

Environment and Natural Resources

The preservation and conservation of open space, food and forest production land, and areas of scenic beauty are important to the residents of Thurston County. As Thurston County's population grows, increasing demands are placed on the area's natural resources. This chapter provides information on a variety of areas related to our region's environmental health and sustainability, examining trends that may have long-term impacts on the region.

Agricultural and Forest Lands

Although Thurston County is not commonly noted as a county with a strong agricultural base, approximately 17 percent of the County's land use is given to agricultural activities. In addition to providing economic diversity and food production, keeping land in agricultural use promotes land conservation, which is particularly important since much of the agricultural lands lie in close proximity to urban areas. Policies to promote a healthy agricultural economy include zoning, designation of urban growth areas, and protecting agricultural land owners from high tax rates.

Forest lands are important to the community for the economic, environmental, and quality of life benefits they provide. The management of forest lands in timber production provides a variety of environmental benefits including reduction of soil erosion, protection of wildlife habitat, improvement of water quality and air quality, mitigation of the effects of storm and flood damage, as well as providing recreational and scenic opportunities.

It is estimated that between 1985 and 2000, almost 56,000 acres of land were in the forest harvest cycle, for an average annual rate of approximately 4,000 acres per year. Forest lands have been harvested at a rate of approximately 1.3 percent annually, which translates to 20 percent of the County's forest lands being harvested between 1985 and 2000. The rate of harvest is significantly higher in the rural County where most of the commercial forest lands are found.

The County has implemented several strategies for forest land conservation, including long-term zoning, designation of urban growth areas, close monitoring of forest practice activity—especially in the designated urban areas—and protection for forest land owners against high tax rates.

Table VIII-1 provides land cover data for Thurston County by jurisdiction.

Additional information on Thurston County's agriculture can be found in **Tables V-22** and **V-23** in the Economics chapter.

Table VIII-2 provides an estimate of forest harvest activity in Thurston County between 1985 and 2000.

Open Space Tax Program

Table VIII-3 displays acres of land in Thurston County that are conserved under tax protection programs.

Thurston County administers a voluntary tax program for property owners of significant open space and forest resources. The Open Space Tax Program provides tax breaks to property owners who forego developing their land in favor of preserving wildlife habitat, recreation sites, forest land, agriculture, and other natural resources for the benefit of the community. The program was established in 1970 by the Washington State Open Space Tax Act in order to encourage eligible property owners to preserve natural resources for the benefit of the public. Owners of agricultural lands, timberlands, natural areas, and other types of open space can enroll their properties in the tax program. Properties enrolled in the Open Space Tax Program are valued based on their current use, rather than their “highest and best” use (e.g., residential or commercial development), resulting in reduced property taxes for the owner.

Urbanization

Table VIII-4 shows urbanization of various land covers by watershed in Thurston County between 1985 and 2000.

Trends in urbanization over time provide insight into changes in the physical environment of Thurston County. The urban landscape is composed of a variety of physical features, including distinctly urban features such as roads and buildings, as well as trees, lawns, and other non-urban land cover. Measuring past changes in land cover of built or urban features in Thurston County can provide insight into conditions in the future. Large-scale change detectable from satellite imagery indicates that approximately 32,000 acres of land were converted from intact forest stands, agricultural lands, or large expanses of shrub vegetation to urban landscapes between 1985 and 2000 in Thurston County. Due to differences in density of development in the urban and rural environment, significantly more land is consumed for rural development than urban. Watersheds experiencing the greatest percent of urbanization between 1985 and 2000 were Henderson Inlet with 12 percent and Black River with 10 percent.

In general, watersheds or basins that have an urban or built land cover of less than 10 percent are generally considered protected in terms of water quality. Most of the rural basins in Thurston County fall into this category. Urban land cover increased by over 1,700 acres in the Budd/Deschutes Watershed between 1985 and 2000, an increase of over 24 percent. Other watersheds that have experienced rapid changes in urban land cover are the Nisqually River Watershed (1,200 acres; 40 percent) and Henderson Inlet (1,135 acres; 31 percent.)

Urbanization can be directly linked to impervious surfaces. Parking lots, roof tops, and even compacted lawns all lead to increased water runoff, and less water returning to our groundwater systems. Recent scientific evidence has found a correlation between forest cover, urban cover (impervious area), and stream conditions. TRPC has worked with the Stormwater Utilities of Lacey, Olympia, Tumwater and Thurston County to develop forecasts of impervious area by watershed for the year 2030. They have done this by linking forecasts of housing and commercial and industrial building space to land cover. While urban or built land cover data represent only one factor that influences stream health, it can be used as a prioritizing tool in developing basin plans.

Thurston Conservation District

Conservation Districts exist in nearly every county throughout the United States, and are non-regulatory legal subdivisions of state government that administer programs to conserve natural resources. Thurston Conservation District was created by Thurston County landowners in 1948. Its mission is “to conserve and sustain the beneficial use and protection of our natural resources through rural and urban partnerships fostering volunteerism, cooperation, education, leadership and technical and financial assistance.”

Thurston Conservation District works to assist both rural and urban landowners in putting conservation practices on the ground. District projects are implemented to improve or protect soil resources, water and air quality, native plant communities, and fish and wildlife habitat - particularly salmon and shellfish production areas - as well as improving farm productivity. Some examples of the areas where assistance is provided include pasture and manure management, restoration of streams and wetlands, maintenance and improvement of wildlife habitat and forest lands, education and information programs, and developing conservation plans tailored to address natural resource concerns on a particular property while meeting the management objectives of the landowner.

The District is involved in both large and small conservation projects. Projects may involve an individual landowner or a group of several landowners, as well as cooperative projects with other agencies. The District’s services are free of charge to Thurston County residents, and financial assistance may be available to implement conservation projects.

Table VIII-5 shows the change in urban land cover in Thurston County from 1985 to 2000. **Table VIII-6** shows estimates of total impervious area for the years 2000 and 2030 by watershed, while **Table VIII-7** shows estimates of effective impervious area.

For a complete report about urbanization, forest harvest and estimates of impervious area in Thurston County, visit the Thurston Regional Planning Council’s website at www.trpc.org. (www.trpc.org/library/estimates+and+forecasts/development/index.htm)

For more information on the Thurston Conservation District, visit their website at www.thurstoncd.com.

Parks and Public Lands

Map 18 shows parks and trails in Thurston County; **Table VIII-8** lists all municipal parks, including their acreage and facilities; **Table VIII-9** addresses county, state, and federal parks; and **Figure VIII-1** compares per capita park acreage by jurisdiction.

As grows, the demand for access to public parks and open space increases, while there is also additional pressure to develop the remaining available land. Therefore, parks and natural resource departments at all governmental levels play an increasingly important role in acquiring parcels of land that will be used for public parks and open space preserves. City and county parks and preserves offer not only recreational opportunities for residents and visitors to Thurston County, but also provide beneficial environmental services such as the protection of sensitive areas, enhancement of air and water quality, provision of flood control, and conservation of wildlife habitat.

The seven cities and towns in Thurston County provide approximately 1,940 acres of park, recreation, and open space. Facilities include memorials, playfields, natural areas, and campgrounds. Thurston County manages another 2,740 acres including the Chehalis Western trail, a paved walking and bike path.

To locate Washington Fish and Wildlife recreation areas visit their web site at wdfw.wa.gov.

Thurston County residents have access to a number of state- and federally-managed public lands. These lands offer a variety of recreational activities such as boating and fishing, biking and camping, hiking, and wildlife viewing. Within Thurston County there are over 100,000 acres of state and federal lands including 3,000 acres of wildlife habitat at the Nisqually National Wildlife Refuge, 840 acres at Millersylvania State Park, and approximately 92,000 acres in Capitol Forest. In addition to the numerous open space areas, Thurston County has a number of historical sites, including the State Capital Museum and the Bigelow House.

Air Quality

Table VIII-10 shows actual emissions for criteria pollutants of point sources in ORCAA's region.

Air is an essential part of life. Every day you breathe about 35 pounds of air. High levels of air pollutants can impact peoples' outdoor activities and those with heart or lung disease, asthma, or challenged immune systems. Air pollutants may also impact wildlife and habitat.

Table VIII-11 & Figure VIII-2 depict air pollution sources in Washington.

In order to preserve, protect, and enhance the air quality for current and future generations, the Washington Clean Air Act was passed in 1967. As a result, the Olympic Regional Clean Air Agency (ORCAA) (formerly the Olympic Air Pollution Control Authority) was established as a local government agency having regulatory and

enforcement authority in and for Clallam, Grays Harbor, Jefferson, Mason, Pacific, and Thurston Counties. ORCAA is responsible for enforcing federal, state, and local air pollution standards and governing air pollutant emissions from new and existing sources.

In Washington, almost 60 percent of air pollution comes from highway vehicles. Individuals do have an impact on the quality of air we all breathe. Carpooling, biking, walking, or taking the bus helps reduce auto emissions, while reduced indoor and outdoor burning lessens carbon dioxide and particulate matter levels.

PM10 Maintenance Area

In the Thurston region, air quality is generally very good, and has improved measurably over the past two decades. In the 1980s, the region's air quality suffered from high levels of PM10 (particulate matter less than 10 microns in size). PM10 is a public health concern because small particles can become trapped in the lungs, reducing their ability to absorb oxygen.

The national standard for PM10 averaged over a 24 hour period is 150 micrograms, but in 1985 the region's maximum readings hovered in the range of 250 micrograms. The major source of PM10 emissions in the Thurston region at that time was residential woodstove combustion.

Areas that experience persistent air quality problems are designated by the federal government as non-attainment areas. Each non-attainment area is declared for a specific pollutant within a specific boundary. The federal Clean Air Act requires additional air pollution controls in such areas. In the late 1980s, the urbanized part of the Thurston region was designated as a non-attainment area for PM10.

In response, ORCAA launched an aggressive campaign to curb PM10 through the use of more efficient woodstoves and restrictions on outdoor burning. As a result, the region experienced a steady decrease in PM10, falling below the national standard since 1990 and well below that standard today. In 2000, the PM10 non-attainment area was re-designated as a maintenance area and allocated a PM10 budget, which is a ceiling for acceptable levels.

The Thurston region is an attainment area for carbon monoxide and ozone.

Table VIII-12 displays air quality monitoring data for Thurston County.

For more information on regional air quality see ORCAA's web site at www.orcaa.org or the Washington State Department of Ecology at www.ecy.wa.gov.

Water Quality

Puget Sound Water Quality

For more information on the Puget Sound Partnership see their web site at www.psp.wa.gov.

The quality of the water in Puget Sound influences the quality of life in Thurston County. However, over time, human activity within the basin has degraded the water quality of Puget Sound. Excess run-off from developed areas flows into the Sound containing contaminants that are harmful to shellfish and marine life. Structured surfaces along the shoreline, such as bulkheads, have replaced valuable marine life habitat, and excessive affluent discharge into the Sound has raised fecal coliform levels which can be unhealthy for swimmers and contribute to the closure of commercial shellfish beds. The Puget Sound Partnership is a state agency established in 2007 to lead efforts to protect and restore Puget Sound.

Table VIII-13 lists the water quality index of concern for south Puget Sound Inlets.

The Washington State Department of Ecology generates a Water Quality Concern Index for inlets of the Puget Sound. Of the five inlets in Thurston County, Budd Inlet has been given a very high concern level, Nisqually Reach a high concern level, and Totten, Henderson and Eld Inlets have a low concern level.

Groundwater

Groundwater is an important natural resource as nearly the entire County relies on it for residential, agricultural, and industrial needs. There are more than 1,200 public water supplies in Thurston County that tap groundwater sources, and over 8,000 private wells. These serve approximately 99 percent of the drinking supplies for County residents. Not only is groundwater important for residential, agricultural, and business uses, it is also the primary source of stream flow during the dry summer months, which is essential to maintaining the health of the County's ecosystems, fisheries, and recreational opportunities.

One factor affecting groundwater quality and quantity is development and associated stormwater runoff. When stormwater is channeled directly into a surface water body, less water goes into the ground. Even where stormwater is recharged to the ground through a pond or trench, it can carry pollutants in amounts that over time may contaminate groundwater. Other influences associated with development, such as septic system releases, lawn and garden chemical applications, and pollutants associated with vehicle use, can also cause groundwater pollution. Even if recharge rates exceed

water use, water in adequate quantity may not be available in the areas where people want to live. Water supply in some places does not meet demand. For instance, in the Black Hills and Bald Hills regions, bedrock is found just below ground level.

In order to protect groundwater supplies, local jurisdictions have developed joint wellhead protection policies. These programs are designed to protect recharge areas near municipal water supplies such as wells and springs. By identifying and controlling pollution sources, the jurisdictions will develop contingency plans needed to respond swiftly in case of unexpected loss of a water supply.

For more information on groundwater monitoring, visit Thurston County's web site at: www.co.thurston.wa.us/monitoring.

Water Conservation Measures

Conservation has proven to be a successful way to extend water supplies and wastewater treatment capacity in Thurston County. The Cities of Lacey, Olympia, and Tumwater, with funding from the LOTT Alliance, have participated in several indoor water conservation projects since 1997. These water conservation projects have resulted in over 600,000 gallons per day reduction in wastewater flow (and corresponding water use). This equals over 200 million gallons of water saved annually, and is equivalent to approximately 8 percent per capita per day wastewater flow reduction since the programs began. In 2009, LOTT offered rebates for the purchase of water-efficient washing machines, free showerheads and faucet aerators, and free high-efficiency toilets to eligible sewer customers.

Wastewater Management Systems

LOTT Alliance

The LOTT Alliance helps preserve and protect public health, the environment, and water resources by providing wastewater management and reclaimed water production services for the urbanized area of north Thurston County. The acronym "LOTT" stands for its four government partners Lacey, Olympia, Tumwater, and Thurston County.

LOTT treatment volume in 2008 averaged 10.19 million gallons per day (mgd), which was down from 11.07 mgd in 2007. The peak month in 2008 was January, averaging 13.88 mgd. The peak day was November 12, 2008 when the volume reached 26.36 mgd.

LOTT was formed in 1976 through an intergovernmental agreement between the three cities and the County. The agreement provided for cooperative use and development of the Olympia wastewater treatment plant, established major sewer lines (interceptors) servicing multiple jurisdictions, and initiated a major 1983 upgrade of the Budd Inlet Treatment Plant to provide secondary treatment of wastewater. The

Wastewater Treatment Processes:

Primary treatment processes remove floating and settled solids. The resulting fluids are then disinfected and discharged.

Secondary treatment introduces bacteria that dissolve the organic parts of the waste before the disinfection process.

Tertiary treatment extends the process further by removing nutrients such as nitrogen and phosphorus, and a higher percentage of suspended solids.

City of Olympia continued to legally own, operate, and maintain the treatment plant and other LOTT facilities on behalf of the four partners. Another major upgrade occurred in 1994 with the addition of nitrogen removal and ultraviolet disinfection, enhancing LOTT's treatment quality to advanced secondary standards. Today, the LOTT partners serve about 90,000 people over a 23,000-acre area. In addition to the central wastewater treatment plant, pump stations and major interceptor sewer lines, LOTT is also responsible for flow management, longrange planning, and a new service – production of reclaimed water.

The move to reclaimed water production was the result of a four-year long-range planning process that began in fall 1995 and resulted in a new Wastewater Resource Management Plan (WRMP). Implementation began in January 2000. The plan set the stage for new approaches to wastewater management in the Lacey-Olympia-Tumwater area through 2020 and beyond. To implement the plan, LOTT was reorganized from the paperwork partnership to an independent non-profit organization, owned by the four governments. LOTT was incorporated as the LOTT Wastewater Alliance in 2000, and became a stand-alone entity as of July 2001. LOTT continued contracting with the City of Olympia for operation and maintenance of the Budd Inlet Plant and other facilities through 2004. At the beginning of 2005, the contract was discontinued and LOTT assumed full operational responsibility. Reflecting its role as a producer of reclaimed water, LOTT took the further step of eliminating “Wastewater” from its name to become the LOTT Alliance, effective January 2005. A new logo includes a tag line summarizing the expanded mission: “Cleaning and restoring water for our community.”

As the focal point of its long-range plan, LOTT now treats a portion of its wastewater to tertiary standards for Class A Reclaimed Water, using two different treatment technologies at two locations. At the Budd Inlet Reclaimed Water Plant, housed at the Budd Inlet Treatment Plant, a continuously back-flushing sand filter is used to produce Class A Reclaimed Water, the highest quality of reclaimed water as designated by the State Departments of Health and Ecology. Class A Reclaimed Water is clean enough for public contact and most uses except drinking. Up to one million gallons per day is filtered to Class A Reclaimed Water standards at the Budd Inlet facility. The reclaimed water is currently being used for irrigation in the Heritage Park, Percival Landing, and Port of Olympia areas. The City of Olympia serves as the water utility to distribute that reclaimed water to users.

To meet future expanded wastewater treatment capacity needs, the Wastewater Resource Management Plan focuses on creating new capacity in small increments, at the Budd Inlet Reclaimed Water Plant and at satellite treatment plants that produce Class A Reclaimed Water. Each new increment of capacity will be built “just in time” to meet new capacity needs — based on population and employment projections, remaining capacity in existing facilities, and other constantly measured factors. Construction of the first satellite, the Hawks Prairie Reclaimed Water Satellite, was completed in 2006. The Martin Way Reclaimed Water Plant uses a membrane bioreactor technology to treat up to two million gallons per day, and is expandable to five mgd. The Cities of Lacey and Olympia are expected to begin distributing reclaimed water from the Hawks Prairie Satellite to users in 2010. Currently, reclaimed water is piped to the 40-acre Hawks Prairie Reclaimed Water Ponds, where it circulates through a series of constructed wetland ponds in an attractive park-like setting, before flowing into groundwater recharge basins.

For more information on the LOTT Alliance, visit their website at www.lottonline.org.

The heart of the wastewater treatment system, however, remains the central Budd Inlet Treatment Plant in downtown Olympia. To gain maximum benefits from the existing Budd Inlet Treatment Plant, LOTT sought permission from the State Department of Ecology to increase the amount of its advanced secondary treated water that can be discharged into Budd Inlet in the wintertime. This helps LOTT manage peak winter flow conditions and also provides a “reserve capacity” buffer while each new increment of reclaimed water production capacity is built. A new interim discharge permit was issued by Ecology in fall 2005. Although the new permit included the requested increase in wintertime limits, up to 28 million gallons per day, it also included a phased reduction in summertime discharges, from 15 mgd to about 12.5. A number of major projects are planned for the Budd Inlet Treatment Plant in the next few years, including significant process control improvements, remodeling of the Water Quality Laboratory, and the addition of a new Administrative and Education Center.

The new Education Center, scheduled for completion in the spring of 2010, opens a new chapter in the development of the LOTT Alliance. This Center provides a “public storefront” for the utility, inviting the public to learn about the essential services that LOTT provides to our communities. Interactive activities and displays for all ages will address the importance of clean water, how LOTT uses science and technology to clean used water, and what the public can do to help

conserve this precious resource. The Education Center will expand LOTT's educational reach, providing a more complete picture of how wastewater treatment fits into the water cycle and the overall health of our environment.

Yelm's Class "A" Water Reclamation Facility

For its size, the City of Yelm has been a pioneer in the treatment and collection of its wastewater since 1994 when Yelm was one of the first cities in the south county to implement a septic tank effluence pump station collection system (STEP). Subsequently, in 1999 the City expanded this system into one of the first Class "A" Reclaimed Water Facilities in the State of Washington. The plant expansion increased the then current plant capacity of 300,000 gallons per day to 1,000,000 gallons per day, allowing for future connections within the present city limits and short-term urban growth boundary. The STEP collection tanks still serve as the primary phase of treatment prior to delivery of the effluent to the water reclamation facility.

The reclaimed water project also included the construction of Cochrane Memorial Park, a beautiful manmade constructed reclaimed water wetland park, featuring walking trails, picnic areas, a trout pond, waterfowl habitat and groundwater recharge facility.

In 2002, Yelm received Ecology's Environmental Excellence Award for successfully implementing Class "A" reclaimed water into its community. "Purple pipe" distributes Yelm's reclaimed water to schools, churches, city park facilities, city streetscapes, Yelm Prairie Line Trail, and Thurston County Rails to Trails trailhead for irrigation purposes. The reclaimed water is also used for dust control, vehicle washdown, treatment plant equipment process water, as well as to irrigate the City's tree nursery and greenhouse.

This project is unique in that it allows the City of Yelm to reclaim 100 percent of its wastewater with upland use and streamflow augmentation. An additional regional benefit of Yelm's water reclamation facility is a cleaner Nisqually River and Puget Sound salmon habitat. More importantly, the use of reclaimed water is an example of environmental stewardship and conservation by lessening the dependence upon regular potable groundwater, further conserving this precious natural resource.

Grand Mound Wastewater Facility

The Grand Mound Wastewater Facility has been serving the Grand Mound area since 1998. The Grand Mound Wastewater Facility is now operating with an average wastewater flow of 130,000 gallons a day. The bulk of the wastewater comes from Great Wolf Lodge, a 200 plus room resort, water park, and conference center, that opened in February 2008. Other contributors to the Grand Mound Wastewater Facility include the Maple Lane Juvenile Detention Center, WA State Department of Transportation I-5 North & South rest areas, local businesses, and residential areas. The plant type is an activated sludge oxidation ditch system with a UV disinfection system. The plant's receiving water is the Chehalis River. The facility currently runs at about 35 percent of capacity.

For more details about specific facilities and programs throughout the County, visit the Department of Water and Waste Management, Solid Waste Division at www.co.thurston.wa.us/wwm.

Tenino Wastewater Treatment Plant

Tenino has historically utilized septic disposal for all wastewater treatment. The City of Tenino adopted a General Sewer Plan and a Sewer Facility Plan in 2007. Funding for Tenino's wastewater treatment plant was provided by state and federal sources. The city broke ground on construction of the conveyance system in April of 2008. The system is expected to go online in November 2009.

Solid Waste Management

Thurston County Solid Waste is responsible for receiving, processing, and disposing of all County solid waste. The Comprehensive Solid Waste Management Plan (SWMP) guides this effort. The plan emphasizes the importance of diversion strategies for wastes, and sets goals for recycling and recovery. The Board of County Commissioners adopted the current Plan in January of 2002. It will be revised in 2009-10 to reflect changes in waste management practices that have occurred since that time.

Disposal

Until 2000, all County solid waste was buried at the Hawks Prairie Landfill. A site of roughly 140 acres, it was used as a dumping and burning site since the 1940s, and converted to a landfill in 1972. The active 20-acre, lined landfill was capped and closed in April, 2000.

In May, 2000, a state of the art transfer station was opened at the site that can accommodate 600 tons of waste per day. The waste is loaded

Table VIII-14 displays Thurston County recycling and solid waste data.

into trucks, hauled to Centralia, placed on rail cars, and transported by train to the Roosevelt Regional Landfill in Klickitat County (eastern Washington).

A portion of the original site is also home to the Recycle Center, Compost Center, Closed Loop Park (a park demonstrating earth-friendly gardening techniques), and HazoHouse, as well as new scales to improve traffic flow at the site.

Due to these changes in the management of waste in the County, the site is now called the Waste and Recovery Center.

Waste Reduction/Recycling

Thurston County Solid Waste Education and Outreach staff provides programs and outreach materials to assist the public. A new database at www.WhereDoITakeMy.org compiles all the local reuse and recycling opportunities by commodity. School presentations and assistance, transfer station tours, brown-bag workshops, business assist visits, composting demonstrations, and more are available free of charge by calling 360-754-2896 or visiting www.co.thurston.wa.us/wwm.

To reduce the amount of generated waste, the 1993 SWMP established reduction goals of 40 percent by the year 1995, and 60 percent by the year 2000. These ambitious goals were influenced in part by the State goal of a 50 percent recycling rate by the year 2000. Neither the County nor the State met those goals. Since 1993, county and state recycling rates have fluctuated due to waste reduction efforts and the economy. The amount of trash disposed of dropped dramatically in 2008, primarily due to the state of the economy.

The 2001 SWMP emphasizes waste reduction and recycling, and also focuses on individual waste generation where people can easily recognize their impact. This focus illustrates the importance of waste reduction, not just recycling. The national trend towards increased disposal is a national problem, and Thurston County is working with other jurisdictions to understand and mitigate this trend.

The County's recycling program includes curbside collection for single-family and multifamily residences, four drop-off recycling stations distributed around the County, and a staffed Recycle Center at the Waste and Recovery Center. Additional recycling efforts include collection at community events and Community Recycle Days, a twice-yearly opportunity to recycle items not accepted through curbside or other drop-off programs.

In 2007, a new single-stream curbside recycling program replaced the 3-bin system in areas of the County serviced by LeMay. The system is more convenient and easy to use for residents, and has increased recycling by 38 percent to date. All residents that have LeMay curbside trash service were provided with a recycling cart. Residents in these areas may also subscribe to "recycle only" service. Olympia operates as its own hauler and has had single stream recycling for several years.

In 2007, LeMay Enterprises rolled out a new Certified Green recycling program for businesses and schools. The bundled program for one low rate, which includes food waste, has made recycling very cost effective and saves most businesses a significant amount of money compared to just trash service. The program is available countywide, including Olympia. The city of Olympia also offers food waste recycling to businesses.

In 2008 both LeMay and the City of Olympia residential customers began placing food and compostable paper in their yard waste bins (now called organics bins). These two items currently make up 19 percent of the residential waste stream going to landfill, so the new program will make a significant impact on the County's diversion rate. The amount of organics now recycled has increased by 27 percent compared to the previous year.

Organics

A key element of the Solid Waste program is the diversion of organic waste. Yard and garden trimmings can be managed at home through backyard composting, collected at the curb as mentioned above, or self-hauled to the compost center at the Waste and Recovery Center or the new Silver Springs composting facility in Rainier. Thurston County Solid Waste subsidizes the cost of home composting bins, making them affordable for residents. These can be purchased through the local Master Composters organization.

Hazardous Waste

County education programs continue to encourage residents to choose safer alternatives to hazardous products. Placing hazardous products in the trash or down the drain is harmful and illegal. Residents can safely dispose of unwanted household hazardous products, for free, at the HazoHouse, located at the Waste and Recovery Center. The WasteMobile also services rural locations throughout the County. The Swap Shop at HazoHouse offers some of these items that are in good condition for re-use. This has diverted several tons of usable items from costly disposal, and been a great opportunity for hundreds of residents.

**Table VIII-1
Thurston County Land Cover, 2000**

Jurisdiction	Land Cover					Total Land Area	
	Urban	Forest	Non-Forest Veg/Soils	Mining	Water		
Bucoda	52	47	176	0	0	274	
	%	19%	17%	64%	0%	100%	
Lacey	City	2,920	3,126	4,081	62	220	10,409
	%	28%	30%	39%	1%	2%	100%
	UGA	2,361	2,540	5,280	55	525	10,760
	%	22%	24%	49%	1%	5%	100%
Olympia	City	3,934	2,592	4,259	0	347	11,132
	%	35%	23%	38%	0%	3%	100%
	UGA	706	1,408	2,656	18	75	4,863
	%	15%	29%	55%	0%	2%	100%
Rainier	City	179	267	540	0	0	987
	%	18%	27%	55%	0%	0%	100%
	UGA	39	142	256	0	0	437
	%	9%	33%	59%	0%	0%	100%
Tenino	City	184	56	260	0	0	499
	%	37%	11%	52%	0%	0%	100%
	UGA	26	440	263	0	2	731
	%	4%	60%	36%	0%	0%	100%
Tumwater	City	1,835	1,084	3,427	48	34	6,428
	%	29%	17%	53%	1%	1%	100%
	UGA	991	2,272	5,438	10	67	8,777
	%	11%	26%	62%	0%	1%	100%
Yelm	City	597	1,159	1,810	0	1	3,567
	%	17%	32%	51%	0%	0%	100%
	UGA	260	459	1,743	0	1	2,463
	%	11%	19%	71%	0%	0%	100%
Grand Mound UGA		254	40	652	28	9	983
	%	26%	4%	66%	3%	1%	100%
Total Cities		9,701	8,331	14,553	111	602	33,297
	%	29%	25%	44%	0%	2%	100%
Total UGAs		4,638	7,301	16,287	111	679	29,015
	%	16%	25%	56%	0%	2%	100%
Total Urban Areas		14,339	15,633	30,840	221	1,281	62,313
	%	23%	25%	49%	0%	2%	100%
Rural Uninc. County		10,202	238,214	154,568	1,291	5,101	409,375
	%	2%	58%	38%	0%	1%	100%
Thurston County Total		24,540	253,847	185,407	1,512	6,381	471,687
	%	5%	54%	39%	0%	1%	100%

Source: Land Cover Mapping of Thurston County, Methodology and Applications, TRPC, 2001.

Explanations: Numbers may not add due to rounding. Land cover shown in acres.

Table VIII-2
Estimate of Forest Harvest Activity in Thurston County
1985-2000

WATERSHED	Total Land Area (acres)	Estimate of Total Forest Lands 2000 (acres)	Total Harvest 1985-2000 (acres)	% of Total Forest Lands 1985-2000
BLACK RIVER	78,971	45,107	8,888	20%
BUDD/DESCHUTES	104,019	59,267	9,842	17%
CHEHALIS RIVER	47,034	21,636	4,763	22%
ELD INLET	23,534	15,593	2,175	14%
HENDERSON INLET	27,170	9,207	355	4%
NISQUALLY RIVER	93,302	55,377	7,318	13%
SKOOKUMCHUCK RIVER	55,163	42,237	15,947	38%
TOTTEN INLET	21,401	16,546	2,833	17%
WEST CAPITOL FOREST	19,272	17,472	3,843	22%
TOTAL	469,867	282,441	55,964	20%

Source: *The Rate of Urbanization and Forest Harvest in Thurston County, 1985-2000*, TRPC, 2002.
 See Map 19 for Watershed boundaries.

Table VIII-3
Acres of Land Enrolled in Various Tax Protection Programs
Thurston County, Tax Years 1990-2009

Years	Open Space Tax Program			Other Forest Lands		Total Classified and Designated
	Agriculture	Open Space	Timber Lands	Classified	Designated	
1990	39,970	2,291	2,046	62,858	74,894	137,752
1991	40,825	2,278	2,030	61,507	72,227	133,734
1992	40,991	2,278	2,082	60,736	68,138	128,874
1993	40,868	2,358	2,186	60,736	69,987	130,723
1994	40,614	2,366	2,143	60,741	69,417	130,158
1995	39,135	2,468	2,203	60,736	70,066	130,801
1996	38,984	2,524	2,202	60,736	69,616	130,352
1997	38,966	2,556	2,238	60,150	69,573	129,723
1998	37,994	2,594	2,235	44,376	83,643	128,019
1999	39,333	2,594	2,259	45,598	85,124	130,721
2000	38,766	2,594	2,203	45,598	84,684	130,282
2001	38,426	2,603	2,181	45,588	84,614	130,202
2002 ¹	38,078	2,603	2,265	N/A	128,989	N/A
2003	37,911	2,619	2,230	N/A	130,448	N/A
2004	37,783	2,705	2,203	N/A	130,336	N/A
2005	36,963	2,798	2,146	N/A	129,550	N/A
2006	35,905	2,840	2,110	N/A	128,726	N/A
2007	35,207	3,106	2,170	N/A	127,255	N/A
2008	34,774	3,125	2,156	N/A	126,968	N/A
2009 ²	34,492	3,224	2,156	N/A	129,907	N/A

Source: Thurston County Assessor's Office; TRPC.

Explanations: Includes those lands subject to current use assessments under the Open Space Taxation Act (CH. 84.34 RCW), classified as timberlands (RCW 84.33.120), or designated as timberlands (RCW 84.33.130).

¹Substitute Senate Bill 5702 which passed in the 2001 legislative session combined classified forest land and designated forest land into one category - designated forest land. The classified forest land category was eliminated.

²Data analyzed by TRPC in 2009. May be incompatible with previous years.

**Table VIII-4
Urbanization by Watershed in Thurston County, 1985-2000**

WATERSHED	1985-2000 Conversion from:				Total (acres)	Percent of Total
	Total Land Area (acres)	Forested Lands (acres)	Agriculture Lands (acres)	Shrub Lands (acres)		
BLACK RIVER	78,971	4,248	2,110	1,551	7,908	10%
BUDD/DESCHUTES	104,019	4,422	1,427	1,299	7,149	7%
CHEHALIS RIVER	47,034	699	3,264	505	4,468	9%
ELD INLET	23,534	1,193	73	199	1,464	6%
HENDERSON INLET	27,170	1,322	1,470	420	3,212	12%
NISQUALLY RIVER	93,302	6,115	1,275	98	7,489	8%
SKOOKUMCHUCK RIVER	55,163	35	236	20	291	1%
TOTTEN INLET	21,401	519	39	66	623	3%
WEST CAPITOL FOREST	19,272	0	0	0	0	0%
TOTAL	469,867	18,553	9,893	4,159	32,605	7%

Source: The Rate of Urbanization and Forest Harvest in Thurston County, 1985-2000, TRPC, 2002.

Explanations: Conversion designates the loss of one type of land use (forested, agriculture, or shrub) and replacement by an urban landscape. Urban landscapes contain a mixture of built features, landscaping, and natural features.

See Map 19 for Watershed boundaries.

Table VIII-5
Change in Urban (Built) Land Cover in Thurston County, 1985-2000

WATERSHED	Total (acres)	2000 Urban Cover		1985 Urban Cover		1985-2000 Increase in Urban Cover		
		(acres)	(%)	(acres)	(%)	(acres)	(% of Total)	(% of 1985)
BLACK RIVER	78,971	2,507	3%	1,795	2%	712	1%	40%
BUDD/DESCHUTES	104,019	8,864	9%	7,154	7%	1,710	2%	24%
CHEHALIS RIVER	47,034	2,040	4%	1,517	3%	524	1%	35%
ELD INLET	23,534	932	4%	765	3%	166	1%	22%
HENDERSON INLET	27,170	4,757	18%	3,623	13%	1,135	4%	31%
NISQUALLY RIVER	93,302	4,196	4%	2,998	3%	1,198	1%	40%
SKOOKUMCHUCK RIVER	55,163	693	1%	641	1%	52	0%	8%
TOTTEN INLET	21,401	400	2%	354	2%	45	0%	13%
WEST CAPITOL FOREST	19,272	131	1%	131	1%	0	0%	0%
TOTAL	469,867	24,520	5%	18,979	4%	5,541	1%	29%

Source: The Rate of Urbanization and Forest Harvest in Thurston County, 1985-2000, TRPC, 2002.
 See Map 19 for Watershed boundaries.

**Table VIII-6
Estimate of Total Impervious Area by Watershed, 2000-2030**

WATERSHED	Total Acres	2000 Land Cover		Forecast 2030	
		(acres)	(percent)	(acres)	(percent)
BLACK RIVER	78,971	2,640	3.3%	4,894	6.2%
BUDD/DESCHUTES	104,019	9,039	8.7%	12,142	11.7%
CHEHALIS RIVER	47,034	2,214	4.7%	4,022	8.6%
ELD INLET	23,534	944	4.0%	1,564	6.6%
HENDERSON INLET	27,170	4,889	18.0%	6,572	24.2%
NISQUALLY RIVER	93,302	4,354	4.7%	7,355	7.9%
SKOOKUMCHUCK RIVER	55,163	1,422	2.6%	1,699	3.1%
TOTTEN INLET	21,401	400	1.9%	711	3.3%
WEST CAPITOL FOREST	19,272	131	0.7%	131	0.7%
Total	469,867	26,032	5.5%	39,091	8.3%

Source: Completion of the Future Impervious Area Module Update - January 2007.

www.trpc.org/resources/memojan2007.pdf

Note: Estimate includes residential and commercial growth.

**Table VIII-7
Estimate of Effective Impervious Area by Watershed, 2000-2030**

WATERSHED	Total Acres	2000 Land Cover		Forecast 2030	
		(acres)	(percent)	(acres)	(percent)
BLACK RIVER	78,971	1,828	2.3%	3,515	4.5%
BUDD/DESCHUTES	104,019	6,797	6.5%	9,153	8.8%
CHEHALIS RIVER	47,034	1,541	3.3%	2,893	6.2%
ELD INLET	23,534	681	2.9%	1,147	4.9%
HENDERSON INLET	27,170	3,665	13.5%	4,964	18.3%
NISQUALLY RIVER	93,302	3,134	3.4%	5,409	5.8%
SKOOKUMCHUCK RIVER	55,163	541	1.0%	746	1.4%
TOTTEN INLET	21,401	287	1.3%	520	2.4%
WEST CAPITOL FOREST	19,272	90	0.5%	90	0.5%
Total	469,867	18,564	4.0%	28,437	6.1%

Source: Completion of the Future Impervious Area Module Update - January 2007. <http://www.trpc.org/resources/memojan2007.pdf>

Note: Estimate includes residential and commercial growth.

**Table VIII-8
Municipal Parks by Jurisdiction, 2009**

Site, Facilities, and Services Available	Acreage
Bucoda	
Bucoda Volunteer Park Baseball, river, kitchen, playground equipment, and horseshoes.	14
Bucoda Memorial Park Memorial and picnic area.	0.8
Bucoda RV Park Sixteen campsites with water and power. Campfire areas, restrooms with showers, and dumpstation. Located next to Bucoda Volunteer Park.	0.4
Bucoda Penitentiary Park Picnic area, trails to and along river.	1.5
Total Bucoda	17
Lacey	
Avonlea Park Picnic facilities and shelter, basketball court, playground equipment.	5.4
Brooks Park (mini-park) Turf, picnic facilities, and playground equipment.	1
City Center Parks (3) Limited development.	2.5
Civic Plaza Flag plaza and armed forces monument.	
Community Center 9,000 square foot banquet facility/meeting rooms.	
Corporate Center Mini-Park Undeveloped.	2.5
Homann Park Baseball diamond, running track, basketball hoops, picnic facilities and playground equipment, restrooms and soccer field.	8
Horizon Pointe Playground, picnic shelter, two athletic fields.	9.5
Huntamer Park Picnic facilities, covered stage, playground and restrooms.	1.5
I-5 Park Picnic equipment/adjacent to bike path.	3
Jacob Smith House National historic register; rental facility for small meetings, weddings/receptions, etc.	3.2
Lacey Museum Restored house, periodic historic displays on exhibit.	0.5
Lake Lois Park Picnic facilities, nature trails, interpretive signs.	35.5
Lakepointe Picnic facilities, 2 athletic fields, tennis court, playground equipment, and basketball court.	7.9

Source: TRPC survey of Lacey, Olympia, and Tumwater Parks Departments, Cities/Towns of Bucoda, Rainier, Tenino, and Yelm.

Note: Map 18 shows all parks in Thurston County.

**Table VIII-8, continued
Municipal Parks by Jurisdiction, 2009**

Site, Facilities, and Services Available	Acreage
<u>Lacey (continued)</u>	
Long Lake Swim, beach, picnic facilities, walking trails, restrooms, boat launch, two sand volleyball courts.	10
McAllister Park Undeveloped.	60
Meridian Campus Undeveloped.	5
Meridian Neighborhood Park Picnic facilities and shelter, basketball half-court, playground equipment, open play meadow, restroom.	24
Pleasant Glade Park Undeveloped.	32
Rainier Vista 3 baseball/softball fields, 3 soccer fields, 3 sand volleyball courts, skate park, 4 tennis courts, walking trails, 2 large picnic shelters, playground equipment, parking lot, restrooms.	46
Regional Athletic Complex 1 baseball, 4 softball, and 6 soccer fields, trails, picnic shelters and facilities, 3 basketball half courts, restrooms and concessions.	97
Senior Center 5,000 square feet located in Woodland Creek Park.	
Thornbury Park Turf play area, playground equipment, picnic shelter and facilities.	9
Timberland Wetlands Undeveloped wetlands.	32.3
Wanschers Community Park Wooded park area, lake.	16
William A. Bush Neighborhood Park Playground equipment, picnic shelter and equipment, and grass play area.	8.5
Wonderwood Park Picnic shelter and facilities, playground equipment, paved trails, restrooms, 2 softball/baseball/soccer fields, 4 tennis courts.	40
Woodland Creek Community Park Lacey Community Center; youth fishing pond, future cultural arts building, site for new Senior Center, walking trails, picnic facilities and shelters, playground equipment and restrooms.	72
Total Lacey	532
<u>Olympia</u>	
8th Ave Neighborhood Park Undeveloped neighborhood park.	4
Decatur Woods Park Picnic tables, playground, restrooms, trail, public art.	6.3
Bigelow Park Picnic and playground equipment, restrooms, small play field, basketball court, public art.	1.9
Bigelow Springs Spring, interpretive signs, seating areas, view of city, picnic areas.	1.3
Burri Park Neighborhood park with swings, small grassy area, and picnic tables.	2.3
Cain Road Park Neighborhood park with swings, small grassy area, and picnic tables.	4
Chambers Lake Parcel Undeveloped open space.	46.2
Cooper Crest Parcel Forested ravine with nature trail.	13.4
East Bay Waterfront Park Scenic waterfront park, interpretive signs, picnic areas, viewing platform.	1.9

Source: TRPC survey of Lacey, Olympia, and Tumwater Parks Departments, Cities/Towns of Bucoda, Rainier, Tenino, and Yelm.

Note: Map 18 shows all parks in Thurston County.

Table VIII-8, continued
Municipal Parks by Jurisdiction, 2009

Site, Facilities, and Services Available	Acreage
Olympia (continued)	
Evergreen Park Drive Neighborhood Park Neighborhood park with swings, small grassy area, picnic tables and bocce court.	4
Friendly Grove Park Shelter, playground, picnic area, skate court, basketball court, tennis court, paved trail, public art.	14.5
Garfield Nature Trail Forested ravine nature trail between West Bay Drive and Rogers Street.	7.4
Grass Lake Refuge Wildlife refuge with minimally improved trails.	172.4
Greene Parcel Undeveloped community park.	3.5
Harry Fain's Legion Park Picnic shelter, playground equipment, nature trail.	1.2
Henderson Road Neighborhood Park Undeveloped neighborhood park.	4.8
Heritage Fountain Scenic park, walkways, benches, interactive fountain.	1.2
Yashiro Japanese Garden Small Japanese ornamental garden, walkway, water features, public art. Present from sister city Yashiro, Japan.	0.7
LBA Park Picnic shelter and picnic areas, playgrounds, basketball, tennis, ballfield complex, restrooms, paved trail, summer concession stands.	22.6
Lions Park Play equipment, picnic shelter and picnic areas, restrooms, horseshoe pits, 2 tennis courts, play field, public art.	3.7
Madison Scenic Park Park with walkways, benches, scenic views.	2.2
Margaret McKenny Park Neighborhood park with swings, grassy area, short trail, picnic tables, and basketball hoop.	4.1
McRostie Parcel Undeveloped open space.	0.2
Mission Creek Park Undeveloped neighborhood park.	7.6
Mission Creek Refuge Open space with trail network.	29.2
O'Connor Parcel Undeveloped open space.	4.5
Olympia Woodland Trail Urban trail corridor with paved, multi-use trail and restrooms.	31
Percival Landing Walking and picnic areas, playground, overnight boat moorage, 4,000 ft. boardwalk, public showers/restrooms, public art.	3.4

Source: TRPC survey of Lacey, Olympia, and Tumwater Parks Departments, Cities/Towns of Bucoda, Rainier, Tenino, and Yelm.

Note: Map 18 shows all parks in Thurston County.

Table VIII-8, continued
Municipal Parks by Jurisdiction, 2009

Site, Facilities, and Services Available	Acreage
<u>Olympia (continued)</u>	
Priest Point Park Large forested park, memorial garden, picnic and group gathering facilities, playground equipment, basketball, beach, nature trails.	313.5
South Capitol View Point Small scenic viewpoint with benches.	0.9
Stevens Field Ballfield complex, playground, picnic areas, restrooms, 2 tennis courts.	13
Sunrise Park Playground and picnic areas, basketball court, paved trail, view of Mt. Rainier.	5.7
The Olympia Center Community center, meeting rooms, gymnasium, classrooms, kitchen facilities.	1.3
Trillium Park Forested ravine with nature trail that leads to small pond.	4.5
Ward Lake Park Undeveloped freshwater swimming access - closed to public access	9.1
Watershed Park Large forested open space with springs and creek, 1-1/2 mile trail, and old growth temperate rain forest.	153
West Bay Park Undeveloped waterfront park, closed to public access.	17
Wildwood Glen Undeveloped open space.	2.4
Woodruff Park Tennis courts, picnic tables, sand volleyball court, restrooms.	2.4
Yauger Park Ballfield complex, skate court, restrooms, concession building, picnic shelter, horseshoe pits, playground, jogging track, open space, picnic facilities, interpretive trail, basketball.	39.8
Total Olympia	962
<u>Rainier</u>	
Gehrke Park Playground equipment, open space, shelter, and ballfield.	3.5
Holiday Park Grass, flowers, benches, and a gazebo.	0.3
Raintree Park Basketball court, picnic tables, grassy park.	0.5
Veteran's Memorial Park Wall of remembrance, flag plaza, benches, paved pathways connecting with Yelm to Tenino trail, flowering cherry trees and grassy area.	0.3
Wilkowski Park Grassy open space, BBQ pit, three fire rings, picnic shelter, baseball field, restrooms.	3.5
Total Rainier	8
<u>Tenino</u>	
Tenino City Park Overnight camping, picnic areas, restrooms, softball, swimming, playground equipment, trails, 4 ball fields, covered shelter, Quarry House (rental facility), Depot Museum, 75 percent of park in natural state.	45
Total Tenino	45

Source: TRPC survey of Lacey, Olympia, and Tumwater Parks Departments, Cities/Towns of Bucoda, Rainier, Tenino, and Yelm.

Note: Map 18 shows all parks in Thurston County.

Table VIII-8, continued
Municipal Parks by Jurisdiction, 2009

Site, Facilities, and Services Available	Acreage
Tumwater	
5th and Grant Park Playground equipment, basketball hoop, scenic view of Capitol Dome and Lake.	0.3
Barclift Park Picnic area, shelter, basketball and tennis courts, walking trail and children's play toys.	3
Jim Brown Park Basketball court, play toys, tennis court, picnic areas.	1.4
Overlook Park Picnic areas, scenic views.	1
Palermo Pocket Park Playground equipment, basketball court.	0.3
Pioneer Park Restrooms, 3 soccer fields, 3 ball fields, 1 1/2 mile trails, river access.	85
Tumwater Hill Park Baseball field, picnic areas, and 3/4 mile of trails.	9
Tumwater Historical Park Canoe launch, picnic and playground equipment, reservable picnic shelter, nature trail, restrooms.	17
Tumwater Valley Municipal Golf Course 18-hole golf course with driving range, pro-shop, and restaurant.	232
V Street Park Playground equipment, basketball court.	0.6
Total Tumwater	350
Yelm	
Cochrane Park Pedestrian paths, picnic tables, benches, catch & release pond with dock, barbecue pits and two covered picnic shelters.	8
Yelm City Park Playground equipment, picnic areas, kitchen, stage, softball, restrooms, 3 buildings for fair booths and bingo, outside amphitheater and skateboard park.	4
Longmire Community Park Recreational ballfields, trails, and playground equipment. Dedicated on April 19, 2008.	13
Total Yelm	25
Total Municipal Parks	1,939

Source: TRPC survey of Lacey, Olympia, and Tumwater Parks Departments, Cities/Towns of Bucoda, Rainier, Tenino, and Yelm.

Note: Map 18 shows all parks in Thurston County.

Table VIII-9
County, State, and Federal Managed Lands and Parks in Thurston County, 2009

Site, Facilities, and Services Available	Acreage
Thurston County	
Black River - Mima Prairie Glacial Heritage Preserve Southwest of Littlerock on the Black River, undeveloped.	1,020
Black River Natural Area Natural habitat area on the Black River near Rochester. Currently no public access.	13
Boston Harbor Boat Launch Boat launch, saltwater access, restrooms.	1
Burfoot County Park Saltwater access, picnic areas, playground equipment and shelters (reserve picnics for large groups), trails, restrooms.	60
Chehalis Western Trail 15.5 miles of abandoned railroad right-of-way for trail from Pacific Avenue in Lacey to Vail; 14.5 miles of trail paved with trailhead facilities at 14th Avenue, 67th Avenue and Fir Tree Road. Trail connection to Yelm-Tenino Trail completed and opened for public use in 2003. In 2009, the County acquired an additional 5.5 miles of the trail from the Washington State Department of Natural Resources. This section of trail spans from Woodard Bay into Lacey; 4 miles of it features development for pedestrian, bicycle and equestrian use. The Chehalis Western Trail and Woodard Bay Natural Resource Conservation Area (NCRA) are linked.	202
Chehalis Western Trailhead (89th Avenue) Proposed trailhead to access Chehalis Western Trail, undeveloped; Phase I development to be constructed in 2010.	10
Chehalis Western Trailhead (Vail Loop) Proposed trailhead to access the southern end of the Chehalis Western Trail, undeveloped; 1/2 mile Deschutes River frontage.	3
Cooper Point Park Saltwater access, undeveloped.	30
Deschutes Falls County Park River access in Bald Hills area, undeveloped.	155
Deschutes River Park Future access point to Chehalis Western Trail, including 3/4 mile frontage along Deschutes River, undeveloped.	50
Fort Eaton Monument Site Historic site, stone monument marking the site of the fort used during the Indian War of 1855.	1
Frye Cove County Park Saltwater access, nature trails, picnic areas, shelters, restrooms, play area.	86
Gate to Belmore Trail 12.45 miles of abandoned railroad right-of-way for trail linking Kenneydell Park, Tumwater and the Rochester-Gate area; includes several access points along Black River and various preserve areas. Undeveloped.	243
Griffin Athletic Fields Joint county/Griffin School District athletic complex that includes two soccer fields and a softball/baseball field, walking path, picnic areas and parking.	40
Guerin County Park Black Lake access, undeveloped.	41
Indian Road County Park Saltwater access, undeveloped.	5

Source: TRPC survey of Thurston County Parks Department, U.S. Fish and Wildlife Service, National Forest Service, Washington State Department of Game, Washington State Department of Natural Resources, Washington State Parks.

Note: Map 18 shows all parks in Thurston County.

Table VIII-9, continued
County, State, and Federal Managed Lands and Parks in Thurston County, 2009

Site, Facilities and Services Available	Acreage
Thurston County (continued)	
Johnson Point Wetlands Preserve Undeveloped.	26
Kenneydell Park Freshwater beach including restrooms, swim area, nature trails, individual and group picnic facilities, disabled-accessible fishing area, and indoor lodge reserved for group rentals. Phase II development to construct additional parking, restroom, and athletic fields in 2009-2010.	41
Lake Lawrence County Park Lake Lawrence access, undeveloped.	15
Louise H. Meyers County Park On Totten Inlet, no water access, undeveloped.	38
Mima Prairie Pioneer Cemetery Historic site.	2
Rainier View Park Destination park located along the Chehalis Western Trail near Vail, undeveloped; Deschutes River frontage. River frontage.	54
Ruth Prairie Park Destination park located along the Chehalis Western Trail near Vail, undeveloped; Deschutes River frontage.	35
Thurston County Fairgrounds Picnic, ball fields, RV and boat storage. Groups may use facilities including building by arrangement.	27
Thurston County/Lacey Regional Athletic Complex (RAC) Joint county/city athletic complex to include 6 soccer and 5 softball/baseball fields, basketball courts, picnic areas, shelters, restrooms and other amenities. Phase I development of 4 soccer fields and support facilities opened for public use in 2005. Development plans ongoing. Phase II development for facility completion begins spring 2008.	68
Woodland Creek Wetlands Preserve South Bay near Henderson Inlet, undeveloped.	75
Yelm to Tenino Trail 14.42 miles of abandoned railroad right-of-way linking Yelm, Tenino, and Chehalis Western Trail; 3/4 mile frontage on McIntosh Lake and access to Deschutes River. 12 miles paved from Yelm to Tenino, with trailheads in each city. Development plans ongoing.	400
Total Thurston County	2,741
U.S. Fish and Wildlife Service	
Nisqually National Wildlife Refuge Wildlife habitat, wildlife-related recreation; 1 mile accessible hiking trail open year round; Environmental Education Center (reservation only); observation deck open to public; \$3.00 entrance fee per family; Visitor Center is open 9 a.m. to 4 p.m., Wednesday through Sunday.	2,945
Total U.S. Fish and Wildlife Service	2,945
U.S. Forest Service	
Mount Baker - Snoqualmie National Forest Public access via low standard forest service roads (land administered by Gifford Pinchot National Forest, Cowlitz Valley Ranger District).	640
Total U.S. Forest Service	640

Source: TRPC survey of Thurston County Parks Department, U.S. Fish and Wildlife Service, National Forest Service, Washington State Department of Game, Washington State Department of Natural Resources, Washington State Parks.

Note: Map 18 shows all parks in Thurston County.

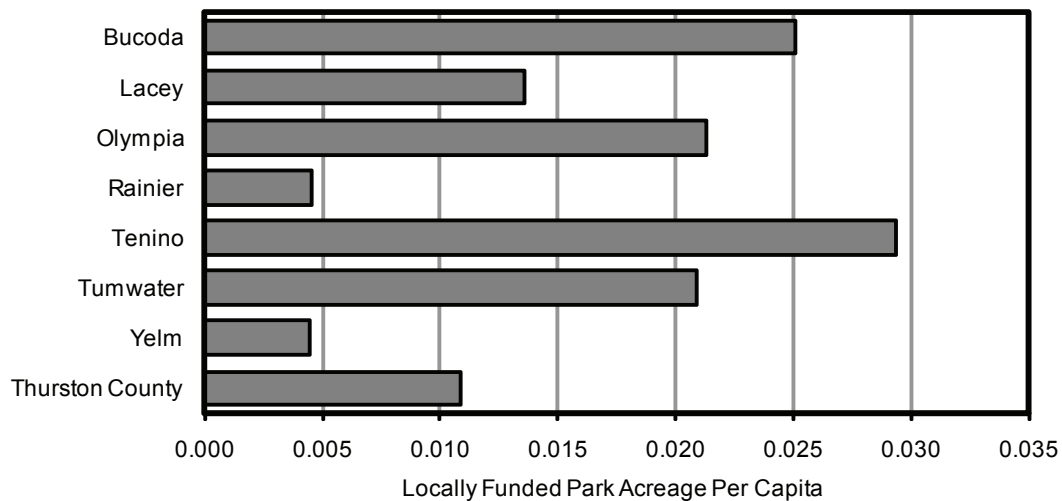
Table VIII-9, continued
County, State, and Federal Managed Lands and Parks in Thurston County, 2009

Site, Facilities and Services Available	Acreage
<u>Washington State General Administration</u>	
Capitol Campus	21
Public open space, fountain, rose garden, memorials, trail to Capitol Lake, and an overlook plaza North of the Temple of Justice.	
Capitol Lake Basin, Heritage Park, and Marathon Park	77
Linking trails and sidewalks, restrooms, and picnic tables at Marathon Park and Heritage Park. Heritage Park is developed with a trail from the West Capitol Campus, lake edge promenade, great lawn and lawn amphitheater, and restrooms. Future development will include a new restroom, and completion of plans for additional landscaping and park furnishings.	
Sylvester Park	1.5
Benches and performance gazebo.	
Total Washington State General Administration	
100	
<u>Washington State Parks and Recreation Commission</u>	
Elbow Lake State Park	320
Undeveloped, boating, fishing, and hiking, walk in only.	
Millersylvania State Park	844
Picnicking, swimming, fishing, boat launch, hiking, both tent camping and full hook-up, lakefront, exercise and fitness trails, kitchens, reservable cottage, and Environmental Learning Center.	
Nisqually-Mashel State Park	1,230
At confluence of Nisqually and Mashel Rivers in southeast county; undeveloped. Fishing, rafting, hiking, bird watching, picnicking and mountain biking.	
Tolmie State Park	106
Puget Sound frontage, picnicking, beach walking, clamming, fishing, underwater reefs for scuba diving, kitchens, mooring buoys, and hiking trails. No overnight camping.	
Total Washington State Parks and Recreation Commission	
2,500	
Total Federal and State Lands	
104,009	

Source: TRPC survey of Thurston County Parks Department, U.S. Fish and Wildlife Service, National Forest Service, Washington State Department of Game, Washington State Department of Natural Resources, Washington State Parks.

Note: Map 18 shows all parks in Thurston County.

Figure VIII-1
Per Capita Park Acreage for Locally Funded Facilities
Thurston County Jurisdictions, 2009



Source: TRPC; Parks Departments of Lacey, Olympia, Tumwater, and Thurston County; City Halls of Rainier, Tenino, and Yelm.
Explanations: See Tables VIII-6 and VIII-7 for supporting data. Park acreage used to determine per capita figures in this graph include only those facilities funded by each respective jurisdiction and may not include all parks located in those jurisdictions. The Thurston County Comprehensive Plan states that “the county focuses on providing parks, trails and preserves that contain special features intended to be used by all residents of the County, inside and outside cities.” Therefore, Thurston County parks per capita reflect County-owned parks and preserves compared to total County population, rather than the unincorporated portion of the County.

Table VIII-10
Annual Emission Inventory, 1997-2008
Thurston County Regulated Point Source Pollutants,
in Tons per Year

Year	Pollutant				
	PM ₁₀	SO ₂	NO ₂	CO	VOCs
1997	13	12	71	17	794
1998	15	35	77	23	681
1999	15	12	76	26	637
2000	14	30	68	56	522
2001	14	15	76	67	558
2002	15	21	94	84	475
2003	14	15	53	39	501
2004	12	7	39	37	496
2005	13	1	41	31	516
2006	16	1	59	31	559
2007	17	1	73	39	435
2008	13	0	49	30	283

Source: Olympic Region Clean Air Agency (ORCAA) (www.orcaa.org).

Explanations: Actual emissions for criteria pollutants. Sources must have emissions of approximately five tons or more a year. ORCAA (formerly the Olympic Air Pollution Control Authority) regulates facilities that emit large volumes of pollutants from a single location.

PM₁₀ = Particulate matter.

SO₂ = Sulfur dioxide.

NO₂ = Nitrogen dioxide.

CO = Carbon monoxide.

VOCs = Volatile organic compounds, a precursor for the formation of Ozone.

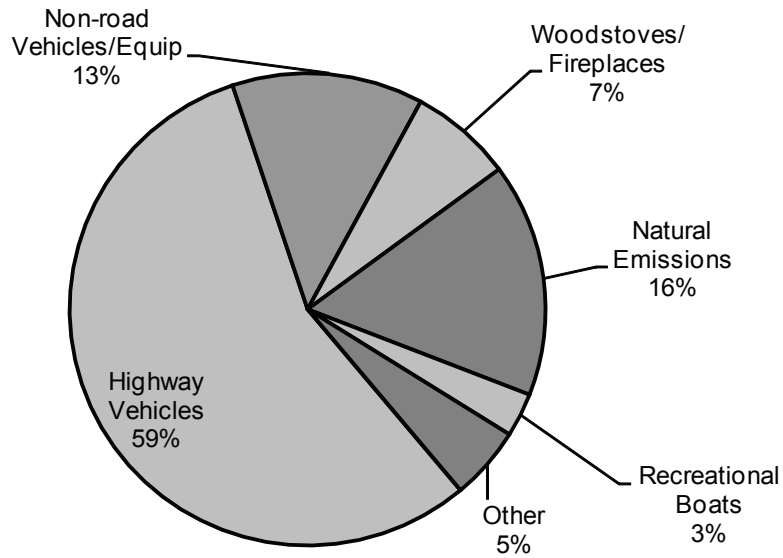
Table VIII-11
Air Pollution Sources in Thurston County

Source	Tons	% of Total
Highway Vehicles	67,369	56.4%
Natural Emissions	18,924	15.8%
Non-road Vehicles and Equipment	15,630	13.1%
Woodstoves/Fireplaces	7,845	6.6%
Recreational Boats	3,277	2.7%
Other	6,500	5.4%
Totals	119,545	100%

Source: Washington State Department of Ecology, Air Quality Program. 2005 Comprehensive Emissions Inventory.

Explanations: This data set covers several “criteria” air pollutants, including carbon monoxide, particulate matter, sulfur dioxide, and nitrogen oxides. It also includes measurements of volatile organic compounds and ammonia.

Figure VIII-2
Air Pollution Sources in Thurston County, 2005



Source: Washington State Department of Ecology, Air Quality Program.

Table VIII-12
Air Quality Monitoring, Thurston County, 1985, 1990, 1995, 2000, 2005-2008

Pollutant	National Standards	Readings	1985	1990	1995	2000	2005	2006	2007	2008
Particulate Matter ¹ (PM10) 24 Hour Average	150 micrograms per cubic meter	1st Maximum	254	141	76	47	32	41	N/A ⁶	N/A ⁶
		2nd Maximum	249	86	65	36	32	16	N/A ⁶	N/A ⁶
Particulate Matter ² (PM10) 24 Hour Average	150 micrograms per cubic meter	1st Maximum	N/A	N/A	N/A	51	35	53 ⁶	47 ⁶	58 ⁶
		2nd Maximum	N/A	N/A	N/A	39	35	45 ⁶	47 ⁶	52 ⁶
Particulate Matter (PM2.5) 24 Hour Average	35 ⁵ micrograms per cubic meter	1st Maximum	N/A	N/A	N/A	46.3	47.6 ⁴	47.3 ⁴	41.4 ⁴	51.8 ⁴
		2nd Maximum	N/A	N/A	N/A	40.8	36.1 ⁴	39.3 ⁴	41.4 ⁴	46.4 ⁴
Particulate Matter (PM2.5) Annual Average	15 micrograms per cubic meter		N/A	N/A	N/A	10.34	8.7 ⁴	7.7 ⁴	7.8 ⁴	8.4 ⁴
Ozone 1 Hour Average	0.12 parts per million ⁷	1st Maximum	N/A	N/A	N/A	0.086	0.074	0.093	0.093	0.081
		2nd Maximum	N/A	N/A	N/A	0.079	0.070	0.081	0.073	0.075
Ozone 8 Hour Average ³	0.075 parts per million	1st Maximum 4th Maximum	N/A N/A	N/A N/A	N/A N/A	0.073 N/A	0.063 0.059	0.084 0.068	0.068 0.054	0.067 0.060

Source: Olympic Region Clean Air Agency, www.orcaa.org (formerly the Olympic Air Pollution Control Authority)

Explanations: ¹Particulate matter 10 micrometers or smaller in diameter at standard conditions.

²Particulate matter 10 micrometers or smaller in diameter at local conditions.

³To attain this standard the 3-year average of the fourth highest daily maximum 8-hour average ozone concentration measured at each monitor within an area over each year must not exceed 0.075 ppm. (effective May 27, 2008)

⁴PM2.5 Reference Method sampling discontinued February 27, 2004 and replaced with continuous method sampling at local conditions.

⁵PM2.5 Standard revised from 65 to 35 micrograms per cubic meter effective December 17, 2006 (3-year average of the 98 percentile of 24-hour concentrations must be less than 35).

⁶PM10 Reference Method sampling discontinued April 30, 2006 and replaced with continuous method sampling.

⁷As of June 15, 2005, EPA revoked the 1 hour ozone standard in Washington State.

Table VIII-13
Water Quality Concern Index for South Puget Sound Inlets
1994-2000 and 2001-2005

Inlet	Year	DO	FCB	DIN	NH4	Stratif	Concern
Budd Inlet	1994-2000	Very Low	High	Low	High	P	Very High
Budd Inlet - South Port	2001-2005	Very Low	High	High	High	SI	Very High
Budd Inlet - Olympia Shoal	2001-2005	Very Low	High	Moderate	Moderate	MI	Very High
Nisqually Reach	2001-2005	Very Low	Low	High	Moderate	WI	High
Totten Inlet	1994-2000	-	-	Moderate	Moderate	E	Moderate
Totten Inlet	2001-2005	High	Low	High	Moderate	MI	Low
Henderson Inlet	2001-2005	Low	Low	High	Low	WI	Low
Eld Inlet	1994-2000	-	-	Moderate	-	S	Low

Source: Department of Ecology, Water Quality - http://www.ecy.wa.gov/programs/eap/mar_wat/flight_examples.html (1994-2000) and http://www.psp.wa.gov/downloads/SOS07/2007_PS_Update.pdf (2001-2005).

Explanations: DO indicates when waters have had low (<5 mg/L) or very low (<3 mg/L) oxygen concentrations, which can be harmful to some marine organisms, such as fish.

FCB refers to where fecal coliform bacteria are been detected at moderate (>14 orgs/100 mL once or more), high (chronic >14 or >50 once), or very high levels (chronic and >50 orgs/100 mL), which can often be indicative of sewage or agricultural contamination.

DIN refers to where nitrogen dissolved nutrients are at presumably limiting concentrations for consecutive months (3 mo = moderate; 5 mo = low), indicating areas that would be susceptible to added nutrients from point and non-point sources, resulting in reduced water quality.

NH4 relates the finding of high (>0.14 mg/L) or moderate (0.07 mg/L) concentrations of ammonium, which is sometimes indicative of human sources of organic waste, such as sewage or agricultural runoff.

Stratif stands for the natural amount of density stratification that the location has, which influences how readily pollutants will be mixed out or low oxygen concentrations persist. For 1994-2000 data - P=persistent; S=seasonal; E=episodic; W=weak.

For 2001-2005 data: SP = Strong and persistent; SI = Strong and intermittent; MI = Moderate and infrequent;

M Int = Moderate and intermittent; WI = Weak and infrequent.

Table VIII-14
Solid Waste, Thurston County, 1995, 2000, 2005-2008

	1995	2000 ¹	2005	2006	2007	2008
Recycling (tons)						
Residential Organics collection	7,102	6,000	13,079	16,107	20,947	20,693
Regional Blue Box Sites	1,972	1,585	3,194	3,141	2,791	2,669
Curbside - Thurston County	10,172	7,225	9,508	9,615	13,169	14,041
Curbside - Olympia	3,194	4,400	4,989	5,103	5,115	5,128
Recycle Center at transfer station	1,736	1,500	1,504	1,502	1,438	1,200
Total Recycling²	24,176	20,710	32,274	37,807	43,460	43,731
Landfill Solid Waste (tons)	123,771	149,842	175,945	190,837	196,221	177,660
Population	189,201	204,700	224,100	231,100	238,000	245,300
Recycling Pounds per Capita	256	202	288	327	365	357
Landfill Waste Pounds per Capita	1,308	1,464	1,570	1,728	1,649	1,449

Source: Thurston County Solid Waste.

Explanations: ¹Some 2000 data are estimated.

²Does not include business recycling, backyard composting or self-haulers that take recyclables to Pacific Disposal or other locations.