

# Environment

Residents of the Thurston Region want a healthy environment with clean air for breathing and clean water for drinking, recreating, and harvesting food. In coming decades, sustaining the natural environment will require protecting water quality and quantity and reducing emissions that contribute to air pollution and climate change.



Our region has a strong commitment to environmental protection. In a 2011 Sustainable Thurston survey, the top three issues identified by people as important to build a community that is sustainable for everyone were:

1. Maintain drinking water;
2. Maintain stream and Puget Sound water quality; and,
3. Maintain air quality.



Our region recognizes that protecting environmental quality is good for economic health and our quality of life. This ethic is reflected in the vision: “In one generation — through innovation and leadership — the Thurston Region will become a model for sustainability and livability. We will consume less energy, water, and land, produce less waste, and achieve carbon neutrality ...”

To achieve this bold vision, we set priority goals and targets related to air, waste, land, water, and greenhouse gas emissions. Goals and actions to protect the environment are embedded in all chapters of this document. This chapter’s goals and actions relate most directly to air quality, water quality, and climate change.



*I-5 traffic as seen from Boulevard Road in Olympia.*

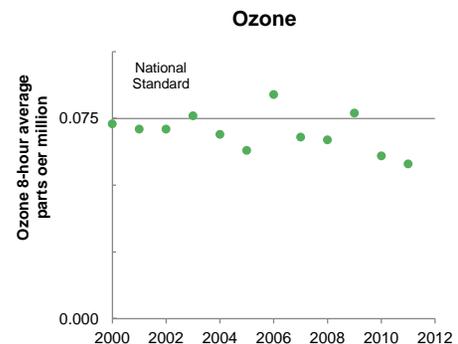
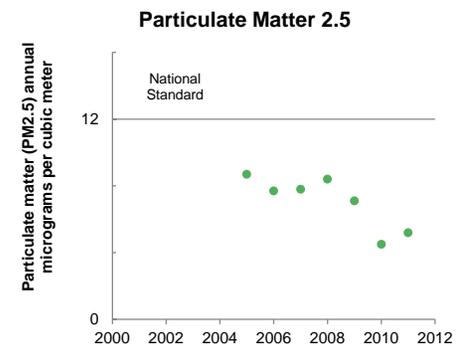
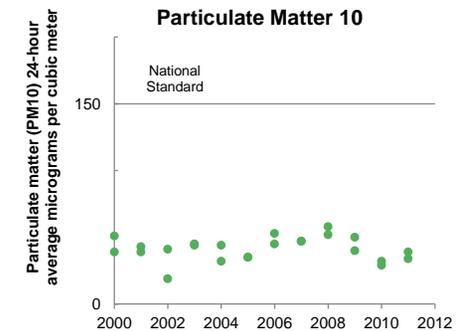
### Sustainable Thurston Foundational Principles & Policies related to the environment:

- Protect the soil, air, surface water, and groundwater quality through reducing dependence on chemicals and products that pollute and, when their use is necessary, minimizing releases to the environment.
- Ensure adequate clean water is available to support household and commercial needs while sustaining ecological systems through conservation, balancing of uses, and reuse.
- Protect our natural resources and habitat while providing for public access and sustainable uses and economic activity (forests, prairies, wetlands, surface and groundwater resources, and aquatic and terrestrial plants and animals).
- Reduce the effects of the built environment on the natural environment through land-use and transportation plans and actions that encourage compact development; retrofit existing infrastructure to reduce impacts; and reduce energy consumption and reliance on nonrenewable energy sources.
- Acknowledge that changing weather and climate patterns will impact the human, natural, and built environments and plan for impacts such as increased flooding and sea-level rise.

# Air Quality

The Clean Air Act requires the U.S. Environmental Protection Agency to set National Ambient Air Quality Standards for six criteria pollutants: carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), sulfur dioxide (SO<sub>2</sub>), and particulate matter (PM). The federal law identifies two types of national ambient air quality standards: “Primary” standards protect the health of children, elderly and other sensitive populations; “secondary” standards protect against decreased visibility, damage to animals, vegetation, and buildings. The Thurston Region must also comply with Washington Ambient Air Quality Standards (WAAQS), which will be commensurate with federal standards for criteria pollutants, effective in 2014.

- PM10: 150 micrograms per cubic meter of air ( $\mu\text{g}/\text{m}^3$ ), 24-hour average [federal primary/secondary standards]
- PM2.5: 12  $\mu\text{g}/\text{m}^3$ , annual average [federal primary/secondary standards]; 35  $\mu\text{g}/\text{m}^3$ , 24-hour average [federal primary/secondary standards]
- Ozone: 0.075 parts per million (ppm), 8-hour average [federal primary/secondary standards]
- Carbon Monoxide: 9 ppm, 8-hour average [federal primary standard]; 35 ppm, 1-hour average [federal primary standard]
- Nitrogen Dioxide: 0.053 ppm, annual average [federal primary/secondary standards]; 0.100 ppm, 1-hour average [federal primary standard]
- Sulfur Dioxide: 0.03 ppm, annual average [federal primary standard]; 0.14 ppm, 24-hour average [federal primary standard]; 75 parts per billion (ppb), 1-hour average [federal primary standard]; 0.3 ppm, 3-hour average [federal secondary standard]
- Lead: 0.15  $\mu\text{g}/\text{m}^3$ , rolling 3-month average [federal primary/secondary standards]; 1.5  $\mu\text{g}/\text{m}^3$ , quarterly average [federal primary/secondary standards]



Thurston County air quality particulate matter (PM<sub>10</sub>) 24-hour average, 1st and 2nd Maximum readings. Source: Olympic Region Clean Air Agency.

The social, environmental and economic impacts of air pollution are significant. Sulfur dioxide (SO<sub>2</sub>), which is released into the air by fossil fuel combustion at power plants, factories and other sources, can cause acid rain that damages trees, crops, wildlife, and bodies of water.

Carbon monoxide can reduce oxygen delivery to the body's organs and ultimately cause death. For people with heart disease, short-term exposure to CO further affects their body's compromised ability to respond to the increased oxygen demands of walking and other exercise.

Lead is a naturally occurring element that can be harmful to humans who inhale or ingest it, particularly for children under the age of six. Lead particles released into the air by mining, smelting and refining activities can be attached to dust, carried by the air, deposited on surface soil, and absorbed by the water we drink and the food we eat.

Nitrogen dioxide develops quickly from emissions from cars, trucks and buses, power plants, and off-road equipment and contributes to the formation of ground-level ozone and fine airborne particles. Breathing in such pollutants can trigger respiratory problems, especially for people with asthma, and lead to lost days at work and school.

TRPC's 2025 Regional Transportation Plan complies with all state and federal air quality requirements, including those pertaining to PM<sub>10</sub> — coarse particulate matter between 2.5 and 10 micrometers in diameter (less than one-seventh the width of a human hair) that is generated primarily by wood-burning stoves and vehicles. Thurston County's metropolitan area violated PM<sub>10</sub> standards a quarter-century ago but subsequently addressed that problem and will be designated as a limited-maintenance area soon due to its ongoing efforts to reduce wood smoke and per capita miles of driving.

The Olympic Region Clean Air Agency tracks ozone and particulate matter levels at its air-monitoring station in Lacey, giving the Thurston Region data from which to compare the past and present.

### **Goal E-1: Reduce air pollution that endangers human health.**

## Sustainability Activities Already Underway

### Clearing the Air with Smart Corridors

Smart Corridors — a collaborative regional project — aims to improve the operational efficiency of the transportation network. The hallmark of this multijurisdictional effort, facilitated by TRPC, is a pilot technology demonstration project for signal timing, signal coordination, and transit signal priority.



In the 1980s, the region had a wood smoke problem caused by the widespread use of low-efficiency wood stoves with incomplete combustion. The Olympic Region Clean Air Agency (ORCAA) — which has regulatory and enforcement authority for air quality issues in Clallam, Grays Harbor, Jefferson, Mason, Pacific, and Thurston counties — ran an incentive program that encouraged homeowners to replace low-efficiency wood stoves with ones that burned much more completely. The program worked, and now the Thurston Region enjoys excellent air quality. However, the region became a maintenance area for PM10 (particulate matter up to 10 micrometers in size) under federal air-quality rules. With this maintenance designation came unexpected regional transportation requirements and new federal funds — Congestion Mitigation and Air Quality (CMAQ) dollars that must target transportation sources of PM10.

Research showed signal timing, signal coordination, and transit signal priority as the best tools to meet this air quality priority. TRPC tasked a Regional Traffic Operations Group (RTOG) to define the needs, scope and cost of an implementation plan for a coordinated “smart corridors” approach along two key thoroughfares — the Martin/State/4th corridor and Capitol Boulevard/Capitol Way corridor — which connect Lacey, Olympia, and Tumwater. Interstate 5, operated by the Washington State Department of Transportation, connects to the arterials at several interchanges. Intercity Transit provides frequent bus service along the corridors. In 2013, Thurston Smart Corridors partner agencies finalized interlocal operating agreements and designed their components of the regional system.

To learn more, visit: [www.trpc.org/regionalplanning/transportation/projects/Pages/SmartCorridors.aspx](http://www.trpc.org/regionalplanning/transportation/projects/Pages/SmartCorridors.aspx)

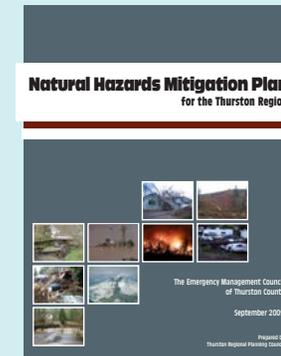
## Mitigating Natural Hazards

The question is not *if*, but *when*. When the next earthquake rattles the region, what are the risks and how can we mitigate them? Luckily, we are prepared.

The *Natural Hazards Mitigation Plan for the Thurston Region* is a multijurisdictional plan that addresses the most destructive natural hazards that threaten the Thurston Region. The plan explains the risks posed by natural hazards and identifies actions to create more disaster-resilient communities in the region.

Since 1962, 24 federal disaster declarations have cited the Thurston Region. Like other Pacific Northwest communities, the Thurston Region is vulnerable to geological and weather-related hazards. In 2003, the region was among the first in Washington State to adopt a Federal Emergency Management Agency-approved regional hazard-mitigation plan, following passage of the U.S. Disaster Mitigation Act of 2000. Hazard Mitigation planning identifies and prioritizes sustained measures that will reduce or eliminate long-term risk to people and property from natural hazards. Federal law (44 CFR Part 201) requires local governments to review, revise, and resubmit their plans for approval to remain eligible for federal mitigation funding every five years. In 2009, 17 local government partners adopted the second edition of the Natural Hazards Mitigation Plan for the Thurston Region, underscoring their efforts to make their community a safer place. Several of the region's partners have successfully implemented federally funded mitigation projects because of developing and maintaining a hazard mitigation plan.

The Thurston Regional Planning Council (TRPC) led the collaborative plan-development process, saving jurisdictions resources. TRPC continues to play a leadership role by seeking funding to update the plan, and the agency is working with Thurston County Emergency Management and Federal Emergency Management Agency (FEMA) to update portions of the region's risk assessment. All of the plan's partners have signed statements of intent to update the plan by the end of 2014. To learn more, visit: [www.trpc.org/regionalplanning/environment/Pages/NaturalHazardsMitigationPlan2ndEdition.aspx](http://www.trpc.org/regionalplanning/environment/Pages/NaturalHazardsMitigationPlan2ndEdition.aspx)



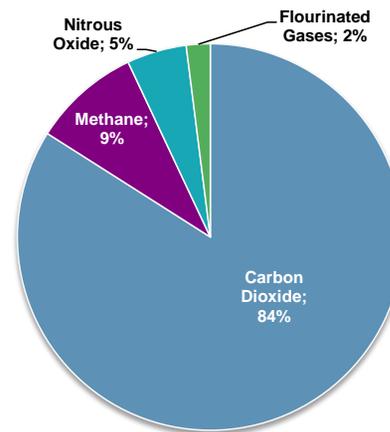
# Climate Change

The Earth’s atmosphere acts as a greenhouse. Energy from the sun is radiated back into the Earth’s atmosphere, where much of it is absorbed by “greenhouse” gases. The atmosphere then radiates most of this energy back to the Earth’s surface, making the planet warmer than it would be if the atmosphere did not contain these gases. Without this natural “greenhouse effect,” temperatures would be about 60 degrees Fahrenheit lower than they are now, and the Earth would be uninhabitable for humans.

During the past century, the amount of greenhouse gases in the atmosphere increased substantially due to the burning of oil, coal, and other fossil fuels. The added gases are enhancing the natural greenhouse effect, according to scientific research, as well as contributing to an increase in global average temperature and related climate changes.

Carbon dioxide (CO<sub>2</sub>) is the main heat-trapping gas that contributes to global climate change — hence, the term “carbon footprint.” Other anthropogenic greenhouse gas emissions include methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O) and fluorinated gases (e.g., hydrofluorocarbons). All of these gases remain in the atmosphere long enough to become mixed — meaning that the atmospheric concentration measured is roughly the same all over the world — regardless of the emissions source.

U.S. Greenhouse Gas Emissions in 2011



Total Emission in 2011 = 6.702 Million Metric Tons of CO<sub>2</sub> equivalent  
 Source: United States Environmental Protection Agency

Washington — part of the North America 2050 coalition, along with 15 U.S. states and four Canadian provinces — aims to return to its 1990 greenhouse gas emissions levels by 2020, reduce its emissions 25 percent below 1990 levels by 2035, and 50 percent below 1990 levels by 2050.

Success depends upon Washington’s cities and counties measuring and managing their emissions.

Washington’s water quality and quantity could be threatened by rising temperatures and shrinking snowpack. The state’s transportation and energy infrastructure also faces the specter of increased damage costs and disruptions from more frequent and severe flooding/sea level rise, wildfires, and changes in energy supply and demand. Planning and developing in a more sustainable manner today can help the Thurston Region deal more effectively with such threats, as well as potential climate-induced migration from other areas, in coming decades.

A priority goal of this Plan is for the Thurston Region to become a “carbon-neutral” community, which means having no net greenhouse gas emissions. This may require minimizing the region’s direct emissions through energy conservation and renewable energy consumption, as well as offsetting remaining emissions (direct and indirect) through the purchase and retirement of carbon credits.

Toward that end, the Plan’s regional greenhouse gas emissions targets — which are more aggressive than the state targets — are as follows:

- Achieve a 25 percent reduction of 1990 levels by 2020;
- Achieve a 45 percent reduction of 1990 levels by 2035;
- Achieve an 80 percent reduction of 1990 levels by 2050.

The following goal and associated actions at the end of the chapter are designed to address these challenges:

- **Greenhouse Gas Emissions:** On-road vehicles account for 44 percent of the greenhouse gas emissions in Thurston County. Carbon dioxide and other emissions are a major contributing factor to global climate change.

- **Climate Strategy:** Climate change could have impacts on infrastructure, water supplies, emergency management, food systems, and the economy. The region does not have a comprehensive climate action plan to serve as a framework for how this region can reduce its climate impacts and best respond to impacts.

## Goal E-2: Reduce the region's carbon footprint.

*Please note: Additional goals related to energy are in the Opportunities & Choices (Transportation) and Investment (Energy) chapters.*

### Sustainability Outcomes

Reducing the region’s carbon footprint protects the public health and welfare of future generations. It reduces threats to water quality and quantity, and it shows leadership and partnership with other communities to reduce threats from severe storm events, sea-level rise, and wildfires, as well as related service disruption and infrastructure repair costs. Achieving this goal also provides an opportunity for new “green” jobs and products in energy and environmental fields.

# Water Quality & Quantity

Water — an elemental part of life. Protecting the region’s ground and surface water resources — from streams and rivers to lakes and Puget Sound — is one of our biggest, toughest tasks. Success means clean and sufficient water for drinking, recreating, fishing, and harvesting shellfish today and tomorrow.

Guiding new development into urban growth areas will preserve rural areas for the next generation. However, more people and more development mean more pressure on the water resources that sustain us. Local research shows that we impact streams when we cover as little as 2 percent of a stream basin with roofs, streets, and sidewalks, and remove the forest cover.

Goals and associated actions at the end of the chapter are designed to address the following challenges:

- **Water Rights:** The amount of water available to cities and water districts for municipal use now and in the future is limited by the availability of water rights, use and infiltration of reclaimed water, as well as the success of conservation and water use efficiency efforts. Acquisition or transfer of new water rights can be a long and difficult process. Conservation also takes substantial effort. **(Goal E-3)**
- **Exempt Wells:** Exempt well owners have little or no incentive to conserve water, and additional groundwater withdrawals may affect water levels for existing wells. **(Goal E-3)**
- **Limited Funding:** Limited funding exists to preserve lands and/or construct treatment facilities that improve water quality. **(Goal E-3)**

- Water Pollution: Untreated stormwater runoff, improper use of herbicides and pesticides, failing or improperly located septic systems, septic systems in general, and incorrect disposal of hazardous material continue to threaten our water quality.

**(Goal E-3)**

- Aquatic Habitats: Intact aquatic habitats (stream corridors, wetlands, shorelines, estuaries) protect water quality.

Protecting these intact habitats will help preserve water quality.

However, many have been degraded, requiring expensive restoration. **(Goal E-4)**

- Forest Cover: Maintaining forest cover in healthy stream basins or watersheds is essential to protecting water quality.

**(Goal E-4)**

- Land Use: We are a fast-growing region, and balancing water quality with growth has been difficult. The region developed its land-use plans around political boundaries, but protecting water quality requires looking at future land use based on natural boundaries such as river basins or watersheds to address the cumulative effects of growth on water quality.

**(Goal E-4)**

- Salmon: At current funding levels, it will take 50 years to address the backlog of culverts on public roads that create fish passage barriers, which are a principle cause for the Chinook salmon’s listing as a threatened species under the Endangered Species Act. **(Goal E-4)**

- Health: Water quality plays a significant role in health and, in various parts of the region, is at risk due to land-use activities.

**(Goal E-4)**

**Goal E-3: Conserve and protect drinking water to meet the region's daily and long-term needs.**

**Sustainability Outcomes**

Ensuring access to basic water, sewer, and stormwater infrastructure would support regional economic growth as well as human health.

Conservation efforts continue to demonstrate the large amount of water that can be saved, ensuring adequate supply to meet the needs today, and tomorrow. Long-range planning and funding are essential so that major facilities are online when projected growth occurs.

**Goal E-4: Protect, preserve and restore streams, wetlands, and shorelines to protect water quality.**

**Sustainability Outcomes**

Maintaining high water quality in Puget Sound helps sustain the region’s aquaculture industries. Aquaculture is a major industry for many tribal and private-sector enterprises. Clean water and a healthy environment are positive attractors for new business.

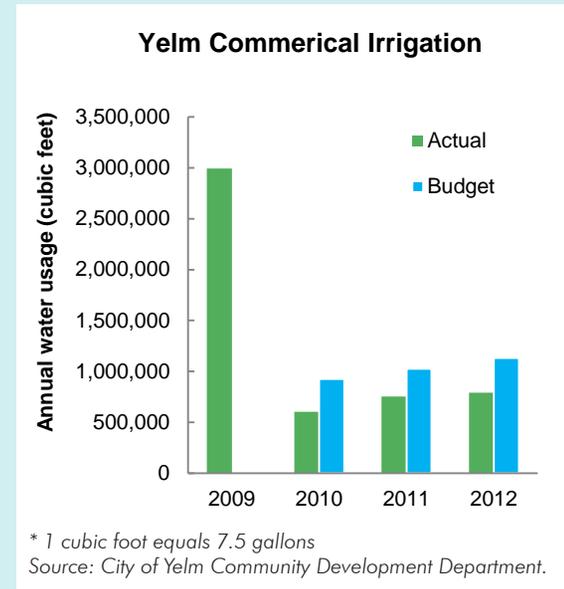
Restoration of impacted Puget Sound and stream shorelines is critical to salmon recovery.

## Sustainability Activities Already Underway Spotlight on Yelm: Water Efficiency

In April 2010, the Yelm City Council adopted a conservation program that established a water budget for businesses and homeowners' associations with an irrigation meter. The city based the 2010 irrigation budget on either the commercial customers' irrigation volume in 2009 or the Washington Irrigation Guide's recommendations for healthy and productive landscaping in Yelm. The goal was to cut in half the growing city's 2009 irrigation volume. They did it.

City officials read commercial customers' meters weekly during the irrigation season (mid-April thru mid-October) and provide notice of usage. A customer's irrigation meter is locked when the annual water budget is reached. Planting strips in the public right-of-way are irrigated with reclaimed water. The water budgets have made businesses and homeowner's associations more mindful that every drop counts — especially in Thurston County's fastest-growing city.

Citywide, Yelm's water use for commercial irrigation dropped by 80 percent between 2009 and 2010 — and it has been consistently 25-35 percent below the budget since the program started. The commercial landscape figures above do not include storm ponds and planter strips in the public right-of-way. Find more information on this and other water conservation efforts in the Case Studies of Water Efficiency in Thurston County, December, 2012: [www.trpc.org/regionalplanning/sustainability/Documents/Scenarios\\_indicators/WaterConservationCaseStudies\\_v2.pdf](http://www.trpc.org/regionalplanning/sustainability/Documents/Scenarios_indicators/WaterConservationCaseStudies_v2.pdf)



## Sustainability Activities Already Underway

### Guiding Growth – Healthy Watersheds: Translating Science into Local Policy

Protecting the Puget Sound, local streams, lakes, and groundwater will require new approaches and new partnerships. One example is a partnership between Thurston County, Thurston Regional Planning Council, the cities, Tribes, restoration partners, and state scientists. The project aims to identify management strategies that will:

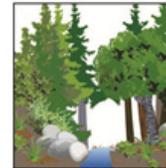
1. Protect any “Intact” or “Sensitive” stream basins from going to “Impacted” in the future.
2. Protect any “Impacted” stream basins from going to “Degraded” in the future. Improve and restore some basins from “Impacted” to “Sensitive” in the future.

Basins in the Totten/Eld and Budd/Deschutes watersheds were characterized based on current conditions, and assessed for future risk. The partners selected three basins for future study, including future scenario modeling. The results will inform a range of management strategies, including land-use and stormwater regulations, stormwater infrastructure investments, and restoration activities. What is learned from these basins will help inform comprehensive plan and stormwater manual updates.

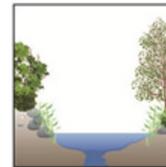
There are no easy answers or quick solutions. By taking a thoughtful, collaborative, and science-based approach with supportive technical tools, we will increase our chances of protecting and eventually restoring the health of the Thurston Region’s watersheds and the Puget Sound Basin.



*Intact and sensitive stream basins support a diversity of aquatic species and have good or excellent water quality. Upland basin-wide impervious cover is generally less than 10 percent, and forest cover is generally higher than 65 percent.*



*Impacted stream basins generally have fair water quality and support less diversity of aquatic species than intact and sensitive basins. Upland basin-wide impervious cover is generally between 10 and 25 percent, and forest cover is generally between 45 and 65 percent.*



*Degraded and highly degraded stream basins generally have poor water quality and support a low diversity of aquatic species. Upland basin-wide impervious cover is generally between over 25 percent and forest cover is generally less than 45 percent.*

The following table includes Environment goals and actions, as well as the timeline, lead, and partners for each action. Timeline definitions are as follows: Underway, Short (1-3 yrs); Medium (3-10 yrs); Long (10-20 yrs). See Appendix for lead and partner acronyms and explanations.

ENVIRONMENT				
Goals and Actions		Timeline	Lead	Partners
<b>GOAL E-1</b>	<b>Reduce air pollution that endangers human health.</b>			
Action E-1.1	Consider effect of land use decisions on air quality. Reduce the region’s vehicle miles traveled by focusing more job and housing density where there is access to services as well as safe and viable choices for travel.	Short; Medium; Long	Cities/towns; TRPC; County	ORCAA; IT
Action E-1.2	Focus on education about the opportunities and choices to be made regionally, locally and by households to reduce air pollution.	Short; Medium; Long	Cities/towns; TRPC; County	TCHHS; Nonprofits; IT
Action E-1.3	Continue to monitor air quality and take actions to reduce air pollution.	Underway	TRPC	All
<b>GOAL E-2</b>	<b>Reduce the region’s carbon footprint and protect critical infrastructure in case of extreme weather or sea level rise.</b>			
Action E-2.1	Develop a climate action plan (greenhouse gas emission reduction and mitigation). This will serve as a framework for how this region can reduce its climate impacts, while accommodating projected growth, and how it might best respond to the impacts of climate change on infrastructure, water supplies, risk reduction and emergency management, food systems, energy, community cohesion, and the economy. [Also Action L-2.1]	Short; Medium	TRPC	TCAT; IT; TE; PSE; County; Cities/towns
Action E-2.2	Establish regionally-consistent methodologies for evaluating climate-induced environmental impacts, assessing and prioritizing vulnerabilities, and understanding the sources of regional greenhouse gas emissions.	Short; Medium	TRPC	TCAT; TE; PSE; County; Cities/towns
Action E-2.3	Develop a greenhouse gas emissions framework for integrating emissions of heat-trapping gases analysis into transportation decision-making for those factors under the control of local government.	Short; Medium	TRPC	TCAT; TE; PSE; County; Cities/towns

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Goals and Actions	Timeline	Lead	Partners
<p><b>Action E-2.4</b></p> <p>Look for ways to incorporate greenhouse gas emissions calculations into traffic impact analyses to identify those land use proposals that will have a higher-than-average per capita impact on the region.</p>	Short; Medium	County; Cities/towns; TRPC	TCAT; TE; PSE
<p><b>Action E-2.5</b></p> <p>Use social marketing and other tools to educate and encourage behavior changes that reduce energy use.</p>	Short	County; Cities/towns; TRPC	TE; IT; PSE; Nonprofits
<p><b>Action E-2.6</b></p> <p>Develop public/private partnerships to evaluate and use alternative energy sources in order to offer opportunities for energy use reduction.</p>	Short; Medium; Long	Cities/towns; County; State	TCAT; TE; PSE
<p><b>Action E-2.7</b></p> <p>Ensure urban forestry plans are in place to promote and accommodate trees in appropriate ways throughout urban and suburban areas.</p> <p>The canopy will help easing heat sinks caused by hot sun on pavement and absorb carbon dioxide — the main heat-trapping gas that contributes to global climate change. Consider off-site mitigation and fee in-lieu programs for tree preservation, especially in redevelopment and infill areas.</p>	Short; Medium	Cities/towns; County	State
<p><b>Action E-2.8</b></p> <p>Offer incentives to keep and grow native trees.</p> <p>One example could be to create a tree exchange program (volunteers would grow native seedlings and offer pick-up/delivery, as well as detailed planting instructions).</p>	Short	Cities/towns; County	State; Nonprofits

ENVIRONMENT				
Goals and Actions		Timeline	Lead	Partners
<b>GOAL E-3</b>	<b>Conserve and protect drinking water to meet the region’s daily and long-term needs.</b>			
<b>Action E-3.1</b>	Update local land-use regulations for wellhead protection areas and standards for aquifer recharge protection areas, and coordinate with affected state departments and stakeholders. This entails adopting consistent critical area regulations for wellhead-protection areas and aquifer-recharge areas that are consistent and based in best available science across the region.	Short; Medium	Cities/towns; County	State
<b>Action E-3.2</b>	Institute or continue with aggressive water-conservation measures that stretch existing drinking water supplies. May include incentives such as rebates or free fixtures for the following: high-efficiency toilets for commercial as well as single and multifamily residential high-efficiency toilets; composting toilets; water-efficient washing machines; weather-based irrigation controllers; commercial/residential irrigation system assessments; and, commercial and institutional WaterSmart retrofits. Public outreach may include banners, events and water conservation displays, as well as school education programs. Education efforts may include showing customer use patterns and pricing information for the different levels of water use. Include conservation-based rate structures in all jurisdictions. Cost effectiveness thresholds for different measures and for different cities will need to be considered.	Underway	Cities/towns; County; PUD; Utilities; LOTT	State
<b>Action E-3.3</b>	Identify a local entity to provide technical assistance to private well owners regarding water conservation and leakage detection.	Short	County	State
<b>Action 3.4</b>	Amend codes to allow rainwater harvesting for non-potable and irrigation uses. Encourage the State Department of Ecology to allow greater water reuse without violating water rights issues. For example, allow subdivisions to collect rainwater to provide for landscape irrigation.	Medium	State; County; Cities/towns	

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Goals and Actions	Timeline	Lead	Partners	
<p><b>Action E-3.5</b></p>	<p>Change state water law to limit groundwater withdrawals from new exempt wells. This could entail the following: working with local legislators, affected state departments, and partners to change state water law; crafting legislation that allows local governments to adopt development regulations that restrict or limit groundwater withdrawals by exempt wells within a specific basin; developing water-restriction areas, which could include total or partially closed basins, locations with an imminent closure (either total or partial), or basins where an aquifer recharge study shows that an area has insufficient water supply to support a greater level of withdrawals. Considering the unintended consequences to residential food production, agriculture, and stock watering.</p>	<p>Medium; Long</p>	<p>County; Cities/towns; TRPC</p>	<p>State</p>
<p><b>Action E-3.6</b></p>	<p>Change state water law or adopt common local land-use regulations that prohibit individual exempt wells within Urban Growth Areas (UGAs) when municipalities or private suppliers can provide drinking water.</p>	<p>Medium; Long</p>	<p>County; Cities/towns; TRPC</p>	<p>State</p>
<p><b>Action E-3.7</b></p>	<p>Implement ground water banking. Thurston County could take a leadership role in allowing farming communities to share and swap water rights by working with local Nonprofits to create systems that protect water access for both fishing and agriculture by acquiring and managing water rights. This could be funded through a water district levee authority and impact fees.</p>	<p>Medium; Long</p>	<p>County</p>	<p>Nonprofits</p>
<p><b>Action E-3.8</b></p>	<p>Continue to rely on Thurston County Public Health and Social Service’s Hazardous Waste Division and Education and Outreach Programs to coordinate efforts to reduce the use of all household and garden chemicals.</p>	<p>Underway</p>	<p>County</p>	
<p><b>Action E-3.9</b></p>	<p>Support Thurston County’s Integrated Pest and Vegetation Management program and website as a cost-effective means of providing pest- and vegetation-control alternatives for home owners and land managers.</p>	<p>Underway</p>	<p>County</p>	

# ENVIRONMENT

Goals and Actions	Timeline	Lead	Partners	
<b>GOAL E-4</b>	<b>Protect, preserve and restore streams, wetlands, and shorelines to protect water quality.</b>			
Action E-4.1	Enforce existing environmental-protection regulations.	Underway	Cities/towns; County; State	Federal
Action E-4.2	Adopt new development regulations to require the use of low-impact development (LID) practices where feasible.	Short	Cities/towns; County	State
Action E-4.3	Continue to support local efforts to identify and restore degraded streams and shorelines of Puget Sound. Target properties identified in local and regional restoration plans, and fund these actions through a combination of local, state, and federal resources. Establish a target date for removal or remediation of all problem culverts.	Underway	Lead entity	Tribes; County; Cities/towns; Nonprofits
Action E-4.4	Conduct stormwater retrofit studies for all Thurston County basins and establish funding to retrofit existing development to improve stream flows and water quality.	Short; Medium; Long	County; Cities/towns	TRPC
Action E-4.5	Continue to support the property acquisitions by the Capitol Land Trust and the Nisqually Land Trust of high-quality habitat lands. This could entail purchasing the habitat lands or acquiring an easement on part of the property; fund these actions through a combination of local, state, and federal resources.	Underway	Land trusts	
Action E-4.6	Update the wetlands inventory for the Thurston Region. Focus the mapping effort on parts of the county where local government has land-use control (about 615 square miles); make steady progress on an annual basis, and establishing a target date for project completion.	Medium; Long	TRPC; County	Tribes; Cities/towns; Nonprofits

# ENVIRONMENT

Goals and Actions	Timeline	Lead	Partners
<p><b>Action E-4.7</b></p> <p>Continue to support a comprehensive stream-mapping effort throughout Thurston County.</p> <p>Use the mapping protocol established by the Wild Fish Conservancy to create detailed stream maps countywide; focus the mapping effort on parts of the county where local government has land-use control (about 615 square miles); allow local jurisdictions to use best available science for site-by-site review, including LIDAR (Light Detection and Ranging) –technology based topography, as an alternative to the inaccurate WDNR stream layer until the stream remapping is complete; and, make steady progress on an annual basis, and establishing a target date for project completion.</p>	Underway	Nonprofits	Tribes; Cities/towns; County
<p><b>Action E-4.8</b></p> <p>Purchase development rights for high-quality stream basins.</p> <p>Do this by: identifying stream basins in the rural area where development rights would be purchased to preserve a healthy stream. Sources to finance actions could include using local conservation futures funds or a local funding source for restoration.</p>	Medium	County	Nonprofits; Land trusts
<p><b>Action E-4.9</b></p> <p>Identify high-quality stream basins and adopt special development regulations to protect water quality.</p> <p>Regulations could include mandatory clustering for new subdivisions with a mandatory tree tract, minimum canopy cover standards, or limit for impervious areas.</p>	Underway	County	Cities/towns; TRPC
<p><b>Action E-4.10</b></p> <p>Establish a goal of restoring a certain percentage of the riparian zone for each stream.</p> <p>Consider and evaluate a habitat restoration surcharge to stormwater utility rates to rehabilitate impacted stream and shoreline habitats. Expand incentives and requirements to restore riparian and shoreline areas as part of obtaining additional permits or building on properties.</p>	Short; Medium	County	Cities/towns
<p><b>Action E-4.11</b></p> <p>Identify interjurisdictional restoration projects based upon watershed restoration plans, project identification strategies, stormwater capital facilities plans, and other mitigation efforts.</p> <p>A local example is Olympia, Lacey, and Yelm’s joint water rights mitigation project on the Deschutes River near State Route 507, which is being funded by their water utility rates.</p>	Underway	Cities/towns; County; Tribes	
<p><b>Action E-4.12</b></p> <p>Identify and secure a consistent funding source to support long-term monitoring of ground and surface water quality in the region’s basins.</p>	Short	County; Cities/towns	State