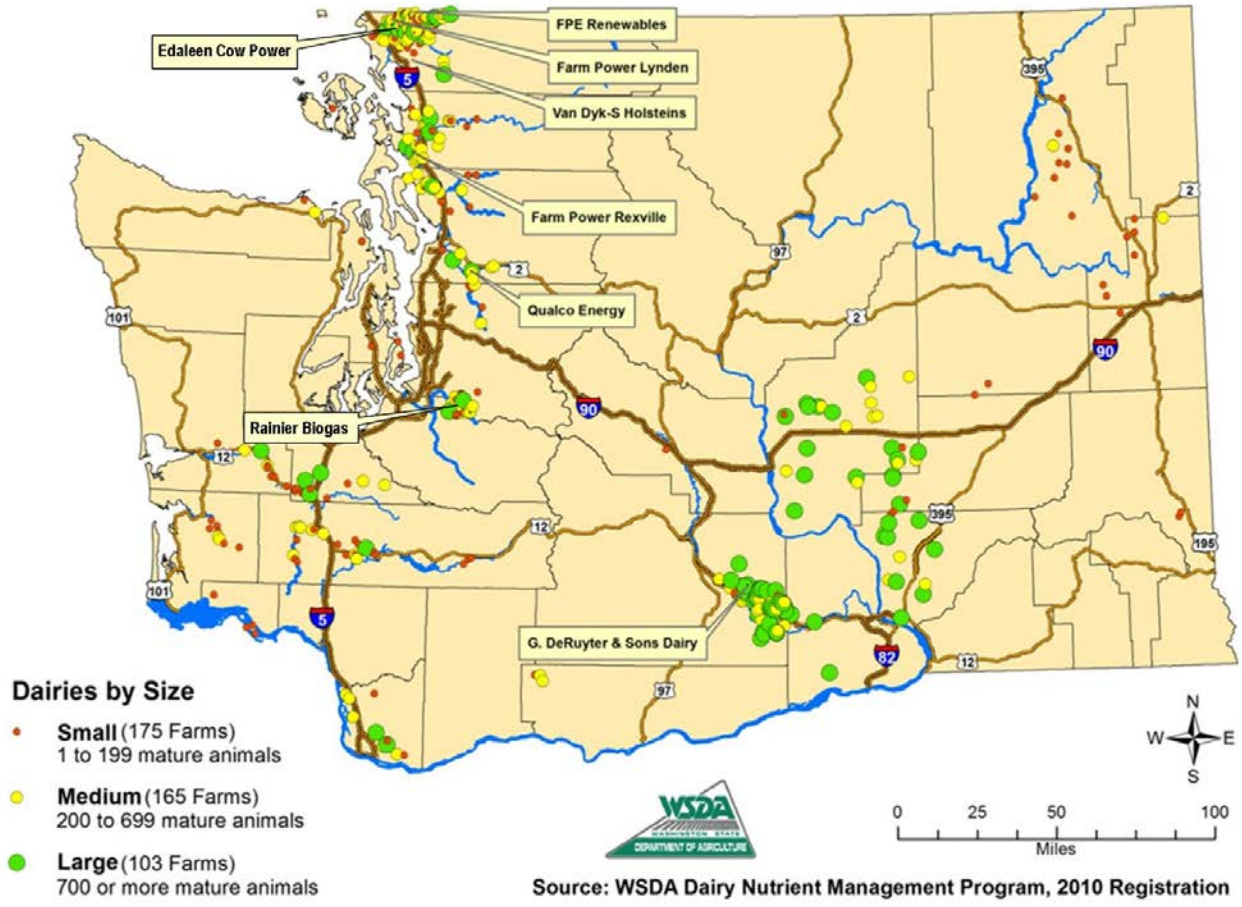
MW-h = megawatt-hours

Table 2.4
Washington Dairy Digesters

Digester	City County	Startup Year	Participating Dairies	No. Cows	Generator (kW)	Utility
FPE Renewable	Lynden Whatcom	2004	Vander Haak, Dee Bee Jersey farms	1,100	600	PSE
DeRuyter	Outlook Yakima	2006	DeRuyter & Sons	5,300	1,200	PacifiCorp
Qualco Energy	Monroe Snohomish	2008	Werkhoven	1,100	450	PSE
Farm Power Rexville	Rexville Skagit	2009	Beaver Marsh & Harmony	1,200	750	PSE
Farm Power Lynden	Lynden Whatcom	2010	MJD Farms	2,000	750	PSE
Van Dyk-S Holsteins	Lynden Whatcom	2011	Van Dyk-S Holsteins	1,000	400	PSE
Edaleen Cow Power	Lynden Whatcom	2012	Edaleen Dairy	1,700	750	PSE
Rainier Biogas	Enumclaw King	2012	Wallin; DeGroot Brothers; Ritter Dairies	1,200	1,000	PSE

PSE - Puget Sound Energy
kW – kilowatt

Map 2.A
Washington State Dairy Digesters



Beyond Waste Performance Indicators (aka the "Progress Report")

Ecology's W2R and HWTR programs work together to update and improve a series of indicators that track progress toward the State Plan goals. We are continuously improving our measures of Washington's success at reducing use of toxic substances, and the generation of solid and hazardous wastes. Ecology is also addressing the broader themes of the State Plan by developing and maintaining indicators that show how our progress toward these goals relates to economic and environmental vitality.

The State Plan Progress Report (http://www.ecy.wa.gov/wasteplan/progressReport.html) was first published in 2007 with eight indicators. 2015 marks the eighth update of the report, which now contains 18 indicators, with multiple views, such as tons and per capita, recycling rate comparisons, and material-specific analysis. Trend analysis is provided for most indicators, with data going back to 2000 for many indicators, and back to the early 1990s in some cases.

The indicators track progress toward the State Plan sections – Managing Hazardous Waste & Materials, Managing Solid Waste & Materials, and Reducing Impacts of Materials & Products, as well as progress toward overall goals of reducing waste and toxics.

The report was restructured based on the new sections of the 2015 State Plan Update. Ecology will continue to implement changes as possible and update the individual indicators when data is available. 2015 marks the fourth year of this page-by-page type of update.

Some changes that Ecology implemented in 2015 or are currently under development include:

- Simplified view – see all indicator titles at a glance on the front page of the Progress Report (no scrolling or hovering).
- Shift to using government "open data" (data.wa.gov) to post datasets and graphs.
- Provide more charts and comparisons for context, such as per capita data.

The indicators show that we are making significant progress in some key areas. Although the overall recycling/diversion rate dipped for the second year in a row from 2012 to 2013, the 5-year trend still shows an increase. Washington is among the top states in diverting recyclables from landfills, with a 51.4 percent recycling and diversion rate. We are also collecting more electronic wastes for recycling (Figures 2.3 and 2.4), another positive trend.

Figure 2.3

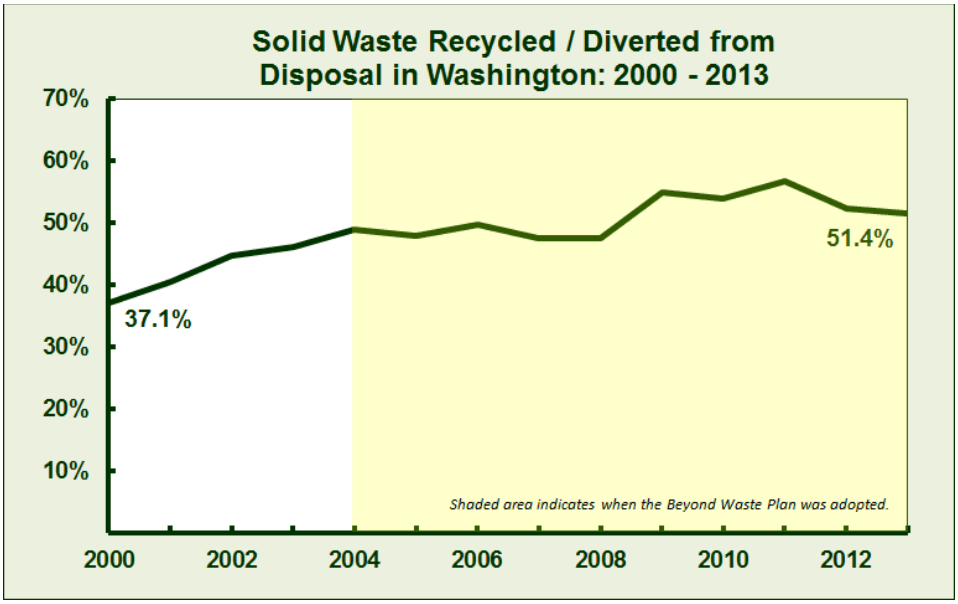
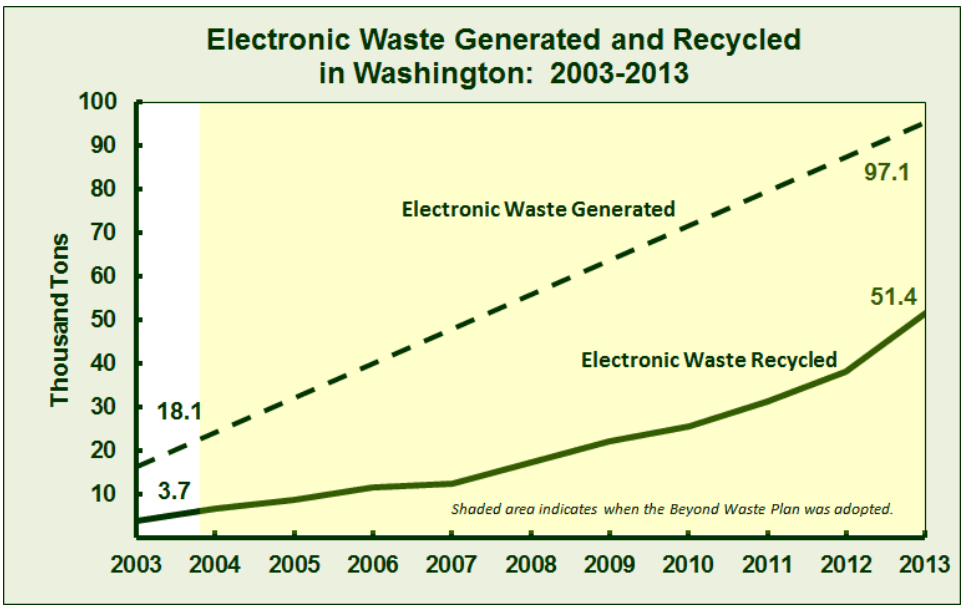
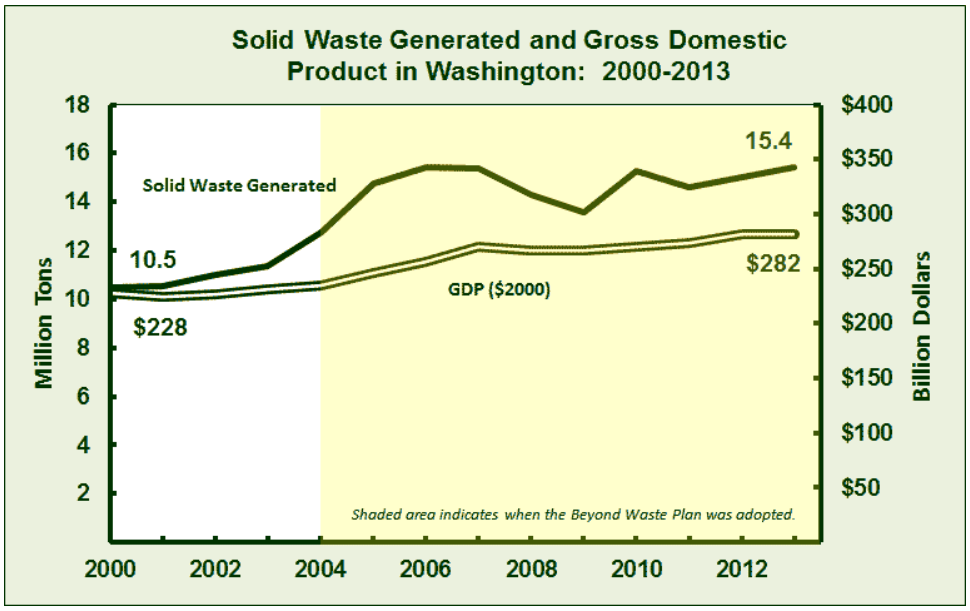


Figure 2.4



Some trends are disappointing. Despite our recycling efforts, in 2013 we generated more waste per dollar spent (Figure 2.5).

Figure 2.5



Good news includes the index for toxic release risks from manufacturers is declining.

To see the full Progress Report, including detailed information about each indicator, see http://www.ecy.wa.gov/wasteplan/progressReport.html.

Waste Tire Prevention

Waste tires removed from Kitsap County in 2012

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.

Waste Tire Removal Account (WTRA) funding, created in 2006, is used to prevent and remove illegal tire piles. Funds in this account come from a $1 fee added to new replacement tires sold in Washington. These funds are used for agency costs and waste tire projects around the state.

Table 2.5 details the use of Waste Tire Removal Account funds from 2007-15. Efforts funded from 2007-10 focused on removal of more than 175 unauthorized waste tire piles around the state. In 2010, the WTRA funding for Ecology was reduced to $1 million per biennium. Since 2011, the funds have been used for removal of tire piles and amnesty efforts. Tire amnesty events generally consist of scheduled dates in a community when residents can drop off tires at no charge.

Table 2.5
Waste Tire Cleanups

Year	Tons of Tires	Dollars
2007	32,671	$4,300,079
2008	8,112	$1,882,295
2009	11,608	$2,617,249
2010	3,161	$762,019
2011	352	$112,415
2012	1,900	$476,661
2013	1,720	$314,458
2014	2,278	$487,151
2015	1,649	$275,154
TOTAL	**63,451**	**$11,227,481**

Financial Assistance

Grants to Local Governments - Coordinated Prevention Grants

Coordinated Prevention Grants (CPG) have been historically funded by the Local Toxics Control Account (LTCA), although for the 2015-17 Regular Cycle, the State Building Construction Account (SBCA) funded the CPG program. Local governments use 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.

Ecology administers the CPG Program through WAC 173-312, following the intent of the Model Toxics Control Act (Chapter 70.105D RCW) to:

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

Ecology divides projected allocations from SBCA bonds CPG into two portions: 80 percent for Solid and Hazardous Waste Planning and Implementation Grants, and 20 percent for Solid Waste Enforcement Grants (SWE). SWE Grants fund inspections and administrative expenses necessary to enforce state and local solid waste regulations pursuant to Chapter 70.95 RCW.

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).

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.

Grant Cycles

The CPG Program awards funds in two grant 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). Funds can also come from any special legislative appropriation. Ecology awards offset cycle funds through a competitive process.

2015-17 Biennial Grant Cycle

Regular Cycle – Allocation

CPG runs a two-year grant cycle (July 1, 2015 – June 2017). CPG received an allocation of $15 million, nearly half of the $29.6 million request. The CPG program operates on a two-year grant cycle that aligns with the state biennial budget starting with the 2015-17 Biennium.

Offset Cycle – Allocation

The minor amount of unrequested funds did not warrant an Offset Cycle in the 2015-17 cycle.

2015-17 Twenty Four Month Grant

Regular Cycle

For the 2015-17 regular cycle, CPG drafted 117 agreements based on a 24-month period (July 2015 – June 2017). The agreements aligned with the biennial calendar (July to June).

The Legislature allocated $15 million to the CPG Program for the 2015-17 Biennium. Ecology provided regular cycle funding to help local governments carry out their solid and hazardous waste management plans including recycling, household hazardous waste collection, and solid waste enforcement. Grants were awarded from these funds beginning July 10, 2015. These grants also fund organics composting and conversion, MRW practices, waste reduction and recycling, and commercial outreach. Ecology awarded 117 grants to Washington counties, cities, and health agencies totaling $15 million during the regular cycle.

2015-17 Regular Cycle Highlights

Local government efforts implementing the State Plan using CPG funds. 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 the State Solid and Hazardous Waste Plan and increase Washington's recycling rate.

Expansion of rural recycling programs. Grant County's Waste Reduction and Recycling project will collect and transport recyclables to a market and provide outreach and education to residents, schools, and businesses. The county estimates diverting recyclable commodities from the waste stream from the residents. Grant County's organics project will conduct home composting workshops and divert organic material from collection events to a local composter for processing.

Organics. Thurston County will continue the comprehensive countywide food waste prevention campaign. Their campaign focuses on expanding the success of providing equipment, tools, supplies and infrastructure to the main food bank in Thurston County to county food bank satellite/mobile locations, food pantries and meal programs, and other dedicated storage facilities. This task will also expand prevention efforts to grocery stores. For their food waste prevention campaign, they planned for phases of technical assistance, education, and outreach. The plan targeted residents, businesses, and schools over the two-year grant period.

Waste reduction and recycling. Seattle Public Utilities plans to focus on commercial waste prevention and recycling technical assistance to provide resources for Seattle businesses to reduce, divert, and/or recycle material as an outcome of making business contacts. Businesses will also be provided with comprehensive, single-use container and food waste management training, and Seattle Public Utilities

expects a rate of 10 percent of all businesses receiving hands-on technical assistance to adopt one or more waste prevention practices.

Hazardous waste. Lewis County will continue to operate the MRW facility located at the Lewis County Central transfer station, and a satellite site located at the east Lewis County Transfer Station as described in the MRW Operations Plan. Lewis County plans to purchase oil collection containers and install previously purchased containers in the following communities: Pe Ell, Winlock, Onalaska, Mossyrock, Napavine, Chehalis will be considered for the upgrade or the current collection station will be removed. Lewis County will promote use of less toxic products, and work with others to find solutions for problem wastes such as electronics and mercury.

Solid and hazardous waste planning. Douglas County will revise the 2010 Solid Waste Management Plan. 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 and safely manage the wastes that remain.

Solid waste enforcement (SWE). The Skagit County Public Health Department will focus on SWE activities in Skagit County. The health department will complete inspections at existing solid waste handling facilities, and investigate and resolve complaints and technical assistance inquiries regarding the enforcement of solid waste regulations in Skagit County.

CPG Workgroup focused on Budget Impact Allocations and Update of WAC 173.312, 313

The W2R Program formed a CPG Workgroup comprised of one SWI grant recipient and one SWE grant recipient from each of Ecology's four regions across the state to represent CPG recipients. With the 2015-17 cycle budget cut by more than 50 percent, the workgroup recommended allocations for the county programs working with the funding cut in half. Ecology also set up a separate CPG Rules Advisory Committee for stakeholder comment on the update of WAC 173.312 and 313.

CPG Joined the New Ecology Administration of Grants and Loans (EAGL) Process

EAGL is a comprehensive, web-based grant and loan management system that allows Ecology's grant and loan clients to complete grant applications, submit payment requests with progress reports, submit closeout reports, and request amendments online. The system provides a streamlined application and reporting process for both external clients and Ecology staff. In addition, as a paperless system, both natural resources and shipping costs are saved. CPG recipients in the 2015 Regular Cycle applied, completed agreements, and submitted progress reports and payment requests online in the EAGL system.

Grants to Citizens - Public Participation Grants (PPG)

Purpose

Washington's *Chapter 170.105D RCW, Hazardous Waste Cleanup - Model Toxics Control Act* provides for a PPG Program. PPGs 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. A 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:

    - Conducting public walking tours of the Anacortes Bay Wide cleanup site.
    - Developing a school curriculum regarding the Hanford cleanup site and its history.
    - Providing health advisories to ethnic communities regarding Spokane River contamination.

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

    - Providing information on recycling and sustainability to low-income communities.
    - Introducing biochar technology and its applications to rural communities.
    - Educational campaigns to keep toxic materials out of Puget Sound.

Fiscal Year 2014

The PPG Program started the 2013-15 funding cycle. The PPG Program received $3.53 million for the 2013-15 Biennium. The funding allowed PPG to award 22 contaminated site grants and 20 waste management grants. Sixteen of the twenty-two contaminated site grants were awarded to 2011-13 grant recipients. New cleanup sites covered by PPG include Lake Washington, Magnuson Park, Bellingham Bay, March Point Landfill, and the Boeing Fabrication Plant (Auburn).

Fiscal Year 2015

PPG funding for the 2015-17 Biennium was eliminated during the 2016 Legislative session.

Table 2.6
PPG Projects for 2013-15

Organization	County	Purpose	Funding Awarded
Contaminated Site Grants			
Friends of Skagit Beaches	Skagit	Provide public education and outreach regarding the Anacortes Bay Wide cleanup.	$116,000
Hanford Challenge	Statewide	Improve and expand understanding of Hanford issues, and provide meaningful public engagement.	$120,000
Institute for Neurotoxicology and Neurological Disorders (INND)	King and Snohomish	Identify sources of potentially unhealthful toxics and odor from large-scale compost operations.	$70,000
Columbia Riverkeeper	Statewide	Provide public education and outreach regarding the Hanford cleanup.	$120,000
Washington Physicians for Social Responsibility	Statewide	Statewide public education about Hanford in order to promote public participation in Hanford cleanup decision making.	$120,000
Citizens for a Healthy Bay	Pierce	Engage the public in protecting the health of Commencement Bay through education.	$78,000
Georgetown Crime Prevention and Community Council	King	Provide public education and outreach regarding the Phillips Services Georgetown cleanup site.	$50,000
Olympic Environmental Council	Clallam	Engage and educate the public regarding the Rayonier Mill and Port Angeles Harbor cleanup and restoration.	$88,000
The Lands Council	Spokane, Stevens, and Lincoln	Involve ethnically diverse members of the public on Spokane River cleanup and restoration.	$55,000
Heart of America NW Research Center (HOANWRC)	Statewide	Provide information and citizen participation opportunities focused on the cleanup of Hanford. Grants cover two separate Hanford sites.	$110,000 $115,000
Brackett's Landing Foundation	Snohomish	Encourage community involvement in cleanup decisions at the UNOCAL/Chevron site.	$49,000
Duwamish River Cleanup Coalition	King	Provide education and outreach regarding the Duwamish River cleanup.	$120,000
Futurewise	Snohomish	Provide education and outreach regarding the Port Gardner Bay cleanup to community members.	$100,000
Lake Roosevelt Forum	Lincoln, Stevens, Ferry, and Grant	Improve community engagement and understanding of Lake Roosevelt RI/FS.	$46,000

Organization	County	Purpose	Funding Awarded
HOANWRC	Statewide	Provide education and outreach regarding the US Ecology-Hanford cleanup site.	$75,000
HOANWRC	King	Provide education and outreach regarding the Lake Washington and Magnuson Park cleanup sites.	$80,000
RE Sources for Sustainable Communities	Whatcom, Skagit	Provide education and outreach regarding the March Point Landfill and Bellingham Bay cleanup sites.	$76,000
Futurewise	King	Provide education and outreach to Algona residents regarding the Boeing Fabrication Plant cleanup site.	$120,000
HanfordLearning.Org	Statewide	Develop classroom curriculum on the Hanford cleanup site.	$108,000
Waste Management Grants			
Spokane River Forum	Spokane, Stevens, Lincoln	Spokane River waste and toxics reduction education and outreach.	$51,000
INND	Statewide	Northwest Children's Environmental Health Forum.	$30,000
Spokane Neighborhood Action Partners	Spokane	Living green sustainability education and outreach.	$80,000
Sustainable Obtainable Solutions	Okanogan, Ferry, Stevens, Pend Oreille	Introduce biochar technology and applications to rural communities.	$115,000
Nisqually River Foundation	Thurston, Pierce, Lewis	Storm water runoff pollution education.	$88,000
Environmental Coalition of South Seattle	Snohomish	Small business pollution prevention education and outreach.	$65,000
Port Townsend Marine Science Society	Jefferson	Toxics reduction in storm water runoff educational displays.	$90,000
Sustainable Resources INW	Statewide	Create a byproduct synergy network of industries and institutions.	$108,000
YMCA of Greater Seattle	King, Snohomish	Earth Service Corp.	$60,000
Zero Waste Washington	King	Neighborhood lending library for durable products.	$84,000
Zero Waste Washington	King	Child car seat recycling program.	$53,000
Facing the Future	Statewide	Hanford student educational curriculum.	$94,980
Yakima Valley Habitat for Humanity	Yakima	Increase contractor participation in Habitat for Humanity stores.	$80,000
Seattle Tilth Association	King	Household waste reduction education and outreach.	$100,500

Organization	County	Purpose	Funding Awarded
Network for Business Innovation and Sustainability	Statewide	Byproduct synergy education and outreach.	$114,000
YMCA of Pierce and Kitsap Counties	Pierce, Kitsap	Puget Sound outdoor education program.	$110,000
Habitat for Humanity-Seattle	King	Green building education and outreach.	$109,500
Puget Soundkeeper Alliance	Statewide	Marina pollution prevention education.	$60,000
Just Health Action	King	Environmental Justice education.	$40,000
Salish Sea Expeditions	Puget Sound	Sound & Source education program.	$60,000
Pacific NW Pollution Prevention Resource Center	King, Snohomish	Auto shop waste reduction education and outreach.	$54,000
Puget Creek Restoration Society	Pierce, King	Puget Sound storm water pollution education.	$55,000
Total for 2013-15 Biennium			**$3,528,584**

Local Planning

Local solid waste planning is the cornerstone of solid waste management in Washington State. The 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, Chapter 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, Chapter 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 State Solid and Hazardous Waste Plan (Beyond Waste) 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 is currently in the process of updating the *Guidelines for the Development of Local Solid Waste Plans and Plan Revisions* to clarify city responsibilities for independent planning, encouraging electronic submittal of local plans, improving the five-year review, and revising as necessary. Draft guidelines will be out for review in summer 2016.

Ecology provides technical assistance to local governments as they prepare and carry out their plans, and also approves them. Coordinated Prevention Grants (CPG), discussed earlier in this chapter, provide funds for both planning and implementation programs. Table 2.7 lists the current status of local solid waste plans and hazardous waste plans for each county, and the cities that choose to do individual plans.

Table 2.7
Current Status of Solid & Hazardous Waste Plans in Washington as of December 2015

County	SW Plan Last Approved	WR/R Goal	HW Plan Last Approved	Combined Plans?* (Yes/No)	Comments
Adams	2006	50% recycling rate goal. 25% waste reduction and recycling rate by 2019.	1992	No	
Asotin	2011	No specific number mentioned.	2011	Yes	
Benton	2014	50% by 2020.	1991	Yes	Approved November 2014.
Chelan	2007	25% recycling rate by 2010. 5% reduction from the current waste stream by 2010.	1990	Yes	The review process for Chelan County's new CSWMP began in the third quarter of 2014 and is still underway as of 12/31/2015.
Clallam	2014	40% diversion goal	2014	Yes	
Clark	2015	50% recycling rate.	2015	Yes	
Columbia	2015	No specific number mentioned. Goal is to increase diversion rates from 2% to 5% depending on material collected.	2015	Yes	
Cowlitz	2012	50% recycling rate.	2012	Yes	

County	SW Plan Last Approved	WR/R Goal	HW Plan Last Approved	Combined Plans?* (Yes/No)	Comments
Douglas	2010	10% residential recycling, 10% commercial recycling, and 20% public sector recycling by 2015.	2010	Yes	The review for Benton County's new 2015 CSWMP began second quarter 2014 and is still underway as of 12/31/2015.
Ferry	2011	30% recycling by 2015.	2011	Yes	
Franklin	2011	Supports the state goal of reaching 50% recycling rate by 2028.	2011	Yes	
Garfield	2008	No specific number commitment.	1992	No	
Grant	2008	Supports the state goal of reaching 50% recycling and to increase the current recycling rate above 19%.	1992	No	Part of a combined Grant-Adams-Lincoln Counties MRW plan that hasn't been followed for a decade or longer. Administrative amendments to recycling chapter in process in October 2014.
Grays Harbor	2013	Reduce waste by 5% through recycling.	2013	Yes	
Island	2014	Assist the state in achieving its goal of 50%.	2014	Yes	
Jefferson	2008	50% recycling and diversion.	1991	No	Preliminary draft plan expected in 2016.
King	2002	50% residential by 2006. 43% nonresidential by 2006.	2010	No	CSWMP draft update went out for public comment on October 8, 2009, was submitted to Ecology on April 1, 2011. The CSWMP is currently with the Executive's Office; and, due to potential changes in the transfer system plan, may require another update before a final is submitted. Because King County and the City of Seattle have independent CSWMPs, their joint HW Plan remains separate from the CSWMPs.
King: Seattle	2013	Overall recycling rate by 2015: 60%. Overall recycling rate by 2022: 70%.	2010	No	The current CSWMP is again in review by the City for an update. Seattle and King County have a joint HW Plan, independent of their respective CSWMPs...

County	SW Plan Last Approved	WR/R Goal	HW Plan Last Approved	Combined Plans?* (Yes/No)	Comments
Kitsap	2011	Supports the state goal of reaching 50% recycling.	2011	Yes	A review of the combined Plan will be requested in 2016.
Kittitas	2012	Countywide recycling rate of 50%. Supports the state goal of reaching 50% recycling.	1991	Yes	The County's current CSWMP is currently under review as of 12/31/2015.
Klickitat	2013	Countywide recycling and diversion goal of 50%.	2000	Yes	Final CSWMP approved April 2013.
Lewis	2008	Increase recycling.	2008	Yes	A preliminary draft plan expected in 2016.
Lincoln	2011	Commits to assisting the state to meet its 50% goal.	2011	Yes	
Mason	2007	Increase recycling.	2011 by amendment	Yes	A preliminary draft plan expected in 2016.
Okanogan	2012	Supports the state goal of reaching 50% recycling.	2006	Yes	Final CSWMP approved October 2012. The County is planning to begin its review of this document by 2017.
Pacific	2006	Increase the recycling rate by 50 tons.	1990 – 2000 Operations Plan	Yes	
Pend Oreille	2011	Supports the state goal of reaching 50% recycling and to increase the current recycling rate above 10%.	2011	Yes	
Pierce	2008	75% recycling and diversion rate.	1990	No	A preliminary draft plan expected in 2016.
San Juan	2012	50% recycling rate by 2018.	2012	Yes	County expects to begin five-year review and planning process in 2017.
**San Juan - Town of Friday Harbor	2014	Support the state's recycling goal of 50%.	2014	Yes	
Skagit	2005 (amended 2008)	50% diversion.	1992	No	Currently working with SWAC and updating the plan chapter by chapter. No plans to update HW plan.
Skamania	2015	50% recycling rate.	2015	Yes	
Snohomish	2013	Supports the state goal of reaching 50% recycling.	1993	Yes	

County	SW Plan Last Approved	WR/R Goal	HW Plan Last Approved	Combined Plans?* (Yes/No)	Comments
Spokane	2014	Supports the state goal of reaching 50% recycling and to achieve a 65% recovery rate by 2020.	2014	Yes	
**Spokane - City of Cheney	2014	No specific percentage commitment.	2014	Yes	
**Spokane - Liberty Lake	2015	No specific percentage commitment.	Pending (late 2014-early 2015	No	Preliminary draft currently under Ecology review.
**Spokane - City of Spokane Valley	2015	References current 54.7% recycling rate.	2015	Yes	
Stevens	2015	17% current recycling rate in support of the state goal of 50% recycling rate.	2015	Yes	
Thurston	2013	Increase recycling rate by 5%.	2014	No	
Wahkiakum	2015	20% recycling rate.	2015	Yes	
Walla Walla	2015	50% recycling rate by 2023.	2015	Yes	
Whatcom	2010	50% diversion.	2010	Yes	Plan approved 2010, but dated 2008. As of December 2015, Ecology had commented on Preliminary Draft Plan. Final Draft expected early 2016.
Whitman	2012	No specific percentage commitment.	2012	Yes	
Yakima	2010	Support the state's recycling goal of 50%.	2010	Yes	2015 CSWMP plan review started Q1 2014 and is currently underway as of 12/31/2015.

*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.

**City has independent plan.

Outreach, Assistance, and Information Sharing

Washington State Solid Waste Information Clearinghouse

In 2004-06, 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 accomplishments online and share project information, lessons learned, and materials produced (posters, reports, videos, etc.) with anyone signed up for Secure Access Washington (SAW). Access to the work of others gives all local governments the opportunity to strengthen and coordinate their programs. The system also collects basic information about county and city programs.

The primary audience for this site includes local government solid and hazardous waste and health department staff. The Information Clearinghouse includes:

- State Profile.
- County and City Profiles.
- Local Projects.
- Outreach Materials & Other Resources.

Ecology initiated the Clearinghouse in 2010. As of April 2016, the site had 258 registered users and contained 1,146 posted (publicly viewable) projects, 1,595 posted resources, 312 solid waste staff contacts, and 125 health department staff contacts.

The challenge of getting the local city and county profiles populated with data remains. This relies on a partnership between Ecology and local governments, and the agencies hold the responsibility to update various pieces of the profiles.

Ecology annually coordinates with statewide city and county planners to ensure the Clearinghouse contains the most up-to-date version of their existing solid waste plans. Ecology will also assess the training and readiness of stakeholders to use the Clearinghouse and determine if users need additional training. The W2R Program Data Team will integrate the Clearinghouse with other data collection, storage, and analysis systems used throughout the program. Ecology will also consider migration of other grant programs into the Clearinghouse to increase resource availability.

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 that any person officially inspecting these solid waste facilities be a certified operator.

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 training, testing, continuing education, recertification, and program administration for landfill certification. SWANA annually provides Ecology with a list of currently certified persons. The incinerator certification program continues to be Ecology's responsibility.

In 2014, Washington had 177 active operator/inspector landfill certifications (up from 164 in 2013). We also had 62 active operator/inspector incinerator certifications (down from 76 in 2013).

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 math skills to pass a SWANA test, even though they are quite capable of safely operating a landfill and compliant with applicable rules. There has been interest in developing a different program for certification.

Ecology, health districts, and counties will work, as time and resources allow, 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.

Recycling Information Line

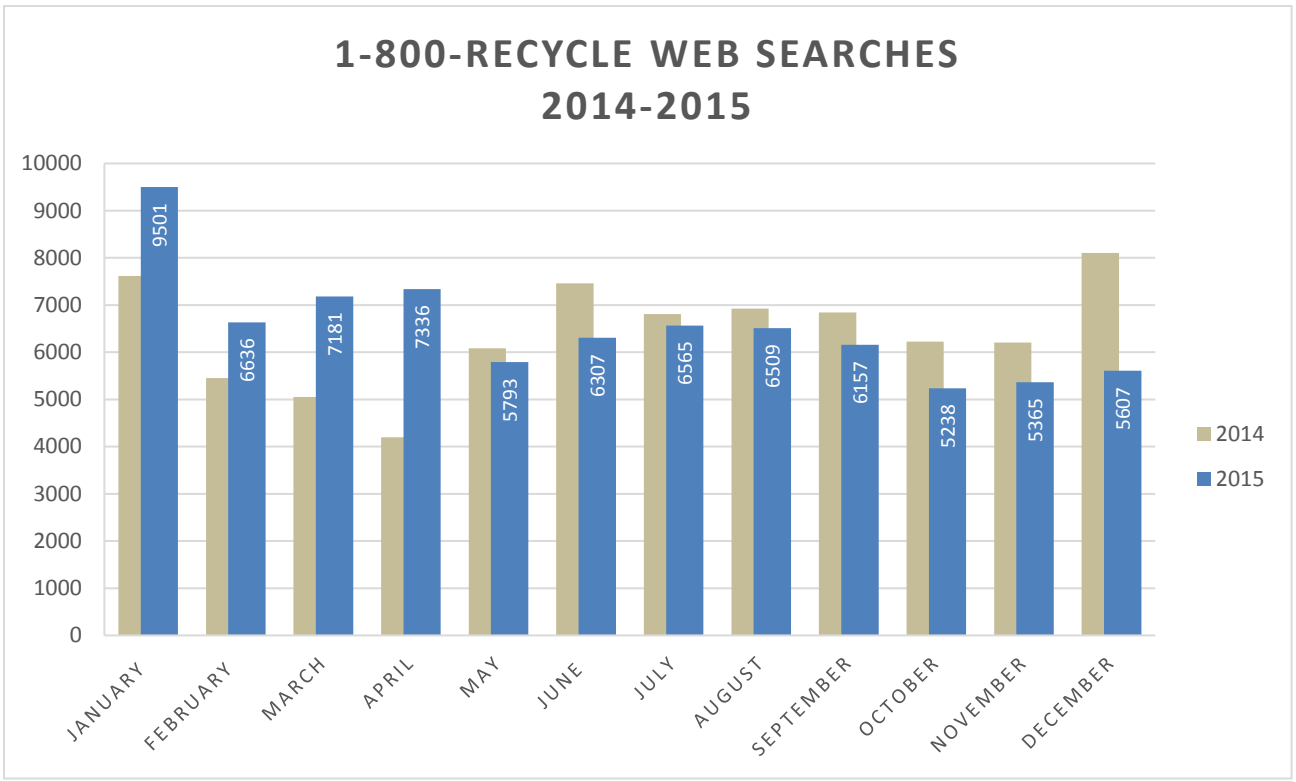
The W2R Program operates the 1-800-RECYCLE hotline to help Washington State citizens find information about recycling. The hotline has operated since 1976 as a free service that assists the public in finding general recycling locations, pickup services, and one-time recycling collection events.

In 2015, the 1-800-RECYCLE team received more than 5,600 phone calls. Due to additional staff resources, the team was able to extend hours from 9 a.m. to 1 p.m. to 9 a.m. to 3 p.m. on weekdays. In addition, the team added a voicemail feature, an option for phone recordings in Spanish.

The hotline team manages a recycling database that allows residential and commercial customers to search for recycling information online (1800recycle.wa.gov). The team updates information on more than 1,700 recycling facilities each year. The recycling database webpage provides information on local government resources and links to recycling organization websites. In 2015, there were more than 80,600 searches using the online recycling database.
The E-Cycle Washington Program continues to advertise the hotline as the primary tool for the public to locate local electronics recycling locations. About half of the database searches in 2015 were regarding electronic recycling. The hotline team also coordinates with LightRecycle Washington to promote recycling locations for mercury light bulb recycling. In 2015 about six percent of total searches were regarding mercury light bulb recycling.

The W2R Program Kid's Page (http://www.ecy.wa.gov/programs/swfa/kidspage/) is also managed by the hotline team. This page offers a collection of links to environmental education websites, and fun environmental games for teachers and kids. The most popular page provides facts and trivia about different materials that are recycled, which had more than 11,800 visits in 2015. The team added a number of new resources and created three printable coloring pages that can be accessed on the webpage.

The hotline staff also manages a Facebook page where recycling events and current recycling information are shared with the public. Social media is an effective communication tool used to increase public participation and encourage relationships with other members of the community. Public involvement in the 1-800-RECYCLE Facebook page has steadily increased throughout 2015.


1-800-RECYCLE WEB SEARCHES
2014-2015
10000
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7000
6000
5000
4000
3000
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1000
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9501
6636
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7336
5793
6307
6565
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6157
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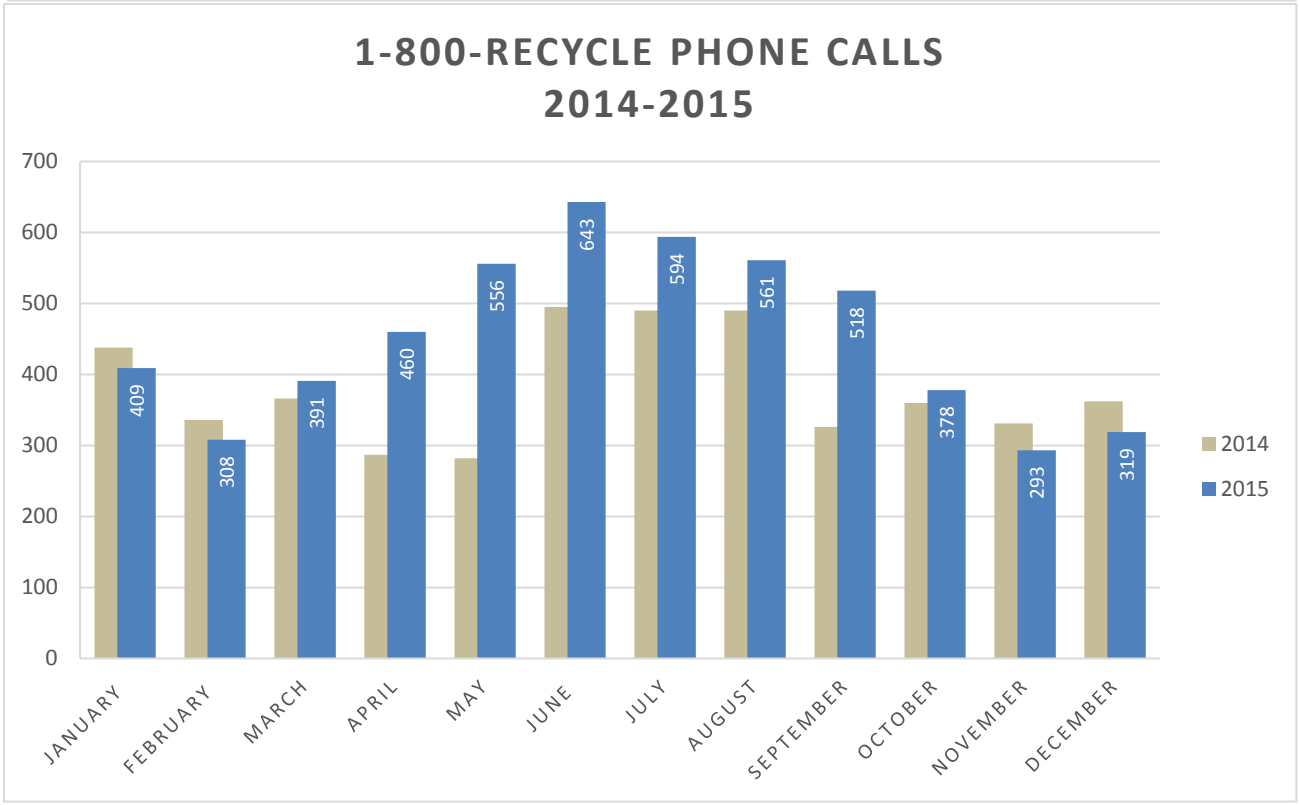
2015


1-800-RECYCLE PHONE CALLS
2014-2015
700
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556
643
594
561
518
378
293
319
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FEBRUARY
MARCH
APRIL
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JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
2014
2015

Chapter 3: Statewide Litter Prevention & Cleanup Programs

Chapter 70.93 RCW, *the Waste Reduction, Recycling, and Model Litter Control Act*, assigns Ecology lead agency status to manage statewide litter programs. Since 2009, work on litter control and litter prevention activities has been significantly reduced due to budgetary constraints. Similar to the 2013-15 Biennium, the Legislature diverted more than 50 percent of the Waste Reduction, Recycling and Litter Control Account (WRRLCA) to the State Parks and Recreation Commission (Parks) in the 2015-17 Biennium. Funds available for litter pickup efforts are reduced. Funding for litter pickup for this biennium is being directed to the Department of Corrections (DOC), Department of Natural Resources (DNR), Department of Fish and Wildlife (WDFW), Department of Transportation (WSDOT), and Ecology only. Other impacts to the litter program include:

- No funds to carry out the litter prevention campaign.
- No funds to conduct the statewide litter survey.
- No staff for the Litter Hotline to respond to citizen complaints about litter.
- No staff or funds to fulfill public requests for litter and secured loads materials.

With the continued reduced funding, Ecology put forward the following efforts in litter control and pickup:

- Helped coordinate litter pickup activities. Managed allocations from the WRRLCA for other state agencies.
- Deployed 56 summer Ecology Youth Corps (EYC) litter cleanup crews statewide, resulting in hiring nearly 300 youths. Most of these crews worked between 16 and 19 days. Also deployed nine Ecology median crews in spring, seven in fall, and one median crew for a portion of the summer.
- Administered the Community Litter Cleanup Program (CLCP).
- Maintained productive partnerships with other state agencies and local governments.

Litter Prevention Campaign

There was no funding or staff to implement a comprehensive prevention campaign in 2015 or earlier. There is no funding or staff to support a prevention campaign for the 2015-17 Biennium.

Secured Load Materials and Website

There was no secured loads campaign in 2015 other than the enforcement activity described below. There is no funding for a secured loads campaign in 2015-17. The litter website is still operational, but we have informed readers that many of the activities described on the website are currently suspended.

Enforcement Activities

The last time Ecology supported litter emphasis patrols was in May 2011 when the Washington State Patrol (WSP) conducted litter enforcement patrols along the I-5 corridor and in Spokane. The 2011 effort lasted four weeks, with law enforcement officers logging approximately 650 hours, making 534 litter educational contacts, which resulted in 112 litter citations.

There are no plans for a litter emphasis patrol in the 2015-17 Biennium.

Litter Hotline Program

The Litter Hotline is a toll-free phone line (1-866-LITTER-1) 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.

Because of the budget reduction to WRRLCA, starting in July 2011 Ecology suspended answering the hotline. The hotline now has a recorded message for callers:

> *"Thank you for calling the 1-866-LITTER-1 reporting line. Due to state budget cuts, we are now unable to accept reports on witnessed littering events. We hope that this service might be restored in the future, but for now it has been suspended. If this is an emergency regarding a dangerous unsecured load, please hang up and dial 911. And thank you for doing your part to keep Washington clean."*

Ecology is no longer sending letters to litter violators. Ecology's "Litter and It Will Hurt" signs remain on the state's highways as a visual reminder to the public to not litter. The litter hotline still receives between 200 and 250 calls per month due to these signs remaining up.

Litter Program Fund Allocation

The Legislature cut the 2013-15 WRRLCA budget by $11.7 million and suspended the 20/30/50 allocation requirements. In the 2015-17 budget, $10 million was swept from the account to Parks for maintenance and operation of state parks. The 20/30/50 allocation parameters were restored.

WRRLCA supports a variety of programs. The fund's 20/30/50 allocation is as follows:

- $2.41 million to local government funding programs.
- $2.74 million to Ecology waste reduction & recycling activities.
- $4.56 million to Ecology and other state agency litter cleanup & prevention activities.

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

- Ecology worked at a reduced level of effort with our summer EYC.
- Ecology suspended most of the Litter and it will Hurt campaign. Only the roadway signs and an edited Ecology-hosted website remain to inform state residents about littering. We no longer answer the litter hotline, and there is no way for the public to report littering incidents.
- WSP still enforces state litter laws, but there are no Ecology funded emphasis patrols for the upcoming biennium that focus on litter violations and secured loads.
- Ecology reduced funding to DNR and DOC, and cut funding completely to WSDOT, WDFW, and Parks (for litter pickup).

Ecology Youth Corps

2015 marked the 40th year of operation for the 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 and median. 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. In 2015, Ecology received 1,674 applications and hired 296 youth. Youth crews typically work two four-week summer sessions with a complete turnover of crews occurring mid-summer. However, in recent years some crews have worked three weeks each to stretch our dollars and provide more youth job experience.

During the 2015 EYC crew season, litter on state highways was collected in the following counties:

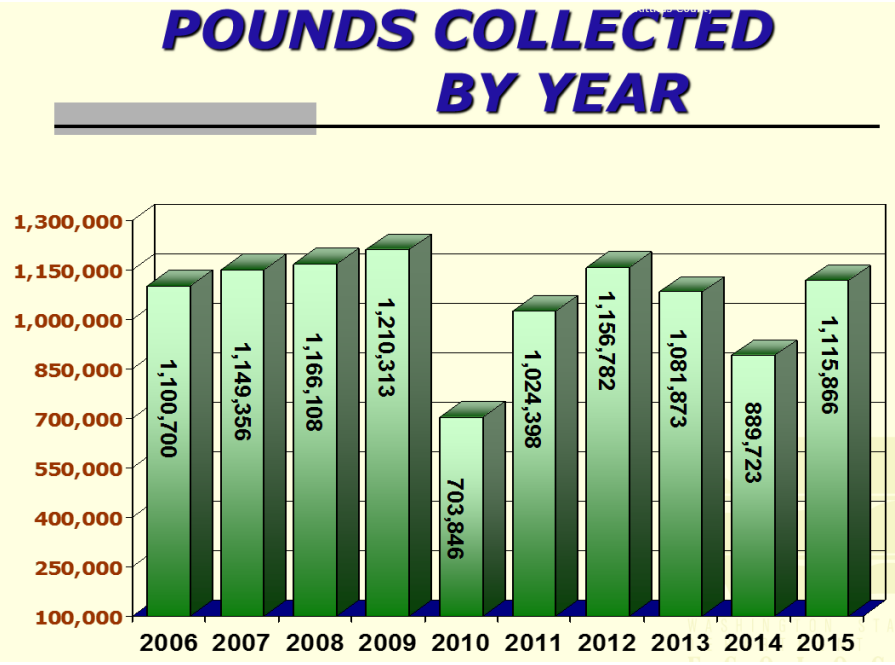
- ✓ Central Region (CRO): Benton, Kittitas, Klickitat, and Yakima.
- ✓ Eastern Region (ERO): Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla and Whitman.
- ✓ Northwest Region (NWRO): Island, Kitsap, King, San Juan, Skagit, Snohomish, and Whatcom.
- ✓ Southwest Region (SWRO): Clark, Cowlitz, Grays Harbor, Lewis, Mason, Pierce, and Thurston.

The most recent totals for the EYC program are for the 2015 crew season.

Table 3.1
Ecology Youth Corps Program Outputs

	Jan - Dec 2015
Total Hours Worked (Supervisor + Crew)	67,210
Total Pounds Collected (Litter + Illegal Dump + Recycled)	1,115,870
Miles	5,245
Acres	670
Number of Illegal Dumps Cleaned	171

Figure 3.1



Litter Survey

Ecology did not conduct the 2008-09 Litter Survey because of budget cuts, and there was no funding for it from 2010-14. Because of the continued budget reduction to WRRLCA for 2015-17, there is still no funding to conduct the survey. Information on previous litter studies is available on the litter webpage at http://www.ecy.wa.gov/programs/swfa/litter/public.html#a1.

Community Litter Cleanup Program

In 1997, 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.

Table 3.2 highlights the work accomplished through CLCP for 2015.

Table 3.2
Community Litter Cleanup Program Outputs

	Jan - Dec 2015
Total Hours Worked (Supervisor + Crew)	69,241
Total Pounds Collected (Litter + Illegal Dump + Recycled)	1,992,470
Miles	12,606
Acres	1,599
Number of Illegal Dumps Cleaned	1,744

CLCP has $2.4 million available for the 2015-17 Biennium, about $1 million less than fully funded years.

Litter Cleanup by Other State Agencies

Because of Legislative reductions to WRRLCA for 2011-15, state agencies saw a decrease in funding from previous years. Additional budget reductions to WRRLCA for 2015-17 have further impacted state agency litter pickup budgets. WDFW and WSDOT were eliminated from the budget in 2015, but have received funding in Calendar Year 2016. Parks received no monies

for litter cleanup activities, but as previously noted received more than 50 percent of all WRRLCA dollars for operation and maintenance of state parks. DNR was reduced to $200,000. DOC was reduced by $200,000 to $420,000. Table 3.3 shows the budget for three biennia.

Table 3.3
Ecology Interagency Agreements for Litter Activities
July 1, 2009 – June 30, 2015

	2009-11 Biennium	2011-13 Biennium	2013-15 Biennium	2015-17 Biennium
Department of Corrections	$620,000	$620,000	$420,000	$520,000
Department of Fish and Wildlife	$ 20,000	$0	$0	$100,000
Department of Natural Resources	$415,000	$320,000	$200,000	$320,000
Department of Transportation	$ 85,000	$ 0	$0	$100,000
Parks and Recreation Commission	$ 40,000	$ 0	$0	$0
Total	$1,180,000	$940,000	$620,000	$1,040,000

Parks and Recreation Commission

Because of the continuing budget reductions to WRRLCA for 2015-17, Parks again is not receiving funding for litter pickup for the biennium.

Department of Fish and Wildlife

Because of the continuing budget reductions to WRRLCA for 2013-15, WDFW did not receiving funding for litter pickup in 2015, but received $100,000 for the remainder of the 2015-17 Biennium.

Department of Corrections

DOC receives funding from Ecology to run community based correctional litter crews on state roads, state lands, and in local communities. The funds support crews in Seattle, Tacoma, Monroe, Wenatchee, Ellensburg, Yakima, the Tri-Cities, Moses Lake, Spokane, and Everett. For the 2015-15 Biennium, funding for DOC was reduced to $420,000 or 1,112 days. Table 3.4 summarizes DOC's litter crew activity in 2015. DOC is receiving $520,000 for the 2015-17 Biennium.

Table 3.4
Department of Corrections Litter Removal Activity

	Jan - Dec 2015
Total Hours Worked (Supervisor + Crew)	22,404
Total Pounds Collected (Litter + Illegal Dump + Recycled)	552,931
Miles	1,705
Acres	173
Number of Illegal Dumps Cleaned	151

Department of Natural Resources

DNR Camps Program, in partnership with DOC, puts offender crews to work on state lands. As Table 3.5 illustrates, this program has considerable impact on litter cleanup and illegally dumped materials in state-owned forests. Table 3.5 summarizes DNR crew activity in 2015.

Table 3.5
Department of Natural Resources Litter Removal Activity

	Jan - Dec 2015
Total Hours Worked (Supervisor + Crew)	12,249
Total Pounds Collected (Litter + Illegal Dump + Recycled)	157,608
Miles	472
Acres	123
Number of Illegal Dumps Cleaned	281

Because of the budget reduction to WRRLCA for 2015-15, DNR's funding was further reduced to $200,000.

Department of Transportation

WSDOT is responsible for picking up litter along state roads, including bags of litter collected by Adopt-a-Highway groups, EYC, and DOC.

In 2015, WSDOT crews removed and disposed of 3,038 tons of litter from state roadways (roughly six million pounds).

Because of the budget reduction to WRRLCA for 2015-17, WSDOT did not receive funding for litter activities in 2015, but will get $100,000 for the remainder of the biennium.

Looking Ahead

The 2015-17 Biennium is as challenging as 2009-11, 2011-13, and 2013-15. Coordination of litter pickup efforts 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 the money and effort spent.

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

Preventing wastes in the first place, rather than managing them at the end of the pipe, is key to carrying out the State Solid and Hazardous Waste Plan. Recognizing we will continue to generate some wastes, the Plan calls for valuing these materials as resources and moving them into closed-loop recycling systems, or diverting them for other uses instead of disposing them.

To measure progress toward the State Plan's goals, a record of the amount and types of waste generated is necessary. To determine the amount of waste generated in Washington State each year, Ecology uses the total amount of materials disposed, 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 total amount of waste generated each year increased from 1999-2005. After steady decreases from 2006-2009, the amount generated has fluctuated with increases in 2010, 2013, and 2014 and decreases in 2011 and 2012. However, the amount generated in 2014 remains below the amount generated in 2005.

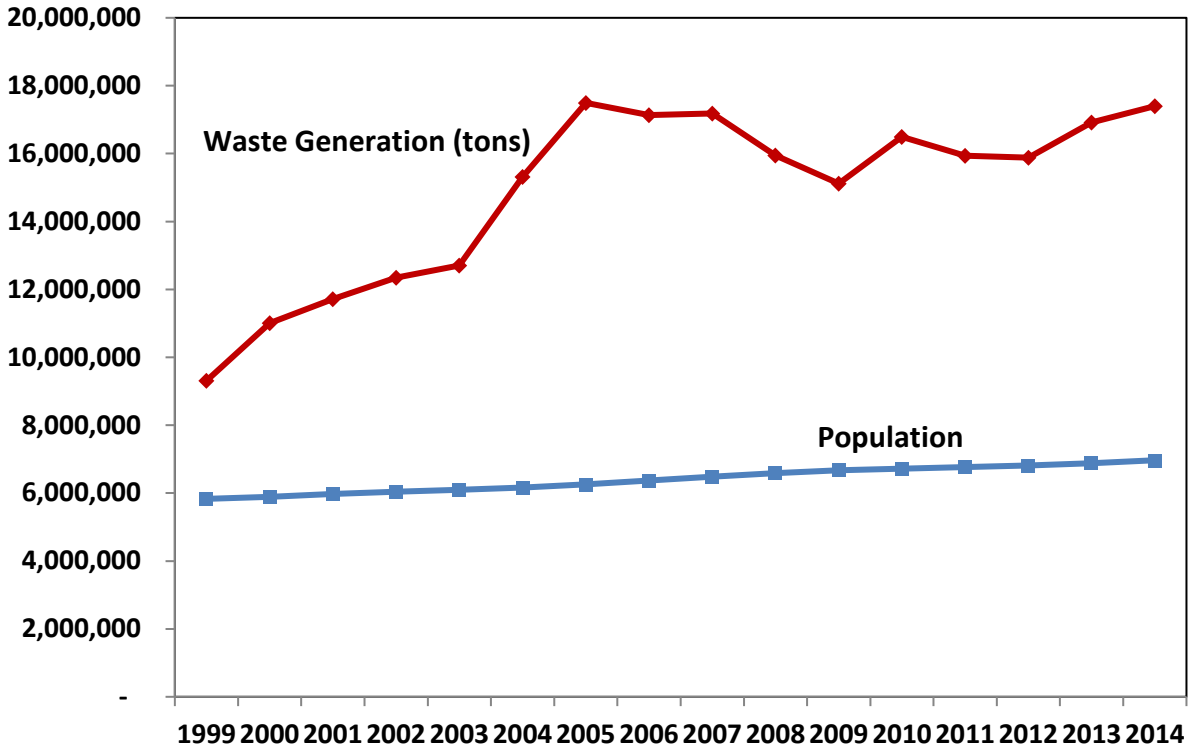
Washington State's population has continued to grow since Ecology began to track disposal and recycling. Population growth rates in Washington have averaged 1.7 percent per year from 1988 to 2014, with the total population increasing more than 2.5 million during that period.[1]

With an increase in population, often comes an increase in waste generation. This was the case in Washington in the past. However, waste generation decreased steadily starting in 2005 and only recently began increasing again (see Figure 4.1).

Since 1999, when Ecology began measuring the disposed solid waste stream by tracking annual report data from disposal facilities such as landfills and incinerators, the amount of waste generated per person has grown at an average annual rate of 2.7 percent. Per capita waste generation has decreased in the last decade, however, dropping .14 percent since 2005.

[1] Population figures from Office of Financial Management at http://www.ofm.wa.gov/

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 sent to landfills and incinerators are considered waste, but materials separated for recycling or other useful activities 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 they will be put to better uses than landfilling.

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

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.

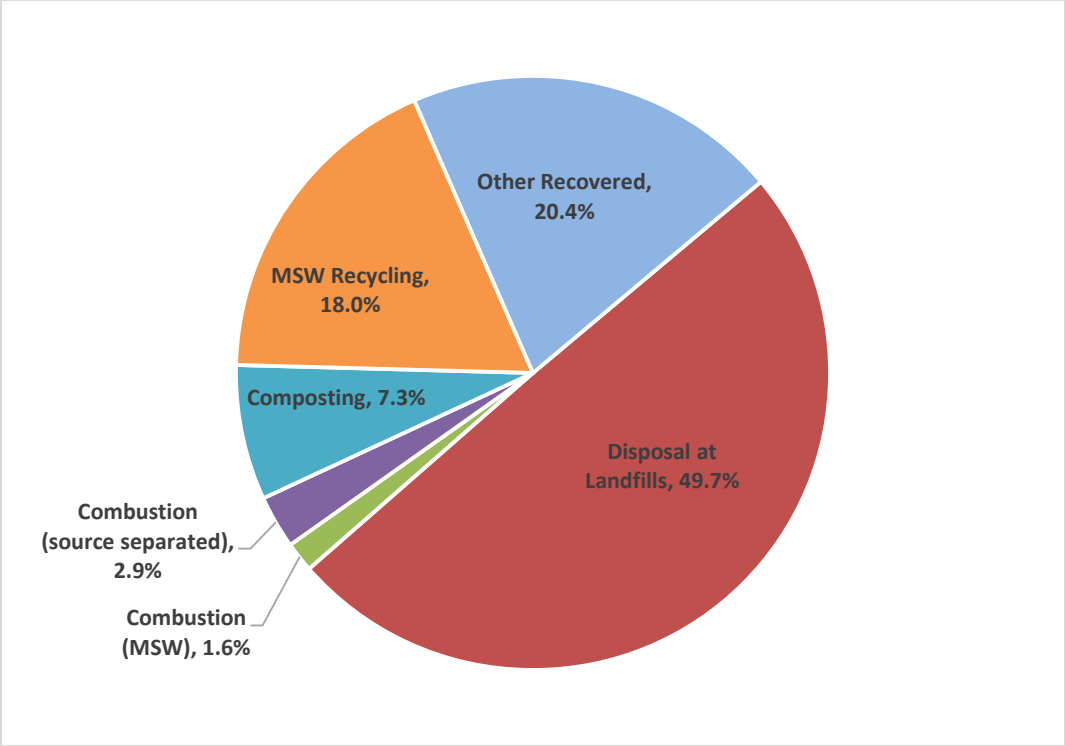
4. Composting in regulated facilities.

5. Recycling (transforming material into the same or other products – MSW only) in regulated and nonregulated facilities.

6. Other recovery (includes recycling of non-MSW materials and reuse) in regulated and nonregulated facilities.

Figure 4.2 shows a breakdown of the statewide waste management methods in 2014.

Figure 4.2
Waste Management Methods 2014



Some material types have one unique final use, such as aluminum cans that are recycled back into more aluminum cans. 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. Data quality is improving as recyclers develop systems to track this type of information.

For many years, the largest measured part of Washington's waste generation number was the disposed waste stream. This number increased over the long-term, but has decreased in recent years. The overall long-term increase could be occurring for several reasons. In some cases, we are simply throwing away more. Because of reporting requirements adopted in 2003 in *Chapter 173-350 WAC, Solid Waste Handling Standards*, we are getting more details from facility annual

reports on wastes we dispose. We are also getting information on waste disposal in other states (for example, waste tires generated in Washington that are disposed in Oregon and some other states).

We currently 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.

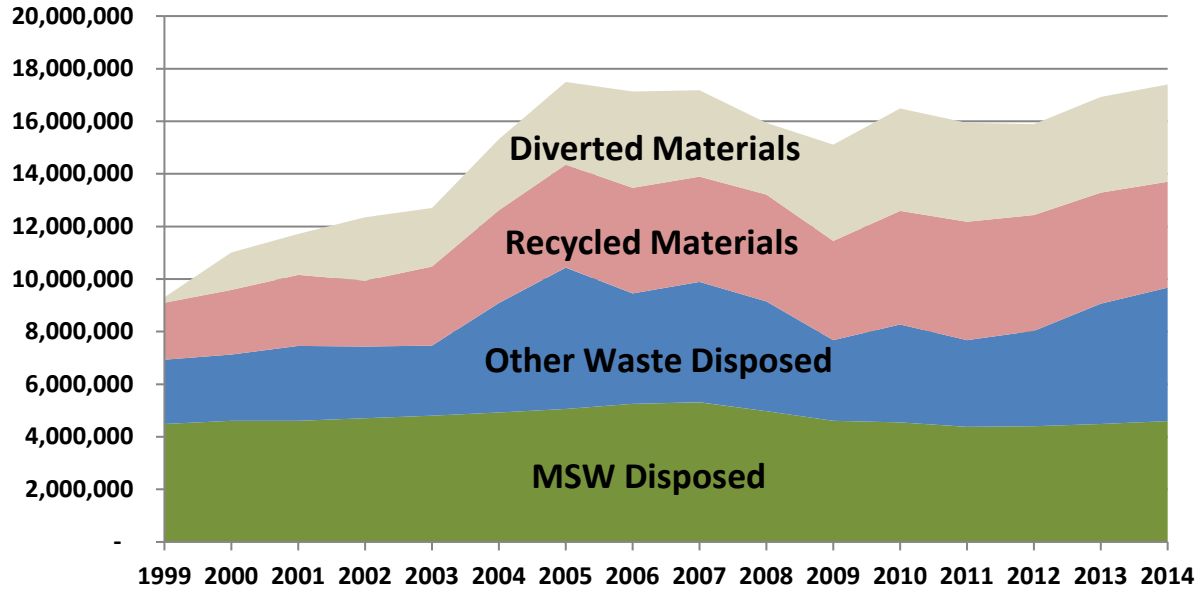
The other measured part of Washington's waste generation number is comprised of materials recycled and diverted from disposal. The reported list of materials included as recycling and diversion has increased over time. Since 1986, Ecology has largely followed EPA guidance when defining municipal solid waste 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 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 are continuing to increase our efforts to get better reporting from recyclers and those who divert waste from disposal. Due to Ecology tracking additional materials and improved reporting from recyclers, as well as actual increases in recycling and diversion, the total tonnage reported has increased over time.

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.

The recycling rate in the MSW Section looks at the municipal portion of the waste stream, or waste generated in households and businesses. It includes such items as durable and nondurable goods, containers, packaging, food waste, and yard debris. It does not include industrial waste; inert debris; asbestos; biosolids; contaminated soils; or construction, demolition, and land clearing debris. MSW or materials in the first category are sometimes called traditional recycling. Materials in the second category diverted from disposal and combined with the traditional materials make up the diversion rate.

Per capita numbers from for the MSW stream are shown in Table 4.1. Residents and businesses in the state generated 6.78 pounds MSW per person per day in 2014. 3.61 pounds were disposed and 3.17 pounds were recovered for recycling. For per capita MSW numbers for 1986 – 2014, 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	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
MSW Disposed	4.43	4.52	4.48	4.14	3.79	3.71	3.54	3.53	3.57	3.61
MSW Recycled	3.43	3.46	3.38	3.38	3.10	3.51	3.64	3.55	3.42	3.17
MSW Generated	7.86	7.97	7.86	7.52	6.89	7.22	7.19	7.08	6.99	6.78

MSW is only a portion 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 MSW disposed and all other waste types disposed at landfills and incinerators, plus recycled and diverted materials. The result is a much higher generation number for the state – 13.69 pounds per person per day, with 6.08 pounds recycled/diverted and 7.61 pounds disposed (Table 4.2).

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

Per Capita Solid Waste	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Disposed[2]	9.14	8.12	8.36	7.64	6.31	6.74	6.22	6.45	7.21	7.61
Recycled/ Diverted	6.18	6.60	6.16	5.65	6.11	6.70	6.69	6.32	6.26	6.08
Generated	15.32	14.72	14.51	13.29	12.42	13.44	12.91	12.77	13.47	13.69

The total waste generation numbers include all waste – households, businesses, industries, and other manufacturing activities in our state. They also include wastes cleaned up from our environment, like 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. No higher or better uses of waste from environmental cleanups have been identified at this time, so they should be disposed in a landfill.

Much of the total waste stream are wastes that could be recycled or reused, or not created in the first place. These are wastes we need to focus prevention and reduction efforts on as described in the state's Solid and Hazardous 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.

2 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"

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 for what is disposed from Washington State in three municipal solid waste landfills in Oregon (Finley Butte, Wasco, and Columbia Ridge).

In 2014, a total of 9,672,186 tons were disposed. Table 4.3 shows the amounts and general types of waste disposed of since 2002 by Washington citizens[3]. Spreadsheets identifying the disposal location, type, and amount of waste for each county for 1994 - 2014 are at http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

[3] "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	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
MSW/ Commercial	4,703,879	4,805,202	4,917,870	5,060,502	5,258,076	5,309,296	4,978,497	4,614,045	4,548,275	4,377,843	4,396,880	4,486,592	4,590,330
Demolition	835,400	650,473	884,567	1,014,526	1,127,022	1,085,977	857,135	672,067	617,817	631,248	674,480	979,895	961,929
Industrial	546,299	743,042	1,356,415	1,092,305	512,277	530,835	361,017	277,691	446,521	279,215	270,862	261,345	495,423
Inert	321,451	280,358	419,115	1,337,372	1,029,559	1,402,421	1,362,143	552,682	986,335	525,016	1,050,917	1,198,015	1,582,108
Wood	91,697	90,303	89,905	61,918	52,833	40,579	39,926	29,449	8,822	9,726	23,828	21,200	70,621
ASH (other than SIA)	N/A	N/A	536,651	420,222	148,545	88,093	76,943	129,072	189,626	164,340	131,438	169,188	158,904
Sludge	1,762	22,835	10,171	12,458	33,490	30,432	35,682	16,550	1,985	419	480	1,252	7,807
Asbestos	11,177	15,455	18,252	21,951	29,700	103,686	11,914	12,654	12,683	13,677	11,898	11,026	16,193
Petroleum Contaminated Soils	784,703	568,681	489,385	957,788	740,341	735,773	1,057,069	786,762	766,381	582,541	741,542	933,702	1,124,448
Other Contaminated Soils	N/A	N/A	146,554	231,428	225,488	321,762	125,440	327,918	448,486	764,481	133,885	596,196	376,868
Tires[4]	4,919	22,226	15,212	22,446	33,698	50,704	25,541	28,834	23,275	14,156	14,866	15,690	19,425
Medical	2,417	2,498	2,624	2,651	2,899	3,998	3,013	2,983	11,618	7,064	8,252	9,398	10,401
Other	124,512	270,992	196,793	197,010	256,627	189,316	250,656	226,601	210,758	307,046	564,007	376,439	257,768
Total[5]	**7,428,216**	**7,472,065**	**9,083,516**	**10,432,576**	**9,450,554**	**9,892,871**	**9,184,975**	**7,677,306**	**8,272,583**	**7,676,711**	**8,009,780**	**9,059,940**	**9,654,089**

[4] In 2003 started adding tires that were reported disposed out-of-state.

In 2014, there was an overall increase in the amount of all solid waste disposed by Washington State citizens. There were significant increases in petroleum contaminated soils, inert wastes, and industrial wastes, and small increases in municipal/commercial solid waste. Decreases were seen in other contaminated soils and other wastes.

The types of wastes reported by landfills are very general, since the waste arrives in mixed loads and often in closed containers. It is difficult to know exactly what types of materials are included. For example, municipal solid waste as reported by disposal facilities includes 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 produced 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 waste reduction and recycling efforts for a particular type of waste or waste producer to have more details. Rigorous sampling studies, such as a waste characterization study, provide information to estimate the content of disposed waste.

The most recent of these studies, the *2009 Washington Statewide Waste Characterization Study*, was completed in June 2010. A comprehensive analysis of the overall waste stream and the commercial, residential, and self-hauled sectors is addressed in the study at http://www.ecy.wa.gov/biblio/1007023.html.

As we continue to implement the State Solid and Hazardous Waste Plan, specific information on the contents of our waste is essential to understanding the makeup of the solid waste stream. This helps us focus efforts to eliminate and reduce specific types of wastes or materials, and to measure our progress.

Municipal Solid Waste (MSW) Generation, Recycling & Disposal

The discussion of the solid waste generation, disposal, recycling, and diversion totals in the previous section includes *all* types of waste disposed, composted materials, source-separated materials burned for energy, and non-municipal solid waste diverted from disposal or recycled. The following discussion is of the narrower subset of recycling, disposal, and generation measures that include *only the MSW stream*, or discards from households and businesses.

In 1989, the Washington State Legislature amended the *Solid Waste Management Act* (Chapter 70.95 RCW) to set a state recycling goal of 50 percent by 1995. The 50 percent rate refers to the MSW recycling rate. To determine this rate and ensure consistency and comparability with past years, Ecology has measured a specific part of the solid waste stream since 1986. It is roughly the part of the waste stream defined as MSW by the U.S. Environmental Protection Agency.[6]

The law also states that recycling should be at least as affordable and convenient to citizens as garbage disposal. In response, local governments put various forms of recycling in place, ranging from drop boxes to curbside collection of a variety of recyclable materials.

Despite 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 the 50 percent goal to 2007, which the state did not meet until 2011. Legislators also set a goal to establish programs to eliminate yard waste in landfills by 2012.

Although Washington did not achieve the legislative goals by the set dates, the recycling rate increased steadily as infrastructure and markets developed. In 2012, 87.4 percent of the state's population had access to curbside recycling for materials such as paper, plastic, and metals. This was an increase from 86.5 percent with access to curbside recycling in 2011, and an increase over the original 82 percent when first measured in 2000. Despite the economic recession that caused severe cutbacks to the recycling infrastructure on the local government level, citizens recycled at a higher rate than in 2010. In 2011, Washington's recycling rate grew to its highest level ever at 50.7 percent, surpassing the 50 percent goal set by the Legislature. The recycling rate fell to 50.1 percent in 2012, yet remained above the 50 percent goal for the second year in a row. The recycling rate fell again in 2013 and 2014, dropping below the 50 percent goal down to 46.75 percent.

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 separately from other wastes, specifying county of origin, which provides a reliable data source for the denominator.

Recycling Rates for MSW

Ecology has conducted a survey every year since 1986 to measure the statewide recycling rate for MSW. Information comes from local governments, haulers, recyclers, brokers, and other handlers of materials from the recyclable portion[7] of the waste stream.

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[6] 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.

[7] *Ibid.*

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 4.4 shows MSW recycling rates for 1986 - 2014.

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 increased enough to drop the recycling rate to 33 percent.

Table 4.4
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%
2010	49%
2011	51%
2012	50%
2013	49%
2014	47%

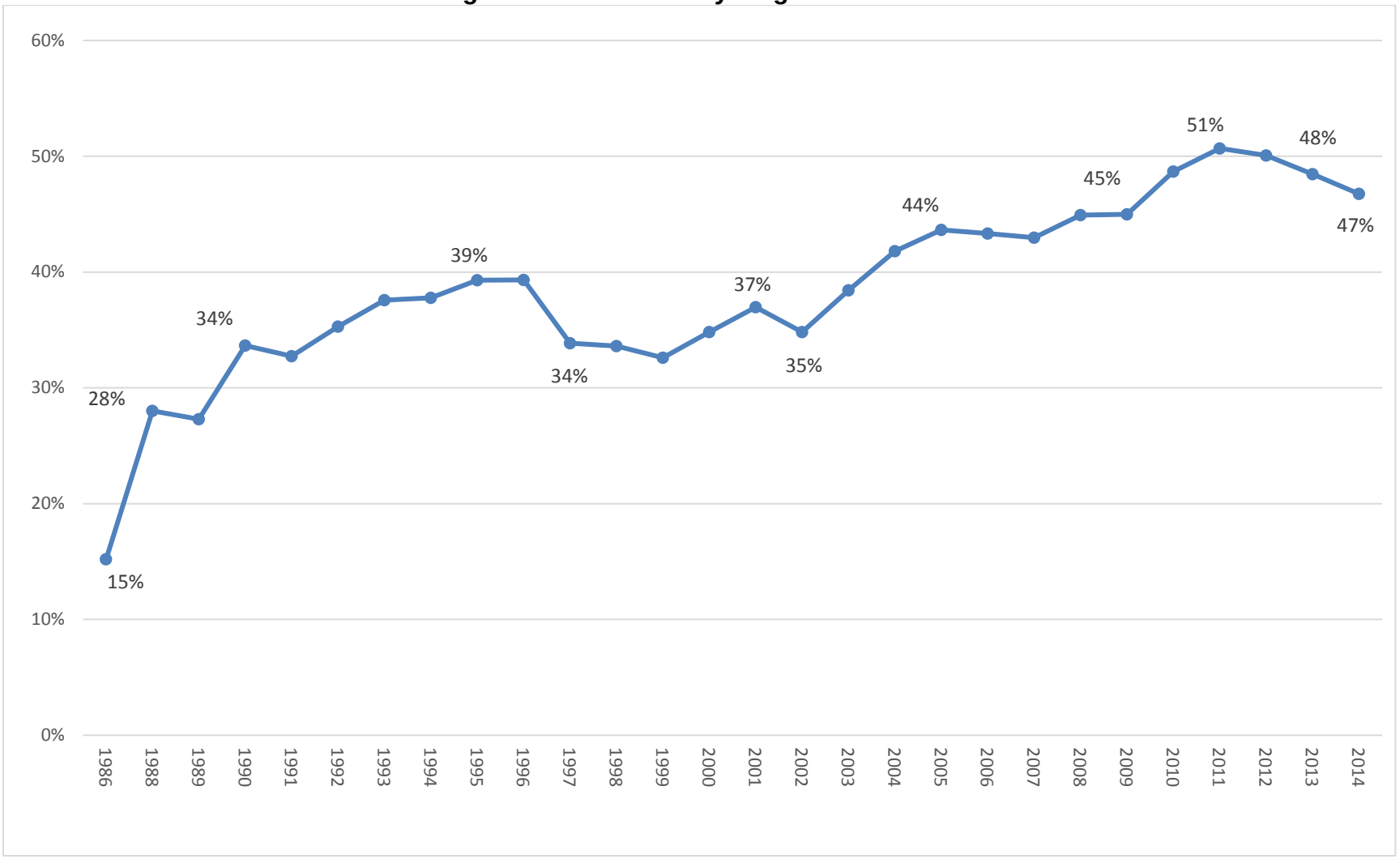
Markets continued to improve in 2000, raising the recycling rate again to 35 percent. Although markets for most materials fell in 2001, the increased activity and better reporting for key materials brought the rate to 37 percent. Drops in market conditions for paper, glass, and yard debris, combined 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, market demand for ferrous and nonferrous metals was high during 2003, which helped bring 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 remained unchanged in 2007. The economic recession that began around 2008 brought a reduced disposal rate; that and continued good recycling habits boosted the recycling rate to 45 percent in 2008, where it remained in 2009. In 2010, MSW disposal decreased again while recycling increased, bringing the recycling rate up to 49 percent. In 2011, this trend continued, resulting in a 51 percent recycling rate, the highest rate ever. Since then, the total amount of material recycled has dropped every year while the amount disposed has increased resulting in a steadily declining recycling rate.

Detailed data on materials recovery since 1986 is available at http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

Figure 4.4
Washington State MSW Recycling Rate - 1986 to 2014



As of 2012, about 87 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, having added one million people since 1999. 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 comingled or single-stream (mixed) collection systems to reduce costs and increase collection of recyclables. This trend became more evident in 2003, as new sorting facilities and procedures began operation, and has continued through 2014. Some evidence suggests the convenience of not having to sort recyclables leads to more participation in recycling programs. In most cases, programs that changed to comingled collection also increased the range of materials collected; however, the act of mixing or comingling the recyclables can create a higher residual rate because of the difficulty of cleanly sorting the materials. Those residuals are then disposed.

Compared to source-separated collection programs, the comingled programs have collected about ten percent more material. The results are also mixed where end markets are concerned. While the amount by weight collected in the recycling system is staying steady, a June 2010 Ecology report indicates that a certain amount of the residential comingled 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 – Tracking the Commingled Residential Recyclables from Southwest Washington* at http://www.ecy.wa.gov/biblio/1007009.html.

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 are 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

The Legislature requires Ecology to measure recycling activities each year and report the results. From 1986 until 2002, the only tool used was the annual recycling survey. Beginning in 2003, recycling facilities and intermediate solid waste handling facilities were required to submit annual reports under *Chapter 173-350 WAC, Solid Waste Handling Standards*. Annual reports for facilities are mandatory and they be penalized for not submitting a report.

Recycling facilities, other firms involved in recycling (such as brokers), haulers, and local governments submit information about the types and quantities of recyclable materials they collected. Although the recycling survey is mandatory, there is no penalty for not returning the information and not all businesses respond. Others respond with estimates of the amount and origin of materials. These factors offer challenges to compiling good county-specific recycling and diversion information.

To fill the gaps on reporting forms, Ecology cross-checks data through phone calls and e-mails to reporting facilities, end-users of the recyclable materials, other recycling facilities, other intermediate collectors of recyclables, and local governments. Other data sources are used to round out data gaps and check reported information, such as the data collected through E-Cycle Washington, the state's electronic waste product stewardship program. The data is also cross-checked with past years' aggregate data by material, county, and individual company.

Ecology also adjusts the collection numbers for materials that are reported as commingled. This practice began with 2009 data by applying a contamination rate based on local government sampling data. This method did not account for the residual material that is not sorted or is sorted incorrectly. For the 2011 analysis, Ecology began using another method to adjust the commingled data based on data from the *Beyond the Curb* report, and other local government and industry data. Ecology estimates how much of the commingled stream is made up of incoming contaminants and residuals left by the sorting systems, and subtracts that from the total amount reported. The adjusted number is then separated by material based on the percentage of material typically found in a commingled system.

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 surveys and forms. This data is verified by correspondence with the reporting facility, destination facility, and local government or industry to the extent possible. The destination data makes it possible to track materials as they move from facility to facility, allowing Ecology to remove instances where the materials are counted more than once.

Ecology bases the reliability of the results on review of draft numbers sent to local governments, comparisons to past recycling, waste characterization and disposal data, and industry and end-user information.

Both the recycling survey and annual reporting forms are available on Ecology's website. Respondents can print and complete the forms, or download, complete electronically, and email them to Ecology. Ecology maintains a solid waste facilities database as a central location for tracking recycling survey and annual report facilities, contact information, and data.

Results – 2014 MSW Recycling

To consistently compare results from year to year, Ecology includes basically the same materials it has used since 1986 to calculate the MSW recycling rate. These materials originate from the MSW stream Ecology defined when designing the recycling survey in the mid-1980s. Table 4.5 provides tonnage figures for each material that contributed to the MSW recycling rate from 2011-14.

Table 4.5
MSW Recycled Tonnage Reported
MSW Recycling Rates[8] 2011-14

Recycled Materials Reported (MSW)	2011	2012	2013	2014
Aluminum Cans	13,115	13,635	16,679	14,309
Appliances/White Goods	44,174	54,578	31,192	37,882
Batteries – Auto Lead Acid	27,297	23,356	2,744	19,198
Cardboard	542,333	520,585	534,494	497,912
Cartons	705	6,139	7,407	1
Container Glass	96,145	121,163	103,790	100,320
Electronics	31,148	38,237	32,694	37,068
Fats and Oils	128,511	86,864	125,799	74,265
Ferrous Metals	1,458,201	1,370,692	1,173,097	1,069,075
Fluorescent Light Bulbs	1,096	1,398	1,286	1,553
Food Scraps (post-consumer)	129,229	65,727	110,096	104,571
Gypsum	39,902	86,902	110,228	77,364
HDPE Plastics	12,475	16,864	16,720	13,744
High-Grade Paper	66,664	39,072	52,063	40,921
LDPE Plastics	27,024	23,375	20,022	22,303
Mixed Paper	280,055	293,424	293,932	327,342
Mixed Plastic	n/a	n/a	7,827	998
Newspaper	275,025	170,088	225,109	227,737
Nonferrous Metals	146,164	121,711	175,792	195,150
Other Recyclable Plastics	18,194	18,367	15,910	12,919
PET Plastic Bottles	16,986	18,830	24,029	22,360
Photographic Films	2,074	117	88	n/a
Rubber Materials	n/a	n/a	n/a	n/a
Steel Cans	17,975	15,306	19,552	17,326
Textiles (rags, clothing, etc.)	25,580	41,688	17,470	24,613
Tires (recycled)	25,678	25,756	20,951	24,292
Used Oil	76,612	74,114	54,936	69,457
Wood Waste	178,403	244,907	167,002	200,658
Yard Debris	608,947	656,841	616,800	556,102
Yard Debris and Food (mixed)	209,364	261,221	216,407	239,788
Total MSW Recycled	**4,499,073**	**4,410,955**	**4,219,306**	**4,029,229**
Total MSW Disposed[9]	**4,377,843**	**4,396,880**	**4,486,592**	**4,590,290**
Total MSW Generated	**8,876,917**	**8,807,835**	**8,705,898**	**8,619,519**
MSW Recycling Rate	**50.68%**	**50.08%**	**48.46%**	**46.75%**

[8] Detail may not add due to rounding.

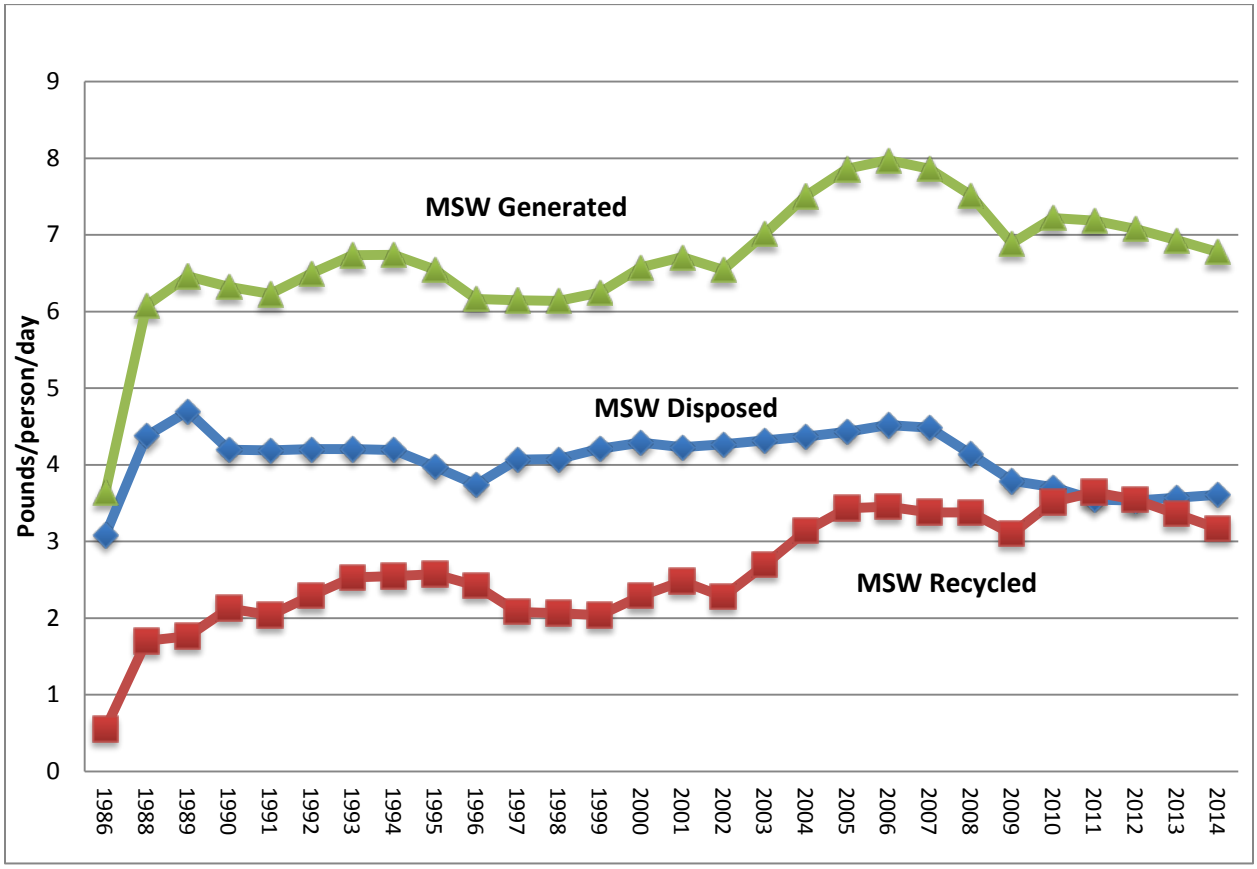
[9] The amount of MSW disposed represents only the quantity defined "recyclable portion" of the waste stream from municipal and commercial sources. It excludes the following waste types reported from landfills and incinerators: demolition, industrial, inert, wood, ash, sludge, asbestos, contaminated soils, tires, medical and other.

Individual Waste Generation for Municipal Solid Waste Stream

Each person contributes to the MSW stream by recycling and disposing of wastes from their household, school, workplace, and anywhere else solid waste is produced. The figures below represent only an average of the total contributions of all residents. Some people may contribute much more or less waste than others. Figure 4.5 shows an average of how each person in the state contributes to the MSW stream. The next section has a discussion of overall waste generation.

In 2014, each resident of the state generated 6.78 pounds of municipal solid waste per day, disposing 3.61 pounds per person. 3.17 pounds per person were recovered for recycling. In 2006, we reached an all-time high of per capita waste generation of 7.97 pounds per person per day. Since then, the waste generation has generally decreased, with only a slight increase from 2009-10 (see Table 4.6).

Figure 4.5
Pounds of MSW Disposed, Recycled
& Generated Per Person/Day
1986 - 2014



Washington residents create, recycle, and dispose of about two pounds of MSW per person above the national averages. We attribute this larger disposal number to Washington's larger amount of yard and wood waste than the national average, as well as our 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. This way, Ecology captures and measures any new recycling and diversion that occurs.

Table 4.6
Pounds MSW Disposed, Recycled and Generated Per Person/Day[10]
2003-14

MSW Per Capita	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Disposed	4.32	4.37	4.43	4.52	4.48	4.14	3.79	3.71	3.54	3.53	3.57	3.61
Recycled	2.69	3.14	3.43	3.46	3.38	3.38	3.10	3.51	3.64	3.55	3.36	3.17
Generated	7.01	7.51	7.86	7.97	7.86	7.52	6.89	7.22	7.19	7.08	6.93	6.78

[10] See the *Per Capita Waste Generation* section for per capita numbers that include diversion and all waste types.

Waste Recycled and Diverted from Disposal

Measuring Recycling and Diversion Rates

Since 1986, Ecology has calculated a consistent recycling rate that is comparable to past years by measuring the part of the waste stream known as MSW. 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 called diversion.

Increasingly, Washington counties and cities have put efforts into recovering and recycling 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 others. Knowledge of the non-MSW waste stream is increasing, and more materials are tracked as recyclers are discovering ways to divert this material from landfills.

Measuring diverted materials is as simple as collecting the number of tons of material diverted from landfills from the recycling and diversion facilities. Before 1999, many recycling survey respondents voluntarily listed this information on the recycling survey. In 1999 Ecology began asking recyclers to list and quantify the diverted materials on their reporting forms.

Ecology calculates a diversion rate (or recovery rate) in addition to 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 MSW recyclables. Ecology then compares the resulting figure to total waste generation (minus a subset of landfilled materials that were not available for recycling or diversion).[11] Washington shows a diversion rate of 49 percent in 2014 (Table 4.7).

Table 4.7
Diversion Rates
1999 - 2014

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%
2010	54%
2011	57%
2012	52%
2013	51%
2014	49%

Wood waste makes up a large portion of the recovered materials stream in Washington. A major portion of recovered wood is eventually burned for energy recovery. A percentage of it is also used in new wood and paper products, as a feedstock in composting operations, and as mulch. Although Ecology asks recycling facilities to report the final use of the material

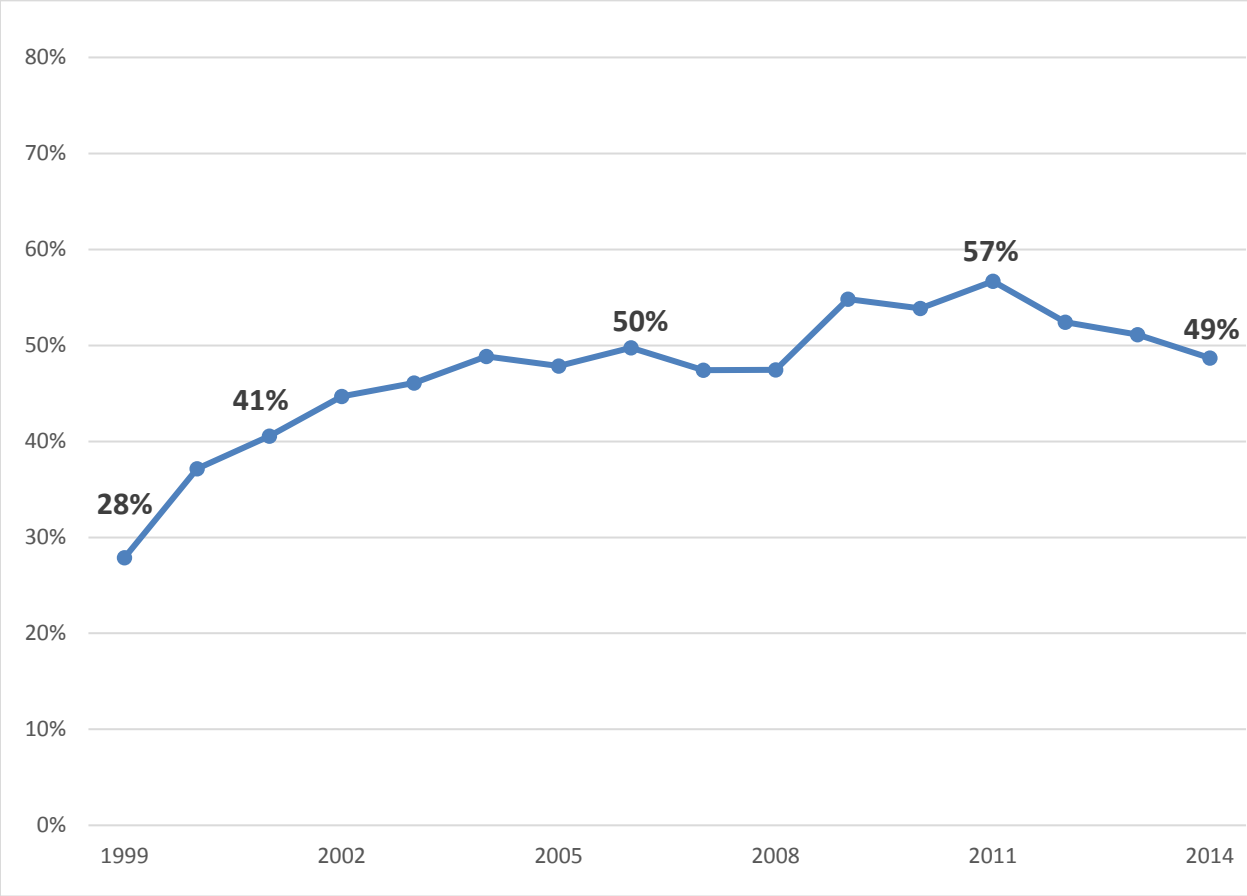
[11] Waste types used to calculate diversion include municipal, demolition, inert, industrial, wood, tires, medical and other. Excludes asbestos, sludge and contaminated soils.

(recycled, composted, burned for energy), facilities may not know the exact final use of the material. Therefore, an undetermined amount of the wood reported as recycled may actually be burned for energy recovery or used as hog fuel.

In agriculture, leftover organic materials are often 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. In addition, waste materials such as manure that are processed by anaerobic digesters are counted as diverted.

Figure 4.6 shows the diversion rate in Washington since Ecology began measuring it in 1999.

Figure 4.6
Washington State Diversion Rates – 1999 to 2014[12]



We need to study the non-MSW waste stream in more detail. We lack information on the total volume of waste created, especially in the industrial sector. If a recycling facility has a solid waste permit or is conditionally exempt from permitting under *Chapter 173-350 WAC, Solid Waste Handling Standards*, they are required to report the annual quantities and county of origin of solid waste recyclables collected or diverted from the waste stream. However, if the facility is

[12] Diversion rates are adjusted retroactively each year to reflect adjustments in recycling, diversion, and disposal data.

not required to have a solid waste permit or conditional exemption from permitting, reports are voluntary, as with out-of-state facilities or recycling haulers with no fixed facility. This makes it difficult to calculate a recycling or diversion rate for many materials.

Results – 2014 Diversion

Diversion is the term used to measure more materials than the traditional MSW recycling rate. It continues to include the same materials used since 1986 to calculate the MSW recycling rate, and also includes the new materials described in the above section on Measuring Recycling and Diversion Rates (e.g. construction and demolition debris and wood burned for energy recovery). Table 4.8 provides tonnage figures for each material included in the diversion rate from 2011-14.

Table 4.8
Diverted & Recycled Materials Reported (Tons); Diversion Rates

Diverted & Recycled Materials Reported	2011	2012	2013	2014
Agricultural Organics[13]	76,645	102,733	97,270	66,660
Aluminum Cans	13,115	13,635	16,679	14,309
Antifreeze	4,872	6,797	4,804	4,955
Appliances/White Goods	44,174	54,578	31,192	37,882
Ash, Sand & Dust used in Asphalt Production	-	-	-	-
Asphalt & Concrete	2,211,889	1,887,580	2,196,139	2,389,936
Batteries – Auto Lead Acid	27,297	23,356	21,744	19,198
Cardboard	542,333	520,585	534,494	497,912
Carpet and Pad	3,653	2,420	4,341	7,461
Cartons	705	6,139	7,407	1
Construction & Demolition Debris	271,716	399,209	343,523	233,608
Container Glass	96,145	121,163	103,790	100,320
Container Glass (used as aggregate)	19,966	20,116	123	11,893
Electronics	31,148	38,237	32,694	37,068
Fats and Oils[14]	128,511	86,864	125,799	74,265
Ferrous Metals	1,458,201	1,370,692	1,173,097	1,069,075
Fluorescent Light Bulbs	1,096	1,398	1,286	1,553
Food (recovered)	429	3,684	6,632	804
Food Processing Wastes (pre-consumer)	59,220	102,035	126,074	150,496
Food Scraps (post-consumer)[15]	129,229	65,727	110,096	104,571
Gypsum	39,902	86,902	110,228	77,364
HDPE Plastics	12,475	16,864	116,720	13,744
High-Grade Paper	66,664	39,072	52,063	40,921
Household Batteries	465	402	819	473
Industrial Batteries	1,620	1,582	1,806	1,970
Industrial Organics[16]	46,544	57,063	51,244	62,943
Industrial Paper	3,686	-	-	-
Land Clearing Debris	160,086	171,962	144,765	164,662
Land Clearing Debris for Energy Recovery	100,289	106,486	82,964	78,698
LDPE Plastics	27,024	23,375	20,022	22,303
Mattresses	1,213	852	668	259

[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	2011	2012	2013	2014
Miscellaneous	510	589	613	259
Mixed Paper	280,055	293,424	293,932	327,342
Mixed Plastic	-	-	7,827	998
Newspaper	275,025	170,088	194,412	227,737
Nonferrous Metals	146,164	121,711	175,781	195,150
Oil Filters	2,229	3,544	1,781	2,359
Other Fuels (Reuse & Energy Recovery)	175	-	-	-
Other Organics	149,510	126,096	112,840	100,885
Other Recyclable Plastics	18,194	18,367	14,580	12,919
Paint (Reused)	180	376	668	176
PET Plastics	16,986	18,830	21,333	22,360
Photographic Films	2,074	117	88	-
Post-Industrial & Flat Glass	1,230	3,661	1,605	65
Reuse (Clothing & Household)	15,050	5,455	2,593	19,181
Reuse (Construction & Demolition)	1,839	2,972	5,689	8,846
Reuse (Miscellaneous)	-	-	-	-
Roofing Material	15,470	13,021	10,899	8,272
Rubber Materials	-	-	-	-
Steel Cans	17,975	15,306	17,267	17,326
Textiles (Rags, Clothing, etc.)	25,580	41,688	17,470	24,613
Tires (Baled)	4,697	5,135	-	1,235
Tires (Burned for Energy)	10,450	10,443	19,392	11,421
Tires (Recycled)	25,678	25,756	20,157	24,292
Tires (Retread/Reuse)	7,813	7,059	8,442	6,512
Used Oil	76,612	74,114	53,914	69,457
Used Oil for Energy Recovery	2,409	3,432	11,019	14,557
Wood Waste	178,403	244,907	167,002	200,658
Wood Waste for Energy Recovery	519,075	323,474	367,574	322,182
Yard Debris	608,947	656,841	616,800	556,102
Yard Debris and Food (mixed)	209,364	261,221	216,407	239,788
Yard Debris for Energy Recovery	72,709	81,337	35,968	31,236
Total Diverted + Recycled Materials	**8,264,709**	**7,860,471**	**7,891,561**	**7,731,233**
Total Waste Disposed	**6,315,653**	**7,135,530**	**7,519,539**	**8,146,869**
Total Waste Generated	**14,580,362**	**14,996,001**	**15,379,101**	**15,878,474**
Diversion Rate	**56.68%**	**52.42%**	**51.11%**	**48.69%**

Waste Diversion Benefits

Waste prevention and diversion from landfill disposal (or recycling) are important 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 used 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 result in lower greenhouse gas emissions 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 2014 reduced greenhouse gas emissions by about 2.8 million tons (MTCE) or 810 pounds per person. The 7.7 million tons of material diverted from disposal in Washington in 2014 saved more than 118 trillion British thermal units of energy. This is similar to conserving one billion gallons of gasoline – enough to power one million homes for a year (nearly half the households in Washington). [17]

[17] 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.gov/state/seds/seds-data-fuel.cfm?sid=US.

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, 7,909,770 tons of waste were disposed in all types of landfills and incinerators in Washington in 2014 (Table 4.9).

Table 4.9
Total Amounts of Solid Waste Disposed in Washington

Disposal Method	2006	2007	2008	2009	2010	2011	2012	2013	2014
Municipal Solid Waste Landfills	5,398,008	5,354,005	5,157,547	4,775,888	4,875,010	4,925,583	4,565,487	5,006,787	5,395,183
Incinerated Waste	326,584	312,006	297,832	277,101	288,208	263,812	265,177	255,577	258,706
Inert / Demolition Landfills	1,231,565	1,708,445	1,261,131	693,349	966,184	791,132	1,042,558	1,291,573	1,638,252
Limited Purpose Landfills	760,088	600,928	623,063	624,575	738,952	644,431	717,787	968,756	617,630
Total	**7,716,245**	**7,975,444**	**7,339,573**	**6,370,913**	**6,868,354**	**6,624,958**	**6,591,009**	**7,522,693**	**7,909,770**

Municipal Solid Waste Landfills

Amount of Waste Disposed of in Municipal Solid Waste Landfills

In 2014, 14 municipal solid waste landfills accepted waste totaling 5,395,183 tons.[18] Of the 14 landfills, 11 were publicly owned and 3 privately owned. Table 4.10 shows the relationship of waste disposal to public/private ownership. As the table illustrates, 1,834,919 tons of solid waste disposed went to publicly owned facilities (34 percent), with the remaining 3,560,264 tons going to private facilities (66 percent).

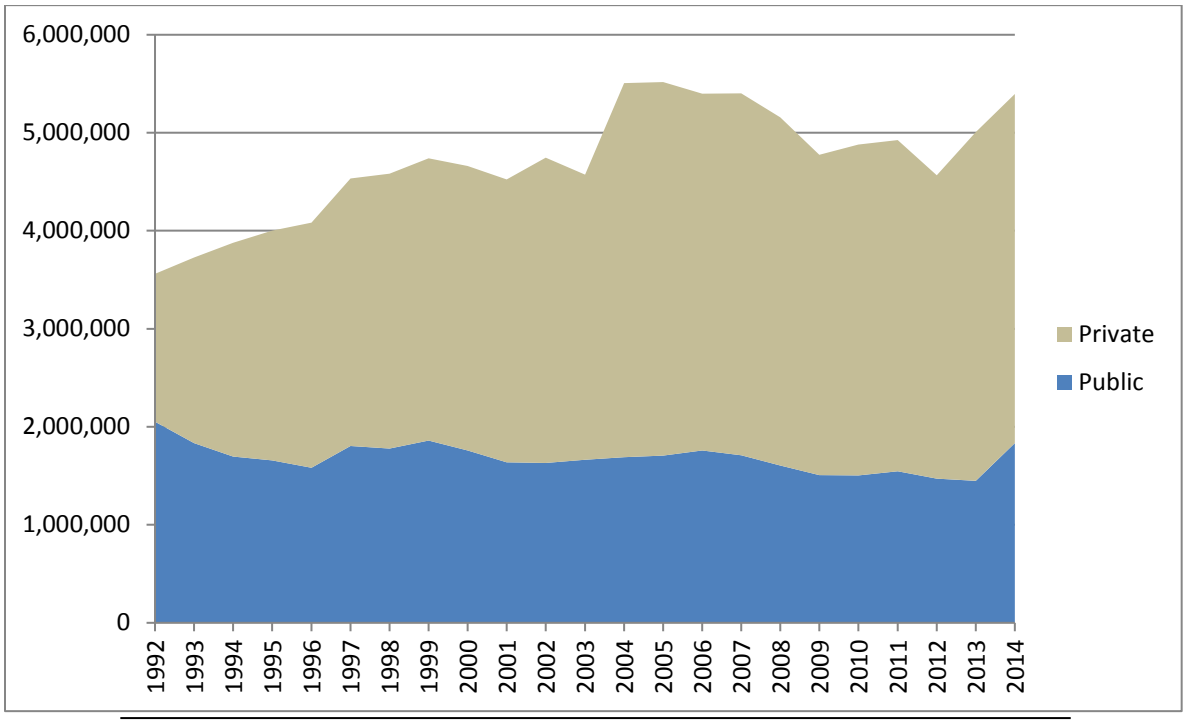
[18] Throughout this report, different disposal amounts are discussed. These numbers vary based on the types of facilities discussed, source of the waste and purpose of the discussion. For example, the recycling survey only accounts for "traditional" municipal waste in the disposed amount used to calculate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

Table 4.10
Waste Disposed in MSW Landfills – Public/Private

Ownership	Number of MSW Landfills		Amount of Waste Disposed (Tons)		% Total Waste Disposed	
	1991	2014	1991	2014	1991	2014
Public	36	11	2,696,885	1,834,919	69	34
Private	9	3	1,192,207	3,560,264	31	66
Total	**45**	**14**	**3,889,092**	**5,395,183**	**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 tracking this type of information. The amount of waste disposed in the private facilities has increased from 31 percent since 1991 to 66 percent in 2014. The private Roosevelt Regional Landfill in Klickitat County and LRI 304th Street Landfill in Pierce County 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.[19] 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 2014, see http://www.ecy.wa.gov/programs/swfa/solidwastedata/. Table 4.11 shows changes in waste, types, and amounts disposed in MSW landfills from 2005 - 2014.

[19] "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 4.11
Waste Types Reported Disposed in MSW Landfills (Tons)

Waste Types	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Municipal / Commercial[20]	3,631,873	3,787,080	3,847,352	3,637,010	3,435,505	3,383,984	3,261,582	3,282,962	3,403,743	3,469,501
Demolition Waste	541,945	551,572	532,409	363,343	260,500	254,453	307,815	320,939	364,476	462,133
Industrial Waste	624,958	182,661	131,167	130,929	115,390	164,755	102,842	99,569	117,372	270,949
Inert Waste	15,780	15,842	22,491	11,055	6,387	6,672	7,903	4,668	3,635	50,483
Wood	9,896	4,462	71	18	424	206	574	676	332	45,875
Ash (other than SPI)	2,857	2,432	3,959	2,102	1,096	1,907	1,663	1,629	1,838	66,646
Sewage Sludge	12,476	21,303	6,703	7,892	15,732	2,455	2,033	2,544	3,092	930
Asbestos	7,943	5,633	5,379	4,308	4,975	4,996	6,574	7,570	5,156	11,469
Petroleum Contaminated Soils	320,283	455,964	326,019	693,719	515,567	476,368	426,085	283,212	485,734	501,447
Other Contaminated Soils	212,692	224,608	295,930	119,711	232,673	391,868	74,568	91,059	352,256	330,314
Tires	6,942	8,525	11,797	13,162	8,151	9,750	6,413	6,201	5,447	4,361
Medical	2,576	2,721	2,805	2,932	2,907	12,109	8,726	10,484	11,801	12,321
Other [21]	127,121	135,206	167,933	171,366	176,581	168,720	718,805	453,972	251,906	168,754
Total	**5,577,342**	**5,398,008**	**5,354,005**	**5,157,547**	**4,775,887**	**4,878,241**	**4,925,583**	**4,565,487**	**5,006,787**	**5,395,183**

[20] Some facilities include demolition, industrial, inert, commercial and other small amounts of waste types in the MSW total.
[21] Some of the "other" types of waste reported include auto fluff, special waste, vactor waste, street sweepings, and catchment basin and detention pond sediments.

Future Capacity at Municipal Solid Waste Landfills

Fourteen MSW landfills are 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 April 2015, the facilities estimated about 324 million tons, or about 60 years of capacity at the current disposal rate, a decrease from 2014.

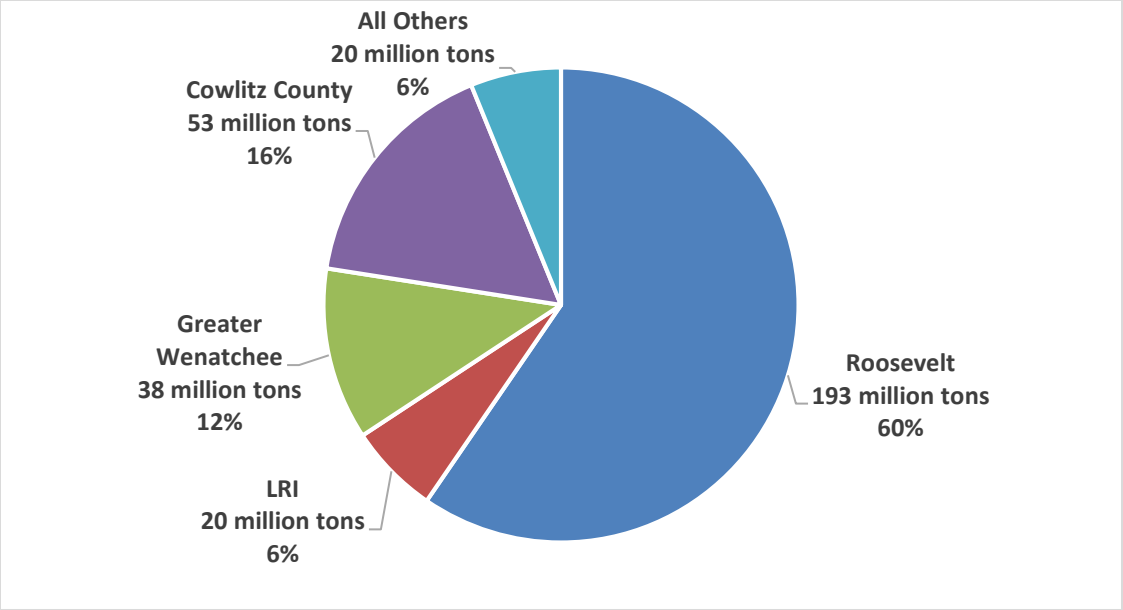
Changes in permit conditions, construction of new landfill cells, and changing volumes affect remaining capacity. Of the 14 currently operating landfills, 11 have more than 10 years of remaining permitted capacity. Capacity numbers in 2015 indicated more than 98 percent of remaining capacity was at landfills with more than 10 years before closure.

Eleven of the 14 operating MSW landfills are publicly owned, with about 23 percent of the remaining capacity (73 million tons). About 77 percent of the remaining permitted capacity (250 million tons) is at the three privately owned facilities, compared to 73 percent in 1993.

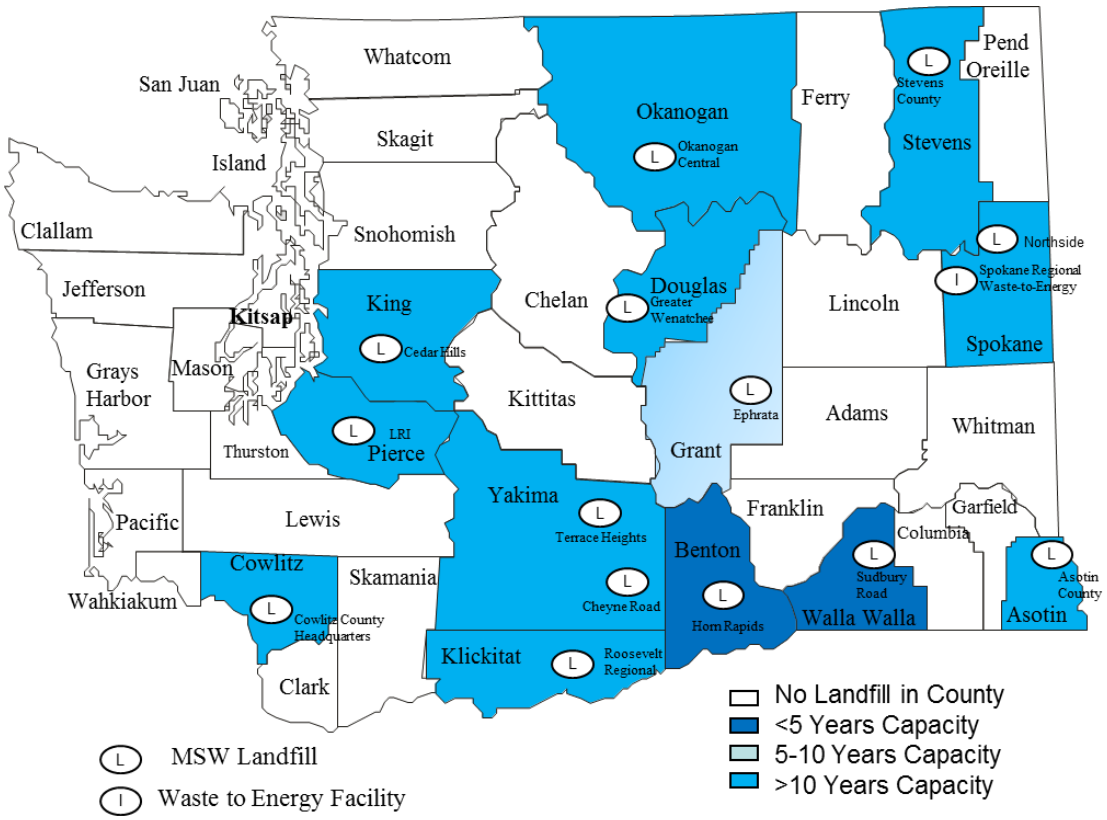
Cowlitz County closed their municipal solid waste landfill in late 2013. The county purchased the Headquarters Road Limited Purpose Landfill from Weyerhaeuser and has brought the landfill into compliance with *Chapter 173-351 WAC, Criteria for Municipal Solid Waste Landfill Standards*. It was permitted as a municipal solid waste landfill and began accepting MSW waste in 2014. This facility has increased the available capacity for public landfills in the state.

The majority of the capacity, 59.6 percent of the total statewide capacity, is at the privately owned Roosevelt Regional Landfill in Klickitat County. Two other private landfills have the next largest remaining capacity: Greater Wenatchee (12 percent) and LRI in Pierce County (6 percent). Cowlitz County, owned by the county, has 16.5 percent of the remaining capacity. The other 10 publicly owned landfills have 6.2 percent of the remaining statewide capacity (see Figure 4.8). Map 4.A shows the locations and remaining years of capacity of MSW landfills.

Figure 4.8
2014 Remaining Permitted Capacity at MSW Landfills



Map 4.A
Location of MSW Landfills & Energy Recovery Facilities and Remaining Capacity (as of April 2015)



Besides of 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. In 2014, the facility received some type of solid waste from 28 counties in Washington, including the majority of the solid waste from 16 counties. They also received waste from Alaska, Oregon, Idaho, and British Columbia.

For counties that do not have landfills, Roosevelt or the Oregon landfills have become their disposal options. 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 non-municipal waste disposal needs.

Ecology bases its 60-year estimate of total remaining permitted capacity on the amount of waste disposed in MSW landfills in 2014. 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 imported into the state for disposal, or a shift to in-state disposal of waste currently exported. Cleanup activities, such as dredging contaminated sediments from Puget Sound, will add large volumes to the disposal totals.

Waste-to-Energy/Incineration

The Spokane Regional Waste-to-Energy Facility burned 258,706 tons of solid waste. It is the only incinerator in the state that burns municipal solid waste.

MSW Landfill Disposal vs. Incineration

Table 4.12 compares the amount of solid waste disposed in MSW landfills, and waste-to-energy facilities and incinerators in 2014.

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

Table 4.12
Waste Disposed in MSW Landfills and Incinerators in 2014

Facility Type	Tons	Percent
MSW Landfills	5,395,183	95%
Incinerators	258,706	5%
Total	**5,653,889**	**100%**

In 2014, about five percent 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. See Map 4.A for the locations of MSW landfills and energy-recovery facilities in Washington.

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 2014, the Spokane Waste-to-Energy Recovery facility, the only facility of this type in the state, sent 66,618 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 wood waste landfill and inert/demolition landfill types no longer exist. Inert waste is now narrowly defined for disposal in an *inert* landfill. Demolition waste is no longer accepted at inert landfills. Landfills accepting demolition or wood waste 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 a more consistent look at inert landfills over time, some waste categories were combined for Table 4.13.

Table 4.13
Waste Types and Amounts Disposed at Inert Landfills (in Tons)[22]

Waste Types	2006	2007	2008	2009	2010	2011	2012	2013	2014
Demolition	89,595	89,457	-	-	-	-	-	-	-
Industrial	-	2,150	1,940	799	945	1930	399	-	-
Inert	973,855	1,324,663	1,250,973	604,196	929,578	574,291	1,024,930	1,172,486	1,472,026
Wood	610	-	-	-	-	-	-	-	-
Asbestos	-	-	-	-	-	-	-	-	-
Ash (other than SPI)	7,497	7,052	7,680	6,320	5,311	5,029	6,038	-	-
PCS	91,399	277,812	-	-	-	-	-	-	164,505
Contaminated soils (other)	-	-	-	81,074	28,363	136,586	10,266	118,000	-
Tires	-	-	-	-	-	-	-	-	-
Other	68,609	7,311	538	960	1,951	1,296	915	1,087	1,721
Total Tons	**1,231,565**	**1,708,445**	**1,261,131**	**693,349**	**966,148**	**791,132**	**1,042,558**	**1,291,573**	**1,638,252**

[22] 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 4.14 shows waste types disposed in Limited Purpose Landfills.

Table 4.14
Waste Types and Amounts Disposed at Limited Purpose Landfills (in Tons)

Waste Types	2006	2007	2008	2009	2010	2011	2012	2013	2014
Demolition	215,543	245,604	255,098	254,824	221,043	222,163	260,328	449,104	365,910
Industrial	257,297	173,992	149,978	113,636	157,960	124,392	133,513	-	22,413
Inert	39,928	48,784	100,115	27,335	43,322	25,259	21,092	23,248	62,935
Wood	19,629	11,702	18,210	11,608	8,823	9,373	23,325	20,900	24,634
Ash (other than SPI)	138,616	77,082	65,117	121,329	180,620	155,923	122,178	20,900	90,170
Sludge	-	460	460	460	-	-	-	-	-
Asbestos	1,420	1,374	1,614	2,313	2,357	1,544	2,038	1,694	1,945
PCS	32,836	20,656	11,398	75,275	96,639	31,390	130,494	157,762	15,713
Soils (uncont.)	29,006	-	-	-	9,327	53,419	-	-	-
Tires	423	65	35	122	30	128	97	141	728
Other	25,390	21,210	21,038	17,673	18,830	20,840	24,721	35,161	32,568
Total Tons	**760,088**	**600,928**	**623,063**	**624,575**	**738,952**	**644,431**	**717,787**	**968,756**	**619,570**

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 outside their counties. Eight of the 14 active MSW landfills reported receiving solid waste from other counties in 2014.

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 petroleum contaminated soils, 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 28 of the 39 Washington counties and also from out-of-state and out-of-country.

For many counties that still have operating MSW landfills, Roosevelt Regional Landfill or Columbia Ridge Landfill in Oregon have become options to dispose of some of their non-municipal waste, thus saving local landfill capacity for future need. Sixteen of the 28 counties rely on Roosevelt for the majority of their MSW disposal.

Nine counties and the city of Seattle send the majority of their MSW to Oregon facilities (WASCO, Finley Buttes, and Columbia Ridge). 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 2014 (and previous years) at http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

Waste Imported and Exported for Disposal

Landfills and incinerators also report the source, types, and amounts of waste received from out-of-state or out-of-country. In 2014, a total of 425,519tons of solid waste, about 5 percent of the waste disposed and incinerated in Washington, was imported from outside the state's boundaries for disposal at MSW landfills and energy recovery facilities. Waste was received from Alaska, Idaho, Oregon, and British Columbia with a very small amount from Montana and California.

A larger amount of solid waste was exported from Washington to Oregon for disposal. In 2014, a total of 2,168,838 tons of waste created in Washington were disposed of in Oregon landfills. Table 4.15 compares the waste amounts and types exported and imported.

Table 4.15
Comparison of Imported to Exported Waste for all Solid Waste Facilities

Type of Waste	Imported		Exported	
	1991	2014	1993	2014
Municipal Solid Waste	24,475	327,864	710,515	1,189,914
Demolition	1,412	41,840	2,245	175,726
Industrial	-	22,081	864	224,142
Inert	208	4,144	-	809
Wood waste	36	-	-	112
Ash (other than SIA)	-	-	-	1,548
Sludge	-	122	-	5,843
Asbestos	-	346	1,623	3,126
Petroleum Contaminated Soils	-	5,825	22,308	448,608
Other Contaminated Soils	-	689	-	47,338
Tires	-	3,867	-	18,137
Medical Waste	-	3,274	-	1,355
Other	-	14,370	18,512	70,250
Total	**26,131**	**425,519**	**756,067**	**2,186,909**

Major exporters of their MSW in Washington included the city of Seattle and Adams, Benton, Clark, Columbia, Franklin, Grays Harbor, Kitsap, Lincoln, Pacific, San Juan Skamania, and Whatcom along with portions of Mason, Snohomish, and Walla Walla counties. Small amounts of non-municipal solid waste were also exported from several counties.

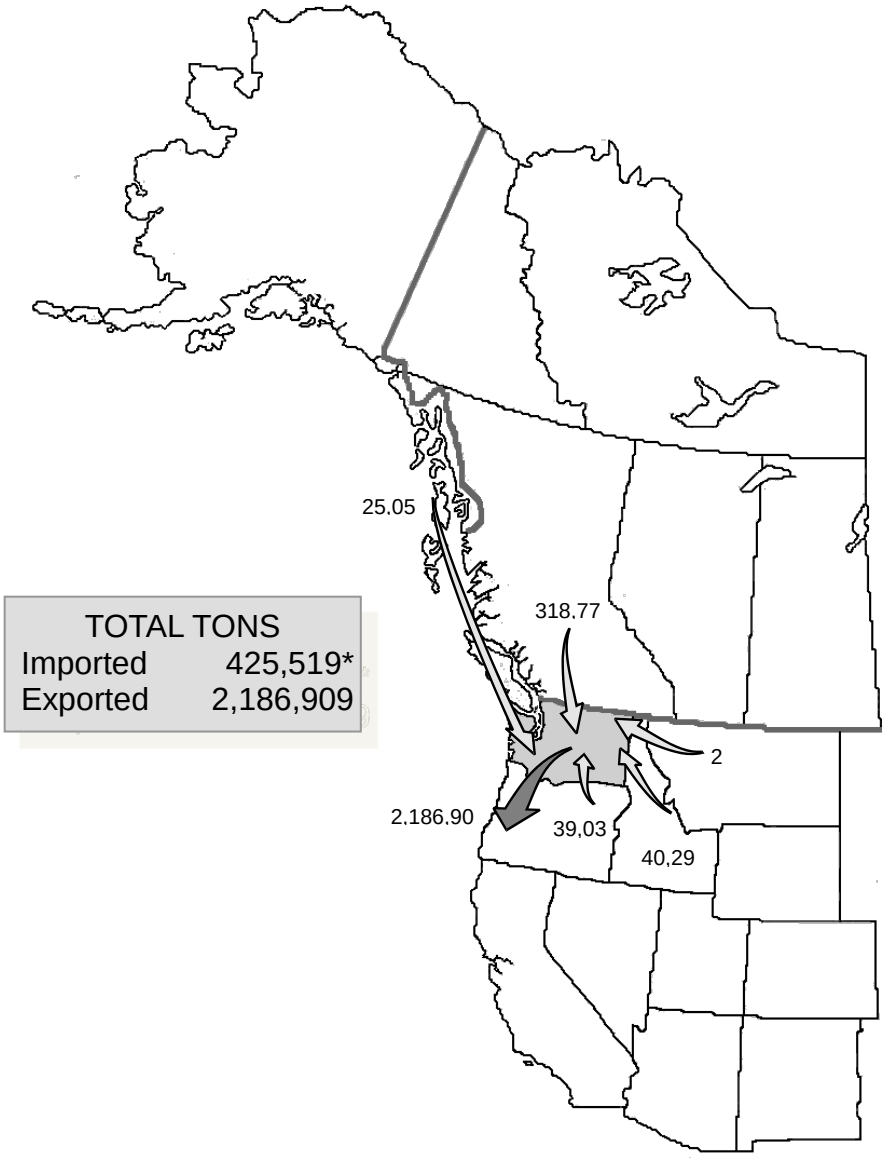
For the county details of waste types, amounts and final disposal locations and for imported and exported totals, see http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

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.

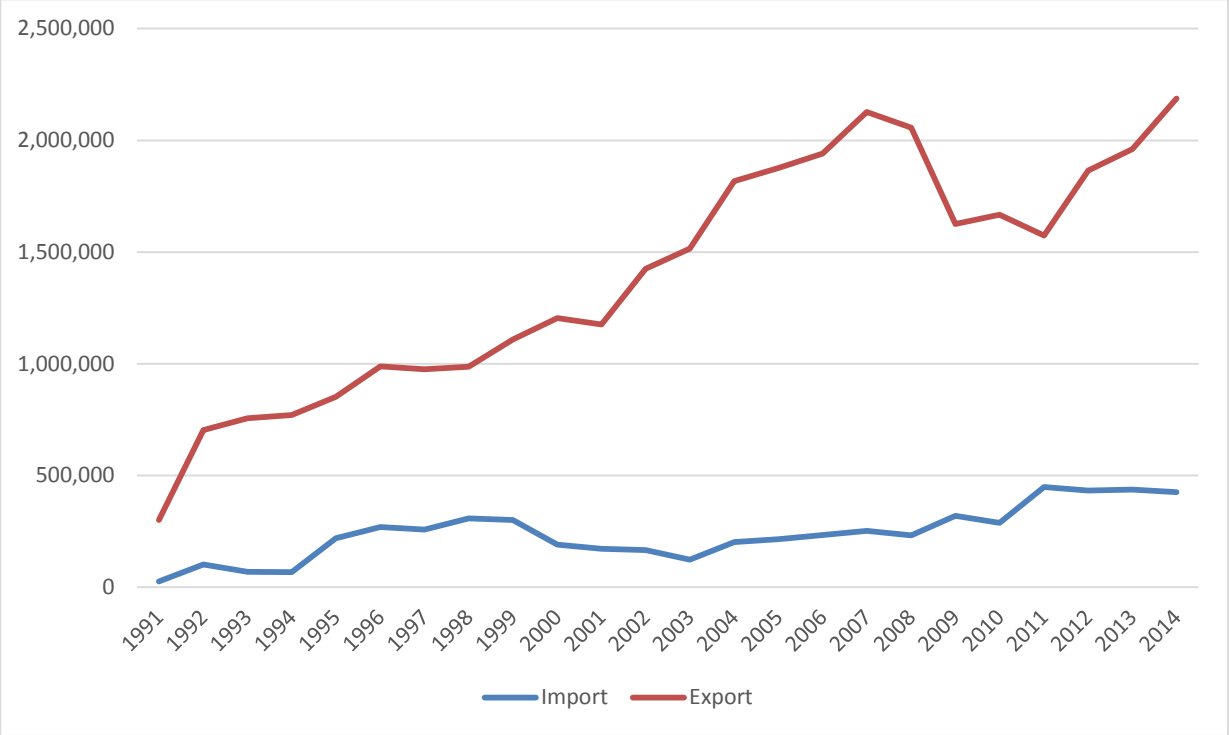
Map 4.B identifies the sources and amounts of waste that were imported and exported in 2014.

Map 4.B
Imported and Exported Waste (2014)

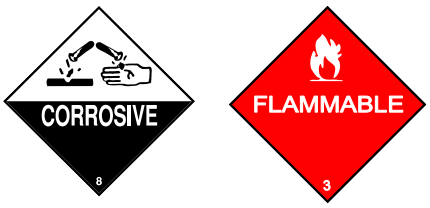


As shown in Figure 4.9, Washington exports have been much higher than imports since 1991. In 2014, about four times as much waste was exported to Oregon's landfills (Columbia Ridge, Wasco, and Finley Buttes) as what was imported to Washington for incineration or disposal.

Figure 4.9
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.

- The total MRW collected in 2014 was about 22.6 million pounds.
- The average amount of HHW disposed of per participant was 66.0 pounds, and per capita was 1.89 pounds.
- A little more than 3 percent of Washington residents used a fixed facility or collection event to remove hazardous waste from their households, about 7.4 percent of all households.
- Counties that publicly collected the most CESQG waste per capita were Yakima, Whatcom, Lewis, Kitsap, and Island.
- Counties that collected the most used oil per capita were Stevens, Skamania, Wahkiakum, Cowlitz and Asotin.
- Approximately 85 percent of all MRW collected 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. Over time, local collection programs have further developed with the addition of mobile units and satellite facilities to supplement fixed facilities. These efforts resulted in a larger number of customers served, decreased costs, and increased reuse and recycling of MRW.

Please note 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 funding to local governments for these purposes. CPG is funded by the Local Toxics Control Account (LTCA).[1] CPG funding requires a 25 percent match from local agencies.

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. However, the reported data can vary depending on a program's collection process, and how data is reported and interpreted. All programs must provide an individual MRW report. However, some programs do not meet this obligation, which can create gaps in the data.

2014 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, waste types received at collection events and fixed facilities, and disposition of wastes collected. 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 2014 data with some comparisons to data published in previous years' reports. In an effort to provide useful information for individual programs, data is provided in categories by county size.

In 2014, Ferry, Garfield, Mason, and San Juan Counties did not report any HHW collections. Private collectors or used oil collection programs provided the numbers shown in this report for these counties. Due to budget constraints, some counties decided to reduce hours of operations at their fixed facilities, or discontinued or reduced collection events.

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

Permanent fixed facilities now service most of the state. In 2014, Benton, Chelan, Douglas, Ferry, Garfield, San Juan, Skamania, and Wahkiakum counties did not have fixed facilities. Garfield residents can use the facility in Asotin County and Cowlitz County conducts a mobile event in Wahkiakum County. Benton, Chelan, Douglas, Ferry, San Juan, and Skamania counties normally conduct collection events, though some of these counties were unable to do so in 2014.

In past reports, Ferry County was shown to have a fixed facility, but the facility is more properly categorized as a limited MRW Facility. Benton County had a permanent fixed facility until about mid-2010 when the facility was destroyed by a fire.

Collection services for CESQGs have leveled off statewide. In 2014, 16 fixed facilities serviced CESQGs, and 2 counties provided a collection event for CESQGs.

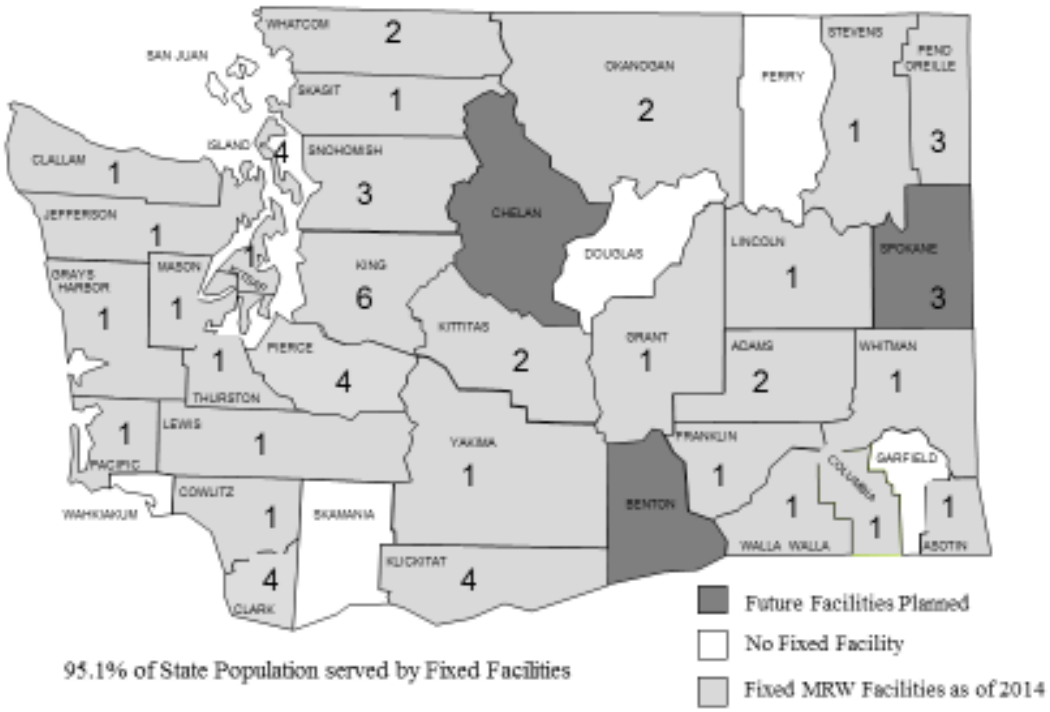
Table 5.1 shows the estimated population (based on data provided by the Office of Financial Management) by size of individual counties. In Washington State there are 42 programs that manage MRW. These programs include all 39 counties.

Table 5.1
Individual County Population by Size (2013)

< 50 K		**50 K – 100 K**		**> 100 K**	
Garfield	2,240	Walla Walla	60,150	Cowlitz	103,700
Wahkiakum	4,010	Mason	62,000	Skagit	119,500
Columbia	4,080	Clallam	72,500	Benton	186,500
Ferry	7,660	Grays Harbor	73,300	Whatcom	207,600
Lincoln	10,700	Chelan	74,300	Yakima	248,800
Skamania	11,370	Lewis	76,300	Kitsap	255,900
Pend Oreille	13,210	Island	80,000	Thurston	264,000
San Juan	16,100	Franklin	86,600	Clark	442,800
Adams	19,400	Grant	92,900	Spokane	484,500
Klickitat	20,850	**50 K – 100 K Total**	**678,050**	Snohomish	741,000
Pacific	21,100			Pierce	821,300
Asotin	21,950			King	2,017,250
Jefferson	30,700			**> 100K Total**	**5,892,850**
Douglas	39,700				
Okanogan	41,700				
Kittitas	42,100				
Stevens	43,900				
Whitman	46,500				
< 50K Total	**397,720**			**State Total**	**6,968,170**

Map 5.A shows which counties have permanent fixed facilities, the number of fixed facilities in each county, and which counties are likely to develop a permanent fixed facility in the future. Six of the fixed facilities represented on the map are owned and operated by private companies, either managing their own wastes from multiple facilities at one consolidation point or only servicing CESQG customers.

Map 5.A
58 MRW Facilities as of 2014



MRW Collected

As shown in Table 5.2, Washington programs collected approximately 11.8 million pounds of HHW, 6.6 million pounds of used oil (UO), and 4.2 million pounds of CESQG waste, for a total of approximately 22.6 million pounds of MRW during 2014.

Table 5.2
Total Pounds per Waste Category 2005-14

Collection Year	HHW lbs (no UO)	Used Oil lbs	CESQG lbs	Total MRW lbs
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	12,257,316	8,916,633	4,867,334	26,041,283
2010	11,572,466	9,218,395	5,387,903	26,178,764
2011	10,965,429	7,857,614	4,977,625	23,800,668
2012	11,303,293	7,417,694	4,424,536	23,145,523
2013	12,722,719	7,196,140	3,768763	23,687,622
2014	11,850,786	6,605,106	4,211,368	22,667,260

Collection by Waste Category and Type

As shown in Table 5.3, the waste types of MRW collected most in 2014 were non-contaminated used oil, antifreeze, paint related material, latex paint, oil-based paint, and flammable liquids. These totals include used oil and antifreeze collected at all collection sites. These six specific waste types accounted for approximately 66 percent of the estimated 22.6 million pounds of MRW collected in 2014.

Table 5.3
Six Most MRW Waste Types Collected in 2014

Waste Type	Total Lbs.
Non-Contaminated Used Oil	6,605,106
Antifreeze	2,890,528
Paint Related Material	1,592,049
Latex Paint	1,348,132
Oil-based Paint	1,306,012
Flammable Liquids	1,190,405
Total	**14,932,232**

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 2014

Waste Type	HHW	CESQG	Total
Acids	166,892	14,990	181,882
Acids (Aerosol Cans)	43	0	43
Aerosols (Consumer Commodities)	213,038	19,661	232,699
Antifreeze	651,097	2,239,431	2,890,528
Bases	284,127	16,579	300,706
Bases, Aerosols	107	4	111
Batteries (Auto Lead Acid)	623,130	13,061	636,191
Batteries (Small Lead Acid)	17,904	6,850	24,754
Batteries (Dry Cell)	394,086	73,521	467,607
Batteries (Nicad/NIMH/Lithium)	65,155	13,291	78,446
CFCs	14,468	11	14,479
Chlorinated Solvents	2,228	465	2,693
Compressed Gas Cylinders	6,154	308	6,462
CRT's	813,640	18,424	832,064
Cyanide Solutions	16	1	17
Dioxins	1	0	1
Electronics	1,181,118	8,500	1,189,618
Fire Extinguishers	20,718	1,694	22,412
Flammable Solids	22,071	13,005	35,076
Flammable Liquids	1,026,683	166,397	1,193,080
Flammable Liquids, Aerosols	819	0	819
Flammable Liquids Poison	206,822	8,001	214,823
Flammable Liquid Poison, Aerosols	67,147	51	67,198
Flammable Gas (Butane/Propane)	137,128	579	137,707
Flammable Gas Poison	53	0	53
Flammable Gas Poison, Aerosols	47,549	1,357	48,906
Latex Paint	1,287,180	72,288	1,359,468
Latex Paint, Contaminated	162,477	21,488	183,965
Mercury Compounds (Dental Amalgam)	96	10,035	10,131

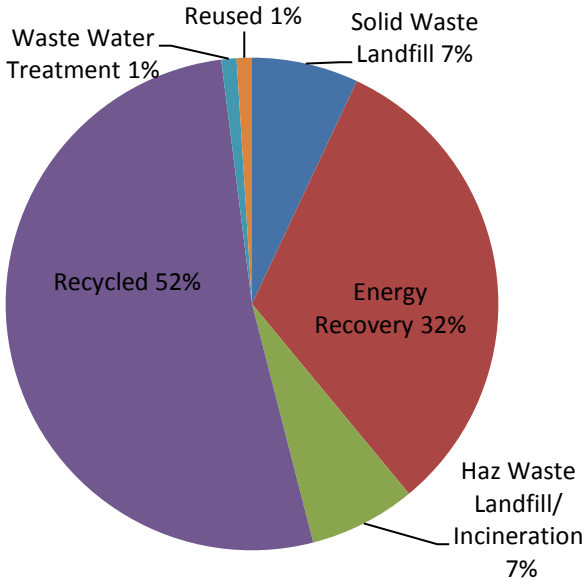
Waste Type	HHW	CESQG	Total
Mercury Containing Batteries (Button, etc.)	0	1	1
Mercury Devices (Monometers, Barometers, etc.)	83	12	95
Mercury (Fluorescent Lamps & CFLs)	445,996	239,742	685,738
Mercury (Pure Elemental)	1,774	25	1,799
Mercury (Switches & Relays)	0	0	0
Mercury (Thermostats/Thermometers)	376	231	607
Nitrate Fertilizer	7,580	8	7,588
Non-PCB Containing Light Ballasts	5,883	3,319	9,202
Non-Regulated Liquids	77,131	73,924	151,055
Non-Regulated Solids	170,019	415,488	585,507
Oil-Based Paint	1,169,079	136,933	1,306,012
Oil-Based Paint, Contaminated	204,262	6,467	210,729
Oil Contaminated (oily H2O, oil w/PCBs, etc.)	77,852	128,451	206,303
Oil Filters	144,064	3,900	147,964
Oil Filters Crushed	4,535	0	4,535
Oil Non-Contaminated	6,284,780	320,326	6,605,106
Oil Stained Rags, Absorbent Pads, etc.	2,886	4,417	7,303
Organic Peroxides	1,078	36	1,114
Other Dangerous Waste	37,014	199,239	236,253
Oxidizers	31,105	1,982	33,087
Paint Related Materials	1,363,606	235,199	1,598,805
PCB Containing Light Ballasts	16,960	4,966	21,926
Pesticide/Poison Liquid	342,275	10,355	352,630
Pesticide/Poison Solid	268,902	17,305	286,207
Photo/Silver Fixer	3,078	7,750	10,828
Reactives	2,403	39	2,442
Tar and/or Adhesives	24,452	1,587	26,039
Used Cooking Oil	36,446	0	36,446
MRW TOTAL	**18,135,566**	**4,531,694**	**22,667,260**

* 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 that most of it is HHW rather than CESQG. Therefore, since 2008 it has been included with the HHW total in Table 5.4 instead of the CESQG total as in the past.

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. Seven percent of all MRW is disposed at a hazardous waste landfill or incinerator. Figure 5.1 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 5.1
2014 MRW Final Disposition



MRW Data

Table 5.5 shows various data by county. HHW data is based on fixed facility and collection event information, but does not include HHW collected at limited MRW sites, as participation numbers are not tracked at these sites. The last column of this table represents all MRW collected in that county, including privately collected CESGQ wastes, used oil, antifreeze, and oil filters collected at limited MRW sites. 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 From Limited Sites Total lbs
Adams^	6,421	0	0%	$0	0.00	3,671	5,710
Asotin^	9,954	0	0%	$0	0.00	248,926	251,308
Benton	73,181	2,676	3.7%	$113.42	103.3	276,301	284,437
Chelan	36,651	950	2.6%	$75.66	111.8	106,215	175,835
Clallam	36,275	663	1.8%	$139.52	72.6	48,125	177,963
Clark	172,731	14,075	8.1%	$32.22	186.3	2,622,046	3,742,401
Columbia^	2,162	0	0%	$0	0.00	2,297	2,956
Cowlitz	44,003	2,223	5.0%	$70.10	416.5	925,824	1,220,240
Douglas	16,430	571	3.5%	$83.20	36.2	20,695	28,332
Ferry*	4,483	0	0%	$0	0.00	0	0
Franklin	26,597	362	1.4%	$18.70	10.2	3,690	374,538
Garfield*	1,238	0	0%	$0	0.00	0	3,679
Grant	36,341	365	1%	$137.87	169.4	61,816	113,168
Grays Harbor	35,634	1,975	5.5%	$167.40	60.6	119,727	252,540
Island	40,882	2,798	6.8%	$54.00	106.6	298,239	316,322
Jefferson	18,143	1,298	7.2%	$62.64	81.6	105,896	112,286
King	879,927	72,838	8.3%	$36.38	49.2	3,582,856	6,071,357
Kitsap	109,118	8,333	7.6%	$97.60	84.9	707,496	1,044,301
Kittitas	22,734	375	1.6%	$190.94	170.2	63,829	163,390
Klickitat	10,157	8,425	82.9%	$3.04	6.3	53,345	62,933
Lewis	34,682	1,087	3.1%	$132.34	300.00	326,724	404,665
Lincoln	5,911	390	6.6%	$37.60	150.3	53,390	62,855
Mason*	33,087	0	0%	$0	0.00	0	3,175
Okanogan*	22,808	0	0%	$0	0.00	0	4,128
Pacific	15,778	170	1.8%	$417.90	104.5	17,766	47,054
Pend Oreille	8,131	585	7.2%	$92.00	137.3	80,322	100,729
Pierce	334,783	11,468	3.4%	$87.50	69.7	799,218	1,272,156
San Juan*	13,664	0	0%	$0	0.00	0	4,000
Skagit	52,493	4,419	8.4%	$40.88	23.58	104,180	251,719
Skamania	5,791	289	5.0%	$93.78	125.6	36,285	78,190
Snohomish	297,613	11,243	3.8%	$55.90	77.6	872,669	1,752,731
Spokane	207,421	11,126	5.4%	$26.64	65.6	730,360	1,859,149
Stevens	21,461	192	.9%	$159.48	320.4	61,519	247,163
Thurston	113,281	15,375	13.6%	$24.70	15.6	240,410	586,099

County	Housing Units	HHW Participants	% Participant / Housing Units	HHW Cost / Participant	HHW lbs / Participant	HHW Total lbs	HHW, SQG, & Used Oil From Limited Sites Total lbs
Wahkiakum	2,113	Inc. w/ Cowlitz	Inc. w/ Cowlitz	Inc. w/ Cowlitz	Inc. w/ Cowlitz	Inc. w/ Cowlitz	11,676
Walla Walla	24,163	1,728	7.2%	$61.36	35.1	60,572	91,210
Whatcom	93,154	7,776	8.3%	$43.00	39.5	307,302	481,722
Whitman	20,005	1,015	5.1%	$69.65	30.3	30,777	67,861
Yakima	87,396	14,795	17.0%	$18.80	12.2	181,235	937,282
STATEWIDE	**2,976,797**	**199,585**	**6.7%**	**$45.20**	**66.0**	**13,153,723**	**22,667,260**

* These counties did not report in 2014 and any total pounds shown represents the amount private companies collected from CESQG's in those jurisdictions.
^^ These counties scaled back operations and any HHW pounds reported represent those collected at limited MRW sites and any CESQG amounts reported are from private companies.
^ These counties did not report participation and/or cost information numbers in 2014

Household Hazardous Waste (HHW)

Participants per Housing Unit

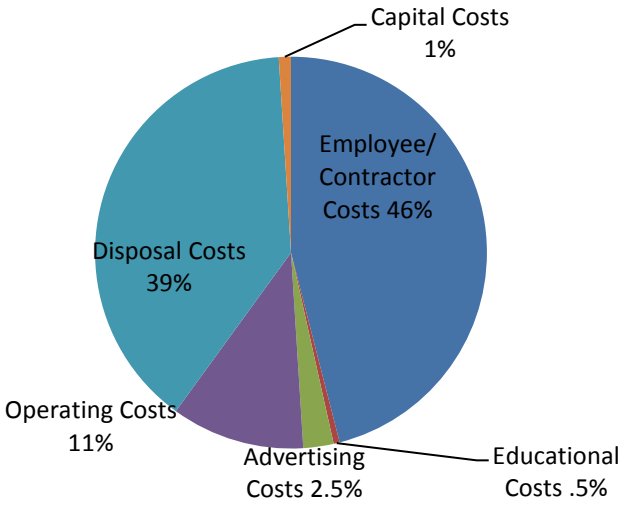
Counties that exhibit ten percent or higher of participants per housing unit provide excellent public education to encourage use of facilities or events, have very convenient locations for their collection facilities, or both.

Cost per Participant and Overall HHW Cost Breakdown

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 programs spent just over $9.0 million in 2014 statewide (does not include CESQG costs). Figure 5.2 shows the overall breakdown of HHW costs reported to Ecology.

Figure 5.2
2014 HHW Cost Breakdown



HHW Pounds per Participant and per Capita

The average pounds collected statewide per participant for HHW was 66.0. Table 5.6 shows the top five counties with the highest collections of HHW in pounds per capita (not participant as shown in Table 5.5) for 2012-2014. Statewide, HHW pounds per capita collected was 1.95 pounds.

Table 5.6
High Collections of HHW (No Used Oil Sites)
Pounds per Capita by County in 2012-14

HHW 2012		
County	**Size**	**Lbs**
Cowlitz	>100K	7.75
Asotin	<50K	6.98
Island	50-100K	6.12
Clark	>100K	6.00
Klickitat	<50K	5.20

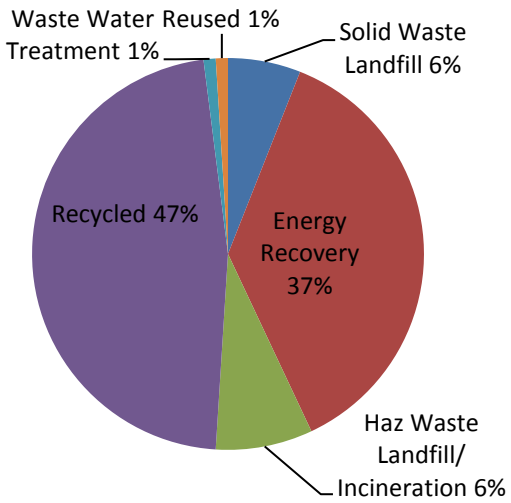
HHW 2013		
County	**Size**	**Lbs**
Asotin	<50K	10.5
Clark	>100K	9.07
Pend Oreille	<50K	8.28
Cowlitz	>100K	7.47
Columbia	<50K	7.04

HHW 2014		
County	**Size**	**Lbs**
Asotin	<50K	11.30
Cowlitz	>100K	8.90
Pend Oreille	<50K	6.12
Clark	>100K	5.93
Lincoln	<50K	5.00

HHW Disposition

Figure 5.3 shows the final disposition of all HHW collected throughout Washington State in 2014.

Figure 5.3
2014 HHW Final Disposition



Conditionally Exempt Small Quantity Generator (CESQG)

Eighteen local government MRW programs collected CESQG wastes in 2014. This number is down from 2009 when there were 22 programs providing collection service to CESQGs. Some programs have decided to discontinue CESQG collection service, while others have had to suspend their CESQG collections temporarily. Okanogan County has provided CESQG collections in the past, but did not report in 2014. Following are the counties that sponsored CESQG waste collections in 2014:

Asotin	Island	Pacific
Chelan	Jefferson	Skagit
Cowlitz	King	Snohomish
Douglas	Kitsap	Thurston
Grant	Kittitas	Whatcom
Grays Harbor	Lewis	Yakima

The top five counties that publicly collected the most CESQG waste per capita in 2014 were:

- Yakima
- Whatcom
- Lewis
- Kitsap
- Island

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 2014 were:

- Franklin
- Clark
- Garfield
- Spokane
- Yakima

Table 5.7
2014 Washington State Public and Private CESQG Collections in Pounds by County

County	Publicly Collected CESGQ Waste	Publicly Collected CESQG Waste /Capita	Privately Collected CESGQ Waste	Total CESQG Waste Collected	Total CESQG Waste Collected/Capita
Adams	0	0	2,039	2,039	.11
Asotin	566	.03	1,178	1,744	.08
Benton	0	0	7,110	7,110	.04
Chelan	13,420	.18	11,446	24,866	.33
Clallam	0	0	1,454	1,454	.02
Clark	0	0	1,109,613	1,109,613	2.51
Columbia	0	0	659	659	.16
Cowlitz	8,222	.08	6,954	15,176	.15
Douglas	775	.02	6,862	7,637	.19
Ferry	0	0	0	0	0
Franklin	0	0	367,648	367,648	4.25
Garfield	0	0	3,679	3,679	1.64
Grant	200	.01	10,247	10,447	.11
Grays Harbor	11,207	.15	5,286	16,493	.23
Island	16,013	.20	1,770	17,783	.22
Jefferson	5,737	.19	653	6,390	.21
King	118,473	.06	1,040,913	1,159,386	.57
Kitsap	77,209	.30	34,555	111,764	.44
Kittitas	3,581	.09	3,245	6,826	.16
Klickitat	0	0	0	0	0
Lewis	32,099	.42	3,237	35,336	.46
Lincoln	0	0	4,231	4,231	.40
Mason	0	0	1,675	1,675	.03
Okanogan	0	0	4,128	4,128	.09
Pacific	3,510	.17	488	3,998	.19
Pend Oreille	0	0	723	723	.05
Pierce	0	0	333,641	333,641	.41
San Juan	0	0	0	0	0
Skagit	17,110	.14	13,929	31,039	.26
Skamania	0	0	225	225	.02
Snohomish	129,054	.17	87,439	216,493	.29
Spokane	0	0	667,306	667,306	1.38
Stevens	0	0	3,240	3,240	.07
Thurston	40,405	.15	24,286	64,691	.25
Wahkiakum	0	0	0	0	0
Walla Walla	0	0	3,438	3,438	.06
Whatcom	103,264	.50	16,387	119,651	.58
Whitman	0	0	8,555	8,555	.18
Yakima	144,273	.58	18,337	162,610	.65
Statewide Totals	**725,118**	**.10**	**3,806,576**	**4,531,694**	**.65**

Table 5.8 shows the top 12 waste categories by amount collected of publicly and privately collected CESQG wastes. The top 12 collected CESQG wastes represents just over 89 percent of all CESQG wastes collected in 2014.

Table 5.8
Twelve Most CESQG Waste Types Collected in 2014

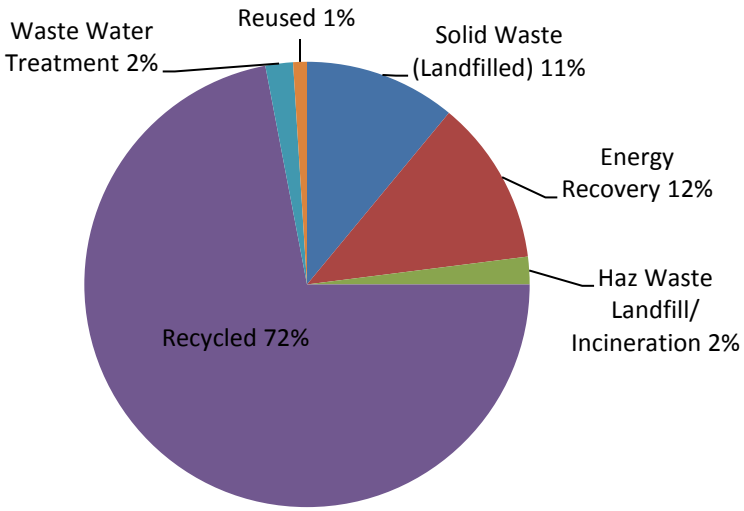
Waste Type	Total Lbs.
Antifreeze	2,239,431
Non-Regulated Solids	414,376
Used Oil – Non-Contaminated	315,986
Other Dangerous Waste	199,239
Paint Related Materials	171,458
Flammable Liquids	165,887
Paint – Oil Base	136,933
Mercury Collections	128,911
Used Oil – Contaminated	128,451
Non-Regulated Liquids	73,868
Paint – Latex	61,887
Pesticides – (Liquids & Solids)	27,640
Total	**4,064,067**

CESQG Disposition

Eight-four percent of all CESQG waste collected in 2014 was either recycled or used for energy recovery. See Figure 5.4 for the complete disposition breakdown of CESQG wastes in 2014. There are a couple differences between final disposition of HHW and CESQG wastes worth noting:

- 37 percent of HHW was sent for energy recovery versus 12 percent of CESQG wastes.
- More CESQG waste is disposed via a solid waste landfill (11%) compared 6% of HHW.

Figure 5.4
2014 CESQG Final Disposition



Collection/Mobile Events

Table 5.9 represents the number of collection/mobile events held statewide from 2012-14.

The amount of waste collected through these types of events was just under 1.8 million pounds in 2014, which is approximately 7.8 percent of all MRW collected in 2014. The Waste Mobile in King County conducted 73 mobile and collection events, including a weekly event at the Auburn Supermall that collected a little more than 1.1 million pounds of MRW in 2014.

Table 5.9
2012-14 Collection/Mobile Event Collection Amounts

Type of Event	Number of Events			Pounds Collected		
	2012	2013	2014	2012	2013	2014
Mobile	80	73	87	1,217,135	1,125,529	1,096,965
Collection	69	76	67	637,664	870,670	670,318
Totals:	**149**	**149**	**154**	**1,854,799**	**1,996,199**	**1,767,283**

Used Oil Sites

In 2014, facilities and collection sites reported collecting a total of 6,605,106 pounds of used oil. Used oil collection peaked statewide (12.4 million pounds) in 2004 and has mostly steadily declined over the years. 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 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. Table 5.10 shows the six counties with the highest collections in pounds per capita by county size for 2012-14.

Table 5.10
Used Oil High Collection Counties - Pounds per Capita by County Size
Collected at Facilities and Used Oil Collection Sites 2012-14

Used Oil Sites - 2012			Used Oil Sites - 2013			Used Oil Sites – 2014		
County	**Size**	**Lbs**	**County**	**Size**	**Lbs**	**County**	**Size**	**Lbs**
Garfield	<50K	8.0	Garfield	<50K	8.4	Stevens	<50K	4.1
Stevens	<50K	4.3	Stevens	<50K	4.1	Skamania	<50K	3.3
Columbia	<50K	3.2	Columbia	<50K	3.6	Cowlitz	>100K	2.5
Asotin	<50K	3.1	Wahkiakum	<50K	3.5	Wahkiakum	<50K	2.5
Cowlitz	50K-100K	2.5	Skamania	<50K	3.4	Asotin	<50K	2.3
Lincoln	<50K	2.4	Lincoln	<50K	3.1	Yakima	>100K	2.0

Statewide Level of Service

The Washington State Office of Financial Management reported that as of 2014, Washington State had an estimated 2,976,797 housing units[2]. MRW Annual Reports revealed there were 199,585 participants who used the services of either an MRW collection event or MRW fixed facility. 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 219,543 participants served in 2014. This number represents 7.4 percent of all households in Washington State. Table 5.11 shows the percent of participants served statewide since 2003.

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

Table 5.11
Percent of Participants Served Statewide

Year	Percent Participants Served	Year	Percent Participants Served
2003	8.9	2009	8.3
2004	8.9	2010	7.9
2005	9.0	2011	7.8
2006	8.6	2012	6.9
2007	9.1	2013	7.4
2008	8.7	2014	7.4