

DEPARTMENT OF  
**ECOLOGY**  
State of Washington

# **Annual Report to the Washington State Legislature on Tires**

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*by*

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# Executive Summary

The Washington State Department of Ecology's (Ecology) Waste 2 Resources Program has issued the Annual Report to the Washington State Legislature on Tires since 2002. Ecology is required by law to provide an annual tire report to the Legislature.

Revised Code of Washington (RCW) 70.95.545 requires Ecology to report the increase or reduction in tire recycling and reuse rates in the state. This report tracks changes in those rates from 2002-10. These data provide overall and annual snapshots of tire recycling and reuse in Washington. Trends in tire reuse, recycling, and landfiling have all decreased in the past year compared to data collected in 2009. Use of tires for fuels increased for the second year in a row, likely due to demand from overseas markets.

Ecology conducted waste tire pile cleanup efforts from 2007-10. A summary of those efforts is included in this report in Appendix A.

# Tire Recycling and Reuse - 2010

Each year the Washington State Department of Ecology (Ecology) collects data on tire recycling and reuse (RCW 70.95.545). This annual report summarizes the increase or reduction in the rates of recycling and reuse since 2002. The Legislature received Ecology's first [Scrap Tire Report](#) in 2002.

*"The department of ecology, in conjunction with the appropriate private sector stakeholders, shall track and report annually to the legislature the total increase or reduction of tire recycling or reuse rates in the state for each calendar year and for the cumulative calendar years from June 13, 2002." [RCW 70.95.545](#)*

Recycling, reuse, disposal and generation data in this section come from various sources:

- Annual disposal reports from landfills, transfer stations, drop boxes, tire haulers, tire businesses and tire storage sites.
- Reports and survey responses from recycling facilities.
- Tire cleanup program tracking data.
- Vehicle registration data used to estimate waste tire generation.

Table 1 provides recycling, reuse, disposal and generation data from 2002-10. The totals include Ecology Tire Pile Cleanup Program efforts from May 2007 to September 2010 (see Appendix A for more details).

**Table 1.1  
Summary of Annual Tire Recycling and Reuse**

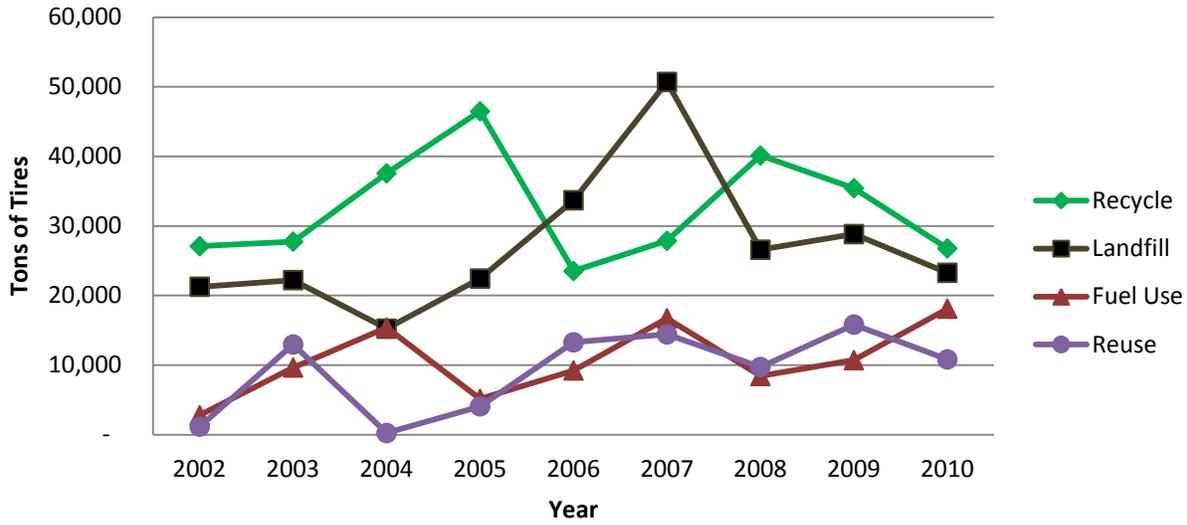
Calendar Year	Landfill Disposal	Recycled Tires	Reused Tires*	Tires Used for Fuel	Total Reported
<b>2002</b>	21,273	27,102	1,170	2,817	<b>52,362</b>
<b>2003</b>	22,226	27,753	12,976	9,664	<b>72,619</b>
<b>2004</b>	15,246	37,568	251	15,400	<b>68,465</b>
<b>2005</b>	22,446	46,483	4,089	5,167	<b>78,185</b>
<b>2006</b>	33,697	23,532	13,281	9,250	<b>79,760</b>
<b>2007</b>	50,703	27,869	14,424	16,735	<b>109,731</b>
<b>2008</b>	26,590	40,124	9,741	8,440	<b>84,895</b>
<b>2009</b>	28,834	35,439	15,836	10,725	<b>90,895</b>
<b>2010</b>	23,275	26,775	10,834	18,121	<b>79,006</b>

\* Reused tires includes retreaded and baled tires

The following waste tire trends are shown in Figure 1:

- Decrease in three of the four categories in 2010 compared to 2009: 24 percent decrease in tire recycling, 19 percent decrease in tire landfilling, and a 32 percent decrease in tire reuse.
- Continued increase in the use of tires for fuel: 69 percent increase over 2009.

**Figure 1  
Tire Use Trends**



## Where Do The Tires Go?

The categories listed in Table 1.1 and shown in Figure 1 are explained below.

### Recycled Tires

Tires can be recycled by grinding up the rubber and remolding it for other purposes. Some uses of ground rubber include groundcover under playground equipment, running track material, and components of sports and playing fields. Tires can also be cut, punched or stamped into various rubber products, including floor mats, belts, gaskets, shoe soles, dock bumpers, seals, muffler hangers, shims and washers.

The ground rubber product market has shown the greatest growth in recycled tire materials. However, the conversion to synthetic field turfs for football, soccer and other playing surfaces will be limited by the finite number of athletic fields. The cut, punched and stamped rubber products market is limited to tires that do not have steel belts, known as “bias-ply” tires. There is a limited supply of bias-ply tires available for this market.

### Landfill Disposal

Tires are a problem in landfills because they are difficult to compact and do not decompose easily. Tires take up valuable landfill space. Over time, whole tires can float to the top, working their way up through the waste and soil. Tires disposed of in landfills are usually shredded or at least cut in half before disposal.

## **Fuel Use**

Because of their high heating value, waste tires make good fuel. Tire-derived fuel (TDF) can provide up to 15,000 British thermal units (BTUs) per pound, which is higher than coal, oil or wood. Burning waste tires is not recycling under the state's definition, but we consider it a higher use than landfilling. Tires serve as fuel either shredded or whole, depending on the type of conveyor or combustion device.

In Washington, only one cement kiln currently uses whole tires as fuel. The high BTUs provided by tires allow a cement plant to reduce use of other fuel sources, which results in cost savings. Cement kilns operate at very high temperatures (around 2,600°F) and have long residence times, resulting in complete combustion of the tires. The metal in the steel belted tires combines with the cement product. Compared to coal, use of tires in cement kilns has been reported to lower some nitrogen oxide emissions.

## **Reused Tires**

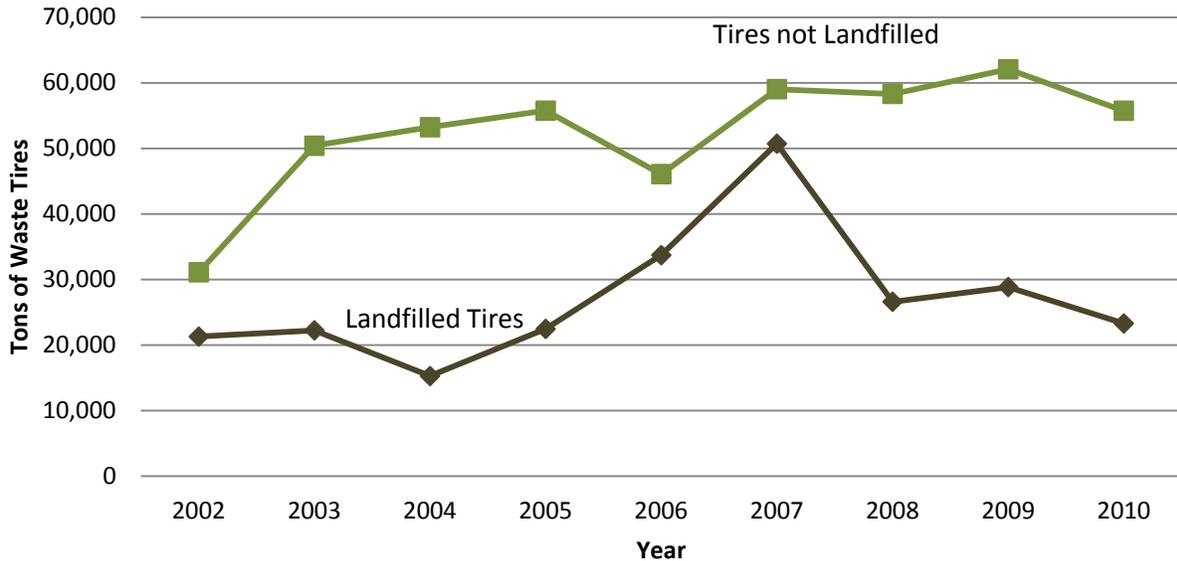
Retreaded tires contain up to 75 percent recycled content. Manufacturing one new truck tire takes 22 gallons of oil. Most of the oil is found in the casing. The retreading process places a new tread on the old tire casing. As a result, it takes only 7 gallons of oil to produce a retread.

Reused tires include the use of tire bales in construction projects. A tire bale contains about 100 passenger tires compressed into a block wrapped with galvanized steel bands. Tire bales can take the place of other fill materials at some construction sites. Tire bales can be used in road base, noise reduction walls, erosion control, firing ranges and racetrack walls.

## **Overall Waste Tire Trends**

Annual reports on collection of tires from landfills and recyclers from 2002-10 are summarized in Figure 2. Reports of tire landfilling appear to have changed little from 2002 to 2010. The increase in landfilled tires in 2007 can be attributed to the Ecology funded waste tire pile removal efforts (see more details in Appendix A). It appears the overall trend for tires in landfills has steadily declined in the past decade.

**Figure 2  
Waste Tire Trends**



## Generation of Waste Tires

Ecology determines the annual generation of used tires on the number and types of vehicles licensed in the state by using data from the Washington Department of Licensing (in Report 07 Motor Vehicle Transactions by Class). The national average is one used tire a year from each passenger vehicle. The national annual tire average for other vehicles such as trucks, trailers or motorcycles is less than one, ranging from 0.25 to 0.4 used tires a year. We applied these percentages to the number of vehicle types registered to estimate the total number of used tires generated.

The 6.9 million vehicles licensed in Washington in 2010 generated more than 5 million used tires. Based on average vehicle tire weights, this equals 86,817 tons of waste tires generated in 2010, which is not a significant change from the prior year (less than a one percent decrease). The number of waste tires reported to Ecology is lower than the amount generated. The current recession may be impacting the rate of purchase of new tires and creation of waste tires. People are likely keeping their tires longer than they might have without this recession.

**Table 1.2  
Waste Tires: Reported Collection and Calculated Generation**

<b>Calendar Year</b>	<b>Reported Collection</b>	<b>Calculated Generation</b>	<b><i>Difference</i></b>
2002	52,362	80,988	28,626
2003	72,619	83,886	11,267
2004	68,465	80,766	12,301
2005	78,185	83,892	5,707
2006	79,760	85,354	5,594
2007	109,731	86,978	-22,753
2008	84,895	87,383	2,488
2009	90,895	87,050	-3,845
2010	79,006	86,817	7,811

\*\* Based on vehicle registration data

### **Waste Tire Website**

Ecology maintains a Waste Tire Program website located at (<http://www.ecy.wa.gov/programs/swfa/tires/index.html>) providing information on:

- Overall program summary
- Tire cleanup program efforts
- Waste tire fees and licenses
- Tire recycling and reuse
- Tire related publications
- Other tire resources and website links
- Frequently asked questions

## Appendix A - Waste Tire Pile Cleanups 2007-10

In 2005, the Washington State Legislature passed Substitute House Bill (SHB) 2085, creating the Waste Tire Removal Account (08R) to fund cleanup of unauthorized and unlicensed tire piles. Funds for this account come from a \$1 fee charged on each new replacement tire sold in Washington. The 2009 Legislature removed the sunset on this fee and allocated a biennial budget of \$1 million to Ecology (Senate Bill 5796). The balance of the account transfers to the Washington State Department of Transportation's Motor Vehicle Account on September 1 of odd numbered years.

The Waste Tire Removal Account funded seven cleanup contracts starting in May 2007 through September 2010. These contract efforts removed more than 5 million tires from 175 waste tire piles in 30 counties across the state (1 ton of tires is about 100 passenger tires). These efforts removed nearly 5.5 million tires from piles to reuse or disposal. Common recycling and reuse of waste tire materials includes crumb rubber, stamped rubber bumpers, tire rings, fuel for cement kilns and scrap steel (wheel rims). These tire pile removals include all the remaining unauthorized tire piles identified in the 2005 report to the Legislature (Ecology [Publication 507043](#)).

Table A.1 provides an annual summary for cleanup activities listed completed from May 2007 to September 2010. The relatively high cost per site experienced in 2007 is due to several very large cleanups conducted at the start of the program. The largest tire pile cleanup was at the Goldendale tire pile which contained more than two million tires. More than 200,000 tires were removed from each site at the Pumphouse Road, Petty and Napavine cleanups. Excluding those four large cleanup efforts, tire pile size across the state averaged 15,600 tires with a median size of 9,000 tires.

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

Year	Sites	Tons	Recycled or Reused	Total Cost	Average Cost/site	Average Cost/ton
2007	26	32,671	55%	\$4,300,079	\$165,388	\$132
2008	53	8,324	86%	\$1,933,954	\$ 36,490	\$232
2009	82	11,607	92%	\$2,615,801	\$ 31,900	\$225
2010	14	2,230	80%	\$ 598,810	\$ 42,774	\$269
<b>Total</b>	<b>175</b>	<b>54,832</b>	<b>&gt; 80%</b>	<b>\$9,448,664</b>	<b>\$ 53,992</b>	<b>\$172</b>

Table A.2 summarizes the cleanup efforts by county including the removal cost, total tons removed, and amount of tires recycled. Map A shows the approximate locations of these tire cleanup efforts, including one dot for the 14 sites located in and around Goldendale (Klickitat County). The cost of tire pile cleanup averaged \$172 per ton (approximately \$1.72 per tire) across all 175 pile removals.

**Table A.2  
Tire Pile Cleanups 2007-10**

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

**Map A.1  
Completed Tire Pile Cleanups in Washington 2007-10**

