

# Shoreline Climate Action Plan

September 2013



# Acknowledgements

## Shoreline City Council

**Keith McGlashan**, Mayor  
**Chris Eggen**, Deputy Mayor  
**Will Hall**  
**Doris McConnell**  
**Chris Roberts**  
**Jesse Salomon**  
**Shari Winstead**

## City Leadership Team

**Julie Underwood**, City Manager  
**Debbie Tarry**, Assistant City Manager  
**Dick Deal**, Parks, Recreation & Cultural Services Director  
**Dan Eernisse**, Economic Development Manager  
**Robert Hartwig**, Administrative Services Director  
**Shawn Ledford**, Chief of Police  
**Rachael Markle**, Planning and Community Development Director  
**Mark Relph**, Public Works Director  
**Ian Sievers**, City Attorney  
**Marci Wright**, Human Resources Director

## Shoreline Climate Action Plan Team

**Rika Cecil**, Environmental Programs Coordinator, Project Manager  
**Eric Bratton**, Management Analyst/PIO  
**Maureen Colaizzi**, Parks Planner  
**Miranda Redinger**, Senior Planner  
**Nora Smith**, Neighborhoods Coordinator  
**Rick Kirkwood**, Budget Analyst

## Special Thanks to City Staff from All Departments

**Brian Landau**, Surface Water & Environmental Services Manager  
**Kim Lehmborg**, Associate Planner  
**James McCrackin**, Pool Manager  
**Alicia McIntire**, Senior Planner, Transportation Division  
**Kate Skone**, Carbon Inventory Technician

## Contributing Organizations

CleanScapes  
Shoreline Farmers Market  
Shoreline Solar Project  
Northwest SEED  
PedNet Coalition, Inc.  
Puget Sound Solar

## Prepared for the City of Shoreline by

Cascadia Consulting Group

## Funding Generously Provided by

Washington State Coordinated Prevention Grant  
King County Waste Reduction and Recycling Grant

# Table of Contents

4	Letter from the Mayor
5	Executive Summary
13	Shoreline and Climate Change – Why it Matters
15	Climate Action Plan Introduction and Overview
17	2012 Greenhouse Gas Emissions Inventory and Reduction Goals
23	Energy and Water
41	Materials and Waste
53	Transportation, Land Use, and Mobility
69	Urban Trees, Parks, and Open Spaces
77	Conclusion
78	Glossary
79	Endnotes
82	References and Web Links
86	Appendix A: Shoreline Climate Action Objectives and Recommendations

# Letter from the Mayor

June 20, 2013

On behalf of the City Council, I am proud to introduce the City of Shoreline's Climate Action Plan. Shoreline residents, elected and appointed officials, and staff place a priority on sustainable land use and building practices, resilience of our natural systems, and reducing the City's carbon footprint.

Following direction from a 2007 Council goal to "create an environmentally sustainable community," staff worked with the community to develop an Environmental Sustainability Strategy, which was adopted in 2008. The City also built a new City Hall facility, completed in 2009, that achieved a Leadership in Energy and Environmental Design (LEED) Gold certification. By 2012, the City's interdepartmental Green Team, tasked with implementation of the Sustainability Strategy, had completed 42 of the 50 recommendations.

One of those recommendations was to "create baselines for all Sustainability Strategy focus areas and implement an indicator tracking system" to evaluate progress over time. In April 2012, the [forevergreen](#) webpage was launched. The page was organized into the five focus areas identified in the Sustainability Strategy: Climate Protection, Natural Habitat, Resource Conservation, Built Environment, and City Initiatives. It identifies 13 categories of performance measures and 43 indicators that will be tracked over time to quantify the progress of City initiatives.

With the launch of the webpage and substantial implementation of the Sustainability Strategy, the City has shifted its focus to supporting Shoreline residents and businesses with their decisions about sustainable actions. The City recognizes the importance of contributing to sustainability through public projects that connect trails and transit, encouraging commercial development that provides jobs and services to neighborhoods, and supporting innovative Low Impact Development stormwater and building practices. If the community is to make a significant difference in their impact on local and global systems, however, it will be because of individual, household, and business choices.

The focus of the City is also expanding to encompass economics and social equity in addition to environmental sustainability, as reflected in Council Goals, Vision 2029, and Framework Goals for the Comprehensive Plan Update and Light Rail Station Area planning.

To demonstrate this commitment toward broader sustainability, the City has signed the U.S. Conference of Mayor's Climate Protection Agreement, the Cascade Agenda, the Green City Partnerships Program, and the King County-Cities Climate Collaboration. This Climate Action Plan provides the City with the direction for how best to fulfill these obligations so that future generations will be able to enjoy the same natural beauty, clean air and water that we do today.

Sincerely,



Keith A. McGlashan  
Mayor



# Executive Summary

The City of Shoreline has a long-standing commitment to promote environmental sustainability in municipal operations and throughout the community as a whole. This Climate Action Plan (the Plan) represents the City's next step in upholding its commitment to chart a course that will reduce climate change-causing greenhouse gas (GHG) emissions in Shoreline.

As such, the Plan was developed to achieve the following three goals:

1. Communicate to the community **what the City has already done** and quantify the benefits of those actions.
2. Establish **specific GHG emission reduction targets** and **make recommendations for additional City actions** to help achieve them.
3. Inform the community about **what residents and businesses can do** to address climate change.

Ultimately, the Shoreline Climate Action Plan strives to provide a road map for residents, businesses, City officials, and staff to take important steps that will reduce GHG emissions in our local, regional, and global community.

The Plan is organized into four focus areas that encompass the major sources of GHG emissions and opportunities for emission reductions:

 **Energy and Water**





 **Materials and Waste**

 **Transportation, Land Use, and Mobility**

 **Urban Trees, Parks, and Open Spaces**

Across these four focus areas, eleven climate action objectives are established that apply to both municipal operations, as well as the City's role in community-based action on climate change.

## Shoreline Climate Action Objectives

	Objective 1. Reduce energy consumption Objective 2. Increase renewable energy production and use Objective 3. Reduce water consumption
	Objective 4. Increase recycling and reuse to reduce solid waste sent to the landfill Objective 5. Reduce GHG emissions embodied in materials and food consumed
	Objective 6. Reduce fossil fuel consumption by vehicles Objective 7. Reduce use of single occupancy vehicles Objective 8. Increase convenience and safety of alternative transportation Objective 9. Concentrate new growth in proximity of services and transit
	Objective 10. Prevent tree canopy loss and improve tree health Objective 11. Maintain and improve parks and open spaces

For each objective, the Plan describes what the City has already done, presents recommendations for further action the City can take, and highlights actions that Shoreline residents and businesses can take to reduce their own carbon footprint.

The following three sections provide a brief summary of how the Plan addresses each of these, as well as the recommended GHG emission targets.

### 1. What Shoreline is Doing

In its own **operations**, the City has already implemented many ambitious projects and practices that reduce GHG emissions and put the City on track to further reduce its climate impact. Examples include:

**City Hall.** The certified LEED Gold City Hall was completed in 2009 and features numerous climate-friendly elements, including a solar hot water system, photovoltaic panels, sensor-activated lighting, and high-efficiency toilets and faucets. In 2012, the City Hall was responsible for 33 percent fewer GHG emissions than a typical Northwest office building per square foot.

**Environmentally Preferable Purchasing (EPP) Guidelines.** In 2012, the City adopted EPP Guidelines that help reduce the environmental impacts of its purchases by providing information and options for City staff that make purchasing decisions. As part of the EPP Guidelines, the City also established a Green Fleet Program that incorporated sustainable purchases and practices into fleet acquisitions, operations, and maintenance activities. To-date, the City has introduced three hybrid vehicles to its fleet.

**Paperless Meetings.** The City Council has gone paperless for its meetings, saving trees and printing costs, and reducing waste.



Actions that promote emission reduction have also been included in several large **capital projects** undertaken by the City. Examples include:

**Aurora Corridor Project.** Improvements to the Aurora corridor included the planting of nearly 1,000 trees, use of Silva cells to protect tree roots and sidewalks, use of bioretention boxes to improve water quality, installation of public recycling stations, addition of sidewalks to promote pedestrian safety, and increased capacity for transit.

**Interurban Trail.** In 2008, the City completed the Interurban Trail, a 3.25-mile bicycle and pedestrian trail that serves as the “spine” of the City’s bicycle infrastructure, connecting commercial areas, neighborhoods, transit areas, and parks for easy biking and walking. The City will soon begin a project to expand the trail to connect with the Burke Gilman trail.

Many of Shoreline’s **policies and plans** also promote GHG emission reduction:

**Low-Impact Development.** Land use regulations require low-impact development techniques, protection of critical areas, and tree retention and replacement. Starting in 2013, a new City rebate program provides businesses and residents up to \$1,600 for installing a rain garden or other conservation landscaping on their property.



**Investment in Public Transit, Bicycle, and Pedestrian Infrastructure.** The City's Transportation Master Plan established an abundance of policies and strategies for reducing Shoreline's single occupancy vehicle (SOV) dependence.

**No Idle Zone.** The City has also proposed a "No Idle Zone" draft policy for vehicles at City facilities, and has utilized grant funds to enable idling reduction in emergency response and field vehicles through the installation of LED light bars.

City efforts go beyond municipal operations, capital projects, and policies by encouraging and **engaging residents and businesses** to adopt climate-friendly behavior. Examples of community engagement efforts include:

**Shoreline Walks.** This new community walking program encourages Shoreline adults to leave their car at home and explore their local community, stay healthy, meet new people, and feel safer and more confident as a pedestrian. The program organizes and leads free walks through neighborhoods, parks, and trails throughout the city.

**Community Recycling.** The City of Shoreline is a recognized leader in promoting recycling. In 2012 the City was named Public Agency Recycler of the Year by the Washington State Recycling Association for its community and municipal recycling work; and King County named it one of the Best Workplaces for Recycling.

**Home Energy Conservation.** Shoreline has helped residents save energy by promoting home energy audits and offering free high-efficiency LED bulbs at community events.



## 2. Greenhouse Gas Emission Reduction Targets and Recommendations for City Action

The City of Shoreline is committed to meeting the regional GHG emission targets developed through the King County-Cities Climate Collaboration, which include the following draft recommendations:

- **Reduce communitywide greenhouse gas emissions by at least 25% below 2007 levels by 2020, 50% by 2030, and 80% by 2050.**
- **Achieve zero net greenhouse gas emissions from government operations by 2030.**

Meeting the above emission targets will require additional reductions in greenhouse gas emissions in Shoreline than demonstrated to date. To meet the community emission goal, Shoreline needs to reduce its community greenhouse gases by 11,000 metric tons carbon dioxide equivalent (mtCO<sub>2</sub>e) on average each year. To achieve the government operations target of zero net emissions by 2030, the City must take bold action to reduce its major emission sources. The Shoreline Climate Action Plan serves as an important step towards realizing these ambitious goals.

The Plan includes 45 recommendations for actions the City can take to make progress toward these targets. Recommendations are designed to align with or complement existing guiding policy documents, such as the Environmental Sustainability Strategy (2008); Transportation Master Plan (2011); Parks, Recreation and Open Space Plan (2011); and Comprehensive Plan (2012), and to align with upcoming projects and opportunities to integrate potential climate impacts with other City priorities.

The following section highlights some of the upcoming opportunities that align with recommendations included in the Plan.

**Shoreline pool.** The Shoreline pool is the City's biggest user of energy per square foot. A report on how to make this valued community resource more efficient was prepared as part of this Plan, and will serve as the basis for future discussion of potential solutions to reduce the pool's greenhouse gas contribution.



**Light rail.** Two light rail stations will begin service in Shoreline in 2023. The City will spend the next several years working with adjacent neighborhoods, community and regional stakeholders, and Sound Transit and other partner organizations to maximize the benefits of regional investment in this local amenity. Good planning for areas surrounding future light rail stations could improve housing choice, employment, walkability and connectivity, sense of community and place, health, and quality of life. Creating transit-oriented communities in these areas could also provide climate benefits in the form of reduced emissions from automobiles, and protect regional resource and agricultural lands by focusing development in areas that will have transportation and utility infrastructure in place.

**NE 145 Street.** Residents, staff, and leaders are aware of the multitude of safety, congestion, and hydrologic issues related to NE 145 Street, which is the southern boundary of Shoreline. Currently the eastbound lane is within the jurisdiction of the City of Seattle, the westbound lane belongs to King County, and the entire roadway is classified as a State Route. Local leaders and staff continue to engage in discussions with representatives of these organizations regarding potential annexation. The siting of a light rail station along this arterial could provide additional impetus for ownership and improvements, such as the measures implemented on Aurora Avenue to manage stormwater and traffic, and improve safety and walkability.



**Water Utility and Energy Districts.** Shoreline residents voted in 2012 for the City to undertake further study of the potential acquisition of the Seattle Public Utilities water infrastructure and service within the city. This Plan contains general recommendations about how the City, as utility provider, could encourage conservation and reuse, and even design infrastructure that could generate power or heat in utility operations.

**Community Renewal Area and Commercial Redevelopment.** Another potential opportunity for district energy is within large redevelopments, such as the designated Community Renewal Area of Aurora Square. Redevelopment of commercial and mixed-use areas in Town Center and near light rail stations could also provide opportunities for innovative systems for heating, cooling, power generation, and other emerging building science, water, energy, and even agricultural technologies.



**Partnerships with Community Groups and Local Environmental Organizations.** Shoreline is home to many passionate and well-informed environmental advocates and organizations. Groups host events and festivals, advocate for local and regional policies, and increase awareness and grass-roots momentum. This Plan provides recommendations for how the City and community groups could expand their current partnerships and communication to reduce greenhouse gas emissions and protect our climate.

### 3. What You Can Do – Community Actions That Matter

Every member of the Shoreline community has a role to play in addressing climate change. Although individual actions may seem small, they can add up to a big difference.

The Climate Action Plan presents more than 25 actions that Shoreline residents can take to reduce their own carbon footprint. All of these actions support the City’s climate action objectives, but some actions deliver larger emission reductions and are especially impactful.

In 2011, King County worked with the Stockholm Environmental Institute (SEI-US) to identify the individual household behaviors that have the biggest impact on the climate and that offer the greatest potential for emission reductions.<sup>1</sup> Here are the top seven areas that offer the greatest potential to reduce GHG emissions associated with household consumption in King County, and tips for what you can do to reduce your impact for each:



**The car you drive:** The average passenger vehicle consumes 535 gallons of gasoline each year.<sup>2</sup> Driving a more efficient vehicle helps your pocketbook and your carbon footprint. When you buy your next car, look for the one with the best fuel economy in its class. If you own more than one vehicle, use the most fuel-efficient one whenever possible.



**How you get around:** The use of vehicles for transportation is the #1 source of emissions in Shoreline, with transportation-associated emissions accounting for more than half of Shoreline’s communitywide carbon footprint.<sup>3</sup> Choose to use alternative modes of transport—such as public transit, bicycling, and walking—instead of personal vehicles whenever possible.



**Where you live:** Choosing alternative forms of transportation is easier when you live close to where you work, shop, and play. The next time you move, include proximity to your most frequent destinations in your decision. Reducing the distances travelled in your daily life can save you money and time, and reduce your climate impact.



**Home energy use:** Residential energy use is responsible for 31 percent of all GHG emissions in Shoreline. Start with a home energy audit to identify opportunities for savings. Simple and affordable measures, such as installing a programmable thermostat or sealing and insulating heating and cooling ducts, can reduce a typical family’s energy-related emissions by about 5 percent.<sup>4</sup>



**What you eat:** The United Nations Food and Agricultural Organization has estimated that almost 20 percent of global GHG emissions are from raising animals for meat and dairy production.<sup>5</sup> Eating a diet rich in fruits and vegetables and reducing your meat and dairy consumption could reduce your climate impact, and improve your family's health.



**What you don't eat:** The average family of four in the United States tosses out more than \$1,600 a year in wasted food, about 25 percent of all food purchases.<sup>6</sup> Reduce your food waste by implementing shopping, meal planning, and food storage habits that help you buy what you need, and preserve and use what you buy.



**The products you buy and use:** Once a piece of clothing, furniture, or other household item is manufactured, the GHG emissions associated with its production are "embodied" in the product. Making the most of that product can help avoid the need for additional emissions to manufacture a replacement. When you can, try to repair or repurpose household items. When you're ready to part with an item, consider posting it online or donating it to a second-hand store.

# Shoreline and Climate Change – Why it Matters

In May of 2013, concentrations of carbon dioxide (CO<sub>2</sub>) as measured at Mauna Loa, Hawaii, reached average daily levels above 400 parts per million (ppm), a concentration that has not been measured on Earth for at least three million years.<sup>7</sup> These increasing concentrations of CO<sub>2</sub> and other greenhouse gases in the atmosphere, driven primarily by human activities, are creating changes in the Earth's climate. Global climate change threatens the communities, livelihoods, and ecosystems of Shoreline and throughout the Puget Sound region. Rising temperatures, sea levels, and acidifying oceans, as well as more extreme droughts and floods, will continue to introduce disturbance and instability to the ecosystems and the natural resources we need.

Scientists have already observed the following regional climate change impacts:

- **Rising temperatures.** In the Pacific Northwest, average annual temperatures rose 1.5°F over the last century. From 2000 to 2011, more than half of the 63 stream and river sites in King County exceeded the temperature standard for safe salmon habitat, threatening the quality and extent of available habitat for salmon.<sup>8</sup>
- **More extreme droughts, floods and storms.** Between 1962 and 2008, King County observed a strong downward trend in summertime river water volumes, with a simultaneous increase in late fall severe storms and floods.<sup>9</sup> These impacts could compromise stormwater drainage infrastructure that was designed using mid-20th century rainfall records and could reduce electricity production at hydropower facilities.<sup>10</sup>
- **Increasing sea level.** Between 1898 and 2008, sea levels in Seattle have risen at a rate of 0.68 feet per century, and recent years have shown that rate to be increasing.<sup>11</sup> Rising seas could inundate low-lying transportation networks, such as railways and highways, and increase erosion of unstable shoreline bluffs.
- **Acidifying oceans.** Early in 2012, Washington State classified the entire Puget Sound as “waters of concern” due to the threat that ocean acidification presents to local shellfish and fish resources.<sup>12</sup> In 2010, the National Oceanic and Air Administration (NOAA) scientists determined that ocean acidification had caused hatchery production at a Puget Sound shellfish farm to drop 60-80%.<sup>13</sup>

There is global consensus among climate scientists that without action to curb the growth of greenhouse gas emissions, climate change will continue and accelerate. The International Panel on Climate Change estimates that, in the absence of sharp emissions reductions, the resilience of many ecosystems is likely to be exceeded by the end of this century, threatening the existence of many animal species, and jeopardizing the health and well-being of human societies.<sup>14</sup> Even with aggressive action to reduce GHG emissions, scientists say some impacts are already “locked in,” leading to unavoidable changes in the local environment, such as sea level rise and continued decline in spring snowpack.

According to the best available science as outlined by the Intergovernmental Panel on Climate Change, and as committed to by many countries at the Cancun United Nations Framework Convention on Climate Change in 2010, average global temperatures should be limited to no more than 2 degrees Celsius (3.6 degrees Fahrenheit),<sup>15</sup> in order to avoid the most devastating impacts of climate change. Achieving this will require reducing global greenhouse gas emissions by roughly 80 percent by 2050.<sup>16</sup>

## Roles and Responsibilities for Climate Action

Climate change is a global challenge, requiring global action. Governments at all levels, from all regions of the world, play an important part in developing and implementing solutions.

Although they do not—and cannot—bear full responsibility for taking action to reduce GHG emissions, cities play a central role in climate change. Although the high population densities, industries, and infrastructure in cities can result in creating some of the most severe impacts of climate change, cities are also a source of solutions. The same people, industries, and activities that make cities and their residents vulnerable, also make them centers for innovation, strategic development, and action.<sup>17</sup>

If cities are to be successful in their efforts to reduce emissions, actions by individuals are critical:

- In addition to taking action to reduce the climate impacts of transportation and daily home energy and water use, individuals can make purchasing choices every day that affect energy use and GHG emissions far beyond the boundaries of their own community.
- As consumers, individuals can influence market forces, the climate and our natural environment by choosing what to buy and where. Although all products have an effect on our climate, products made from recycled materials reduce our need for natural resources and the associated greenhouse gases, while ensuring that the market for materials to recycle remains strong.
- As voters, individuals can influence government action at all levels through direct advocacy and at the ballot box.
- Individuals can also promote climate action by having discussions with their neighbors and families, joining or supporting organizations, and participating in local government and community projects.



Corporations and businesses have a major role to play as well, from developing innovative technologies and sustainable supply chains, to reducing their own resource consumption and climate impacts.

Policies, actions, and innovative solutions embraced by cities like Shoreline, their residents, and businesses are critical to meet the challenge of climate change. Steps taken today to save energy, reduce waste, and conserve natural resources will pay significant dividends for future generations in Shoreline, the Puget Sound region, and around the world.

# Climate Action Plan Introduction and Overview

## Building On a Commitment to Environmental Sustainability

Environmental sustainability has been a core value in Shoreline since the city's incorporation in 1995. The citizens of Shoreline tend to have a high level of understanding of environmental issues, as well as a history of advocating that the natural environment be protected whenever possible in land use and other decisions made by elected officials. Many local organizations actively support solar power generation, community gardens, habitat restoration, and other actions that promote community sustainability and reduce greenhouse gas emissions.

With the support and encouragement of this informed and proactive constituency, the City of Shoreline has become a regional and national leader in sustainability and climate protection, adopting bold policies and implementing numerous ambitious projects in recent years.

In 2008, following a City Council goal to “create an environmentally sustainable community,” Shoreline adopted an **Environmental Sustainability Strategy** that provides guiding principles, objectives, targets, and recommendations. An interdepartmental Green Team was created to develop and implement the strategy. By 2012, 42 of 50 recommendations (84%) had been initiated or completed. Some of these recommendations relate specifically to emissions of greenhouse gases and other factors that contribute to climate change, while others relate to air and surface water quality enhancement, biodiversity preservation, and environmental toxicity reduction, among other environmental goals.

In 2012, the City launched a sustainability website—**forevergreen**—to provide the community with data on 43 sustainability indicators, as well as basic information about City projects and potential household initiatives for improving Shoreline's sustainability performance.



As a signatory of the U.S. Conference of Mayors Climate Protection Agreement and a member of the King County-Cities Climate Collaboration, the City of Shoreline is also specifically committed to reducing greenhouse gas emissions from municipal operations and in the community at large.

Major investments, such as the building of the new LEED Gold certified City Hall facility, completed in 2009, have helped the City make progress toward reducing its own carbon footprint, however the City recognizes that more needs to be done to reduce greenhouse gas emissions in Shoreline.

Shoreline residents agree that more needs to be done. In a 2012 telephone survey of Shoreline residents, 71 percent agreed with the statement: “Climate change is real and requires us to make changes in our behavior now.”<sup>18</sup>

Responding to this call to action, the City undertook an update to its greenhouse gas emissions inventory and the development of a Climate Action Plan to further advance the City's commitment to GHG emissions reduction.

## Climate Action Plan Goals

Through the 2013 Shoreline Climate Action Plan, the City hopes to achieve the following three goals:

1. Communicate to the community **what the City has already done** and quantify the benefits of those actions.
2. Establish **specific GHG emissions reduction targets** and **make recommendations for additional City actions** to help achieve them.
3. Inform the community about **what residents and businesses can do** to address climate change.

Ultimately, the Shoreline Climate Action Plan strives to provide the important steps that City officials and staff, as well as Shoreline residents and businesses, can take to reduce GHG emissions and protect our abundant northwest environment, as part of the global effort to address climate change.

## Organization of the Plan

The Shoreline Climate Action Plan begins with a summary of findings from the 2012 GHG emissions inventory and recommended emission reduction targets.

The remainder of the Plan is organized into four main focus areas:

-  **Energy and Water**
-  **Materials and Waste**
-  **Transportation, Land Use, and Mobility**
-  **Urban Trees, Parks, and Open Spaces**

Each focus area chapter outlines the City's vision for climate action in that area, and presents specific objectives in support of that vision. For each objective, the plan includes:

- The progress the City has already made
- Recommendations for further City action
- Actions that Shoreline residents and businesses can take to reduce their own carbon footprint

For both recommended City actions and steps that individuals and businesses can take, the Climate Action Plan presents a range of actions from those that are easily accomplished and implemented, to bold and ambitious actions that will require substantial investment, commitment, and creativity to implement, but which will have a more significant impact on reducing emissions.



# 2012 GHG Emissions Inventory and Reduction Goals

Completing a citywide greenhouse gas inventory is a crucial component of building a climate action plan. By profiling Shoreline’s carbon footprint—measured through a greenhouse gas emissions inventory—the City can identify inefficiencies, set targets, and monitor success (Figure 1). This Climate Action Plan reflects the 2012 update of the City’s greenhouse gas inventory and progress made since the City conducted its initial baseline inventory in 2009.

**Figure 1. The Role of a Greenhouse Gas Inventory in Development and Execution of a Climate Action Plan**



Source: Adapted from the City of Pittsburgh 2005 Greenhouse Gas Inventory



## What's In, What's Out

As in the baseline 2009 inventory, the 2012 inventory quantified two primary emission sources: 1) emissions from Shoreline government operations, and 2) emissions from the Shoreline community, including its residents, businesses, and industries. Within these categories, emissions associated with energy used for transportation (gasoline and diesel fuel), buildings (electricity, oil, and natural gas), solid waste, and streetlights and signals were quantified.

Emissions were largely calculated using the International Council for Local Environmental Initiatives (ICLEI) Clean Air Climate Protection (CACP 2009) software. To ensure use of the most holistic and locally-relevant data for the inventory, other tools, such as the City of Seattle's carbon footprint calculator and US EPA's WARM model, were utilized as appropriate. All calculations were consistent with the Local Government Operations Protocol, a widely-accepted methodology that has been adopted by the California Air Resources Board, The Climate Registry, and ICLEI.

To calculate emissions from the City's various sources, an associated emission factor from each emissions source in Shoreline was identified. An emission factor represents the net emissions associated with one unit of activity. For example, the emission factor for electricity use in Shoreline in 2012 is 0.4 mtCO<sub>2</sub>e per MWh.<sup>19</sup> This emission factor, which is based on the calculated average emissions associated with electricity production and transmission in the Pacific Northwest region, is published by the US Environmental Protection Agency (EPA) and consistent with the protocols set forth ICLEI and The Climate Registry. To calculate emissions from electricity, the total energy use (~374,000 MWh) was multiplied by the emissions factor (0.4 mtCO<sub>2</sub>e per MWh) to arrive at total electricity emissions (~150,000 mtCO<sub>2</sub>e).

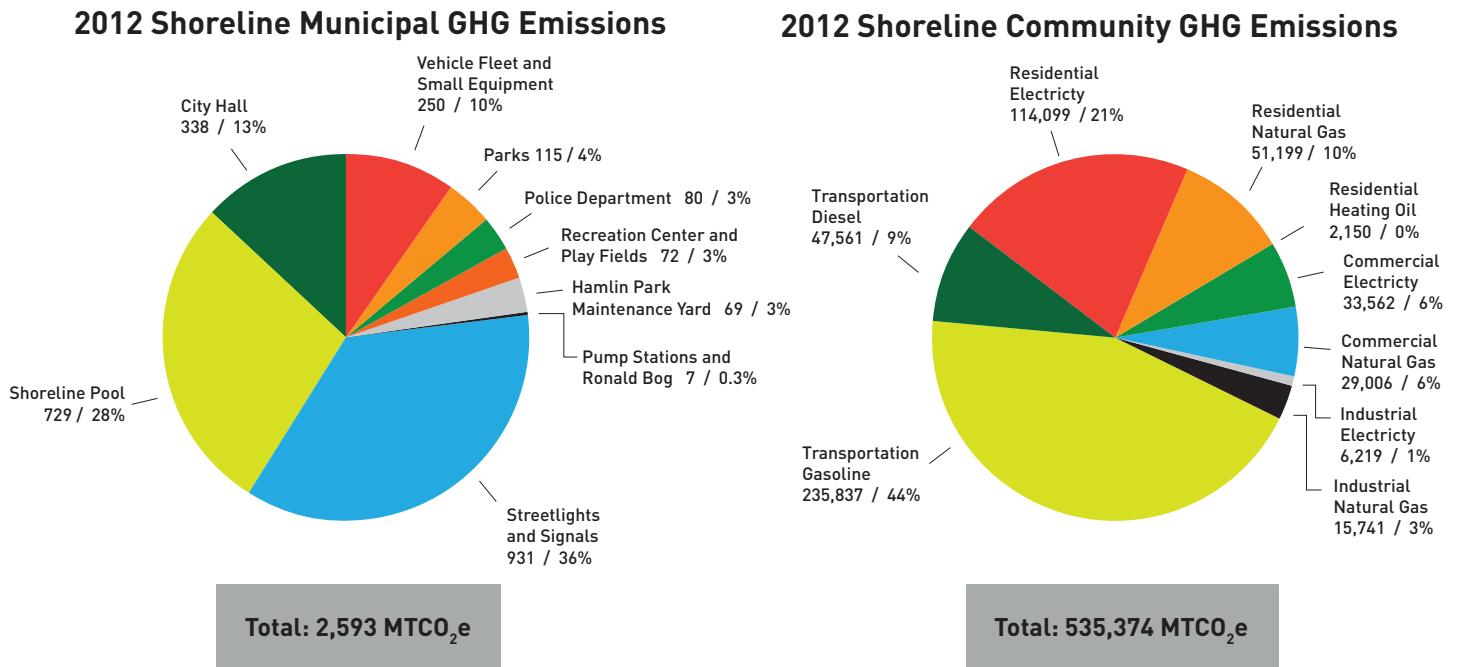
## How is Shoreline Doing?

Trends in Shoreline’s greenhouse gas emissions present a success story. Greenhouse gas emissions, measured in metric tons of carbon dioxide equivalent (mtCO<sub>2</sub>e), have declined since 2009 for both municipal operations and the Shoreline community (see Figure 2, Figure 3, and Figure 4). Emissions from municipal operations have decreased 8 percent—from 2,811 mtCO<sub>2</sub>e in 2009 to 2,593 mtCO<sub>2</sub>e in 2012. Much of this decline can be attributed to the conversion of 56 percent of streetlights in the city to LEDs. Emissions from the Shoreline community also declined—from 558,572 mtCO<sub>2</sub>e in 2009 to 535,374 mtCO<sub>2</sub>e in 2012. This 4 percent reduction is largely due to reductions in residential electricity use, and equates to taking 4,833 passenger vehicles off the road for a year!

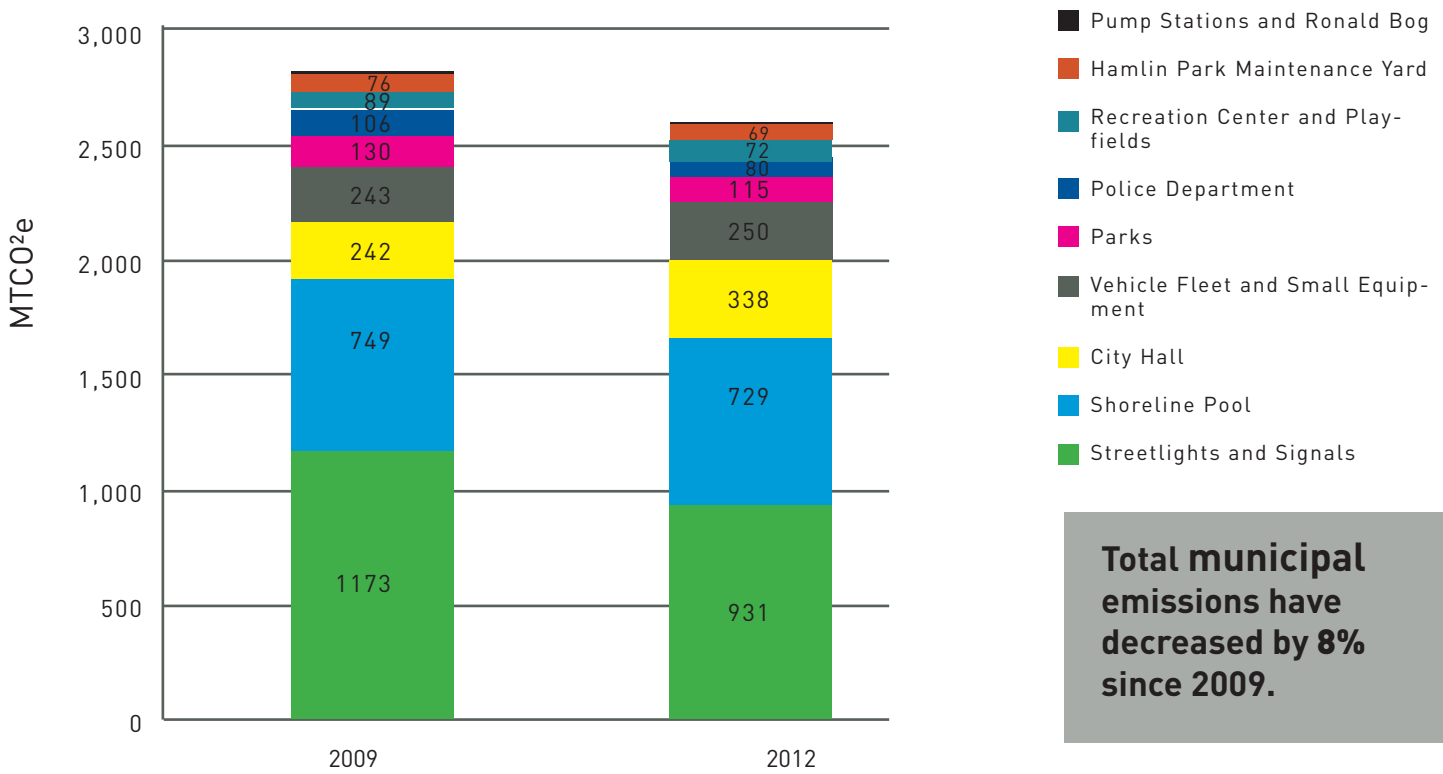
On average, each Shoreline resident emitted approximately 9.85 mtCO<sub>2</sub>e greenhouse gases in 2012. This amount represents a 7 percent decrease since 2009, when per-capita emissions totaled 10.63 mtCO<sub>2</sub>e per resident. The majority of Shoreline community emissions come from vehicle transportation and residential energy use, which account for 53 percent and 31 percent of total emissions, respectively.

The majority of the City’s 2012 municipal emissions originated from two sources: electricity to power the City’s streetlights (42 percent of total emissions) and natural gas to heat the City’s recreational swimming pool (21 percent of total emissions). With plans to convert the remainder of the City’s streetlights to LED and with a newly installed boiler at the pool, emissions from these two sources are expected to decline.

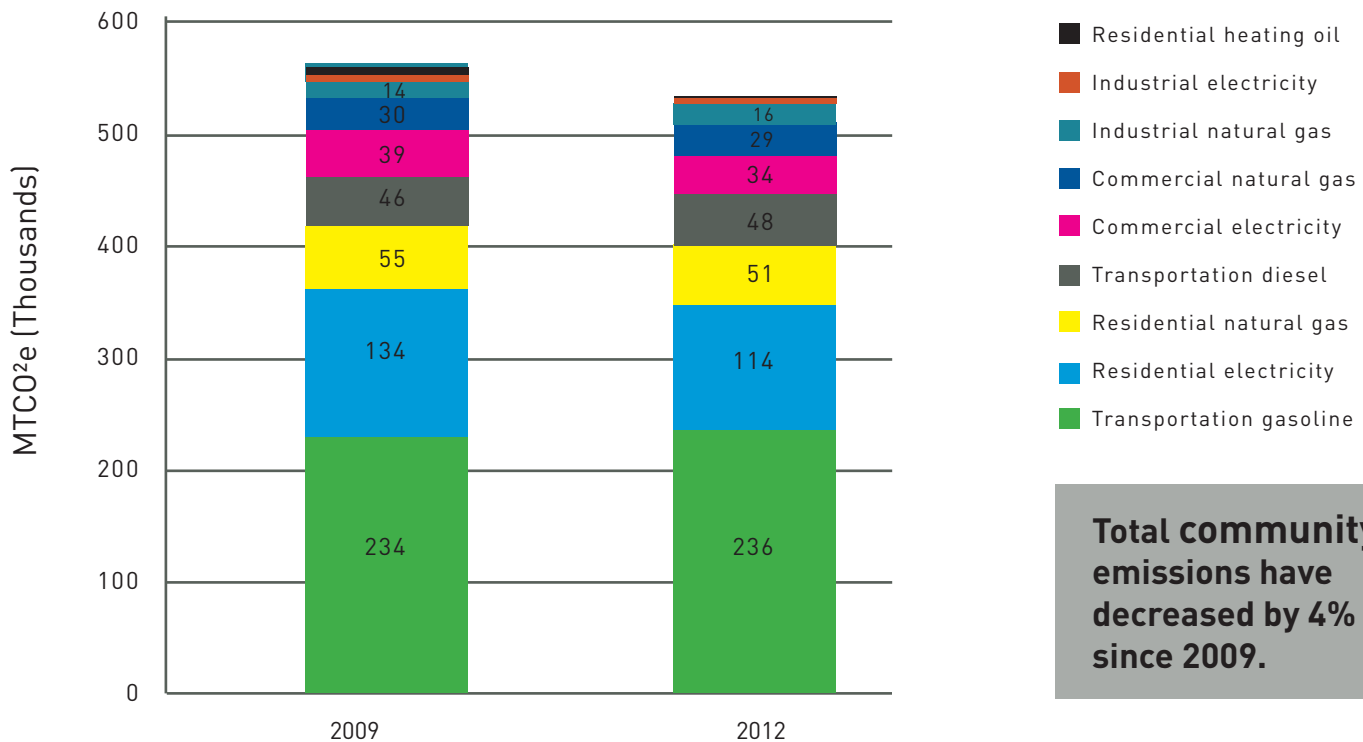
**Figure 2. Shoreline 2012 Greenhouse Gas Emissions Inventory Results**



**Figure 3. Trends in Shoreline Municipal Greenhouse Gas Emissions, 2009-2012**



**Figure 4. Trends in Shoreline Community Greenhouse Gas Emissions, 2009-2012**



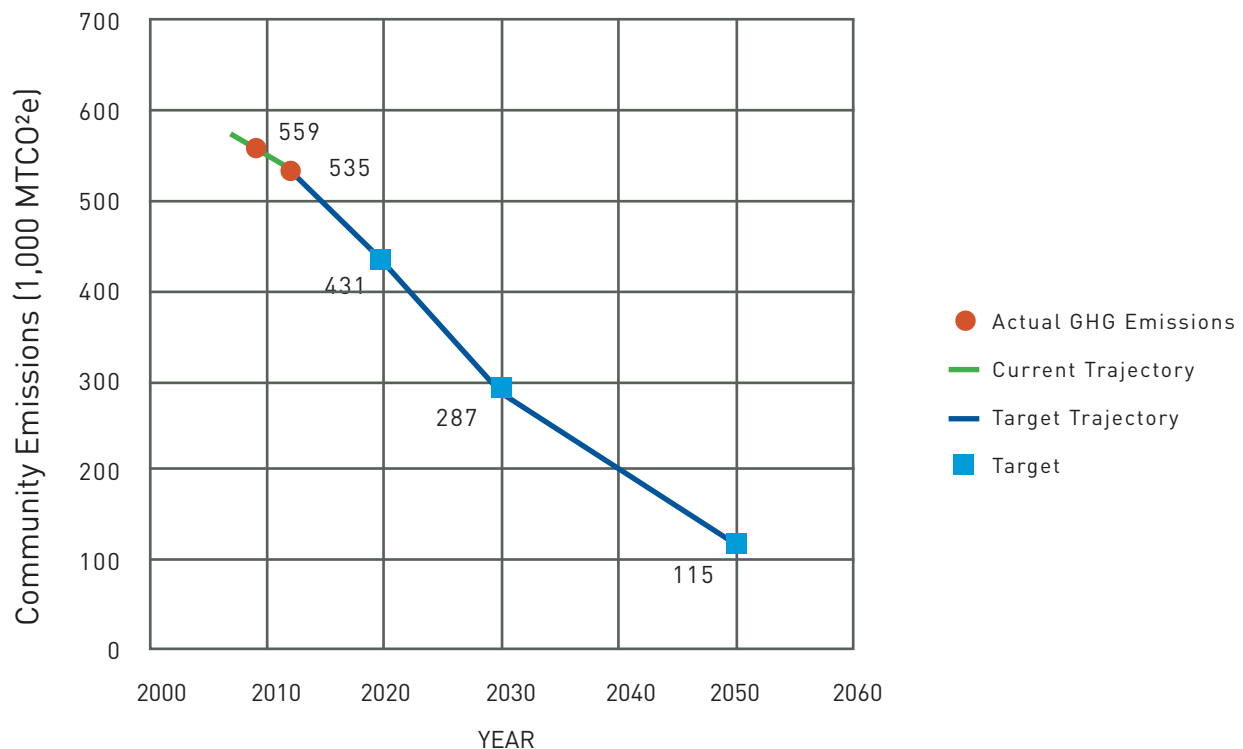
## What's Next

While Shoreline's reductions in community and municipal greenhouse gas emissions are commendable, work towards reducing the City's greenhouse gas emissions is not yet finished. As part of the King County-Cities Climate Collaboration, the City of Shoreline is committed to meeting the regional GHG emissions targets developed through the Collaboration, which include the following draft recommendations:

- **Reduce communitywide greenhouse gas emissions by at least 25% below 2007 levels by 2020, 50% by 2030, and 80% by 2050.**
- **Achieve zero net greenhouse gas emissions from government operations by 2030.**

Meeting the above emissions targets will require more reductions in greenhouse gas emissions in Shoreline than demonstrated to-date (see Figure 5). To meet the community emissions goal, Shoreline residents, businesses, school district, community college, and other community partners need to reduce greenhouse gases by an average of 11,000 mtCO<sub>2</sub>e each year. To achieve the City government operations target of zero net emissions by 2030, the City must take bold action to reduce its major emissions sources. The Shoreline Climate Action Plan serves as an important step towards realizing these ambitious goals.

**Figure 5. Shoreline Community Emission Targets and GHG Reduction Progress**



To account for anticipated population growth, the goals set forth by the King County-Cities Climate Collaboration can also be considered on a per-capita basis. In this case, the Collaboration recommends **reducing per-capita greenhouse gas emissions to approximately 5 mtCO<sub>2</sub>e by 2030 and 1.5 mtCO<sub>2</sub>e by 2050.**

Having already achieved a 7 percent decrease in per-capita emissions from 2009 to 2012, the City of Shoreline is making progress toward meeting the 2030 and 2050 per-capita emissions goals recommended by the King County-Cities Climate Collaboration. In order to maintain this trend, the City needs to continue to help residents and businesses find opportunities to further reduce the emissions associated with living and working in Shoreline.

## Understanding Greenhouse Gas Emissions: What You Can Do

Taking action to address climate change begins with understanding how choices you make affect the climate. Here are a few things you can do to learn about your climate impact:



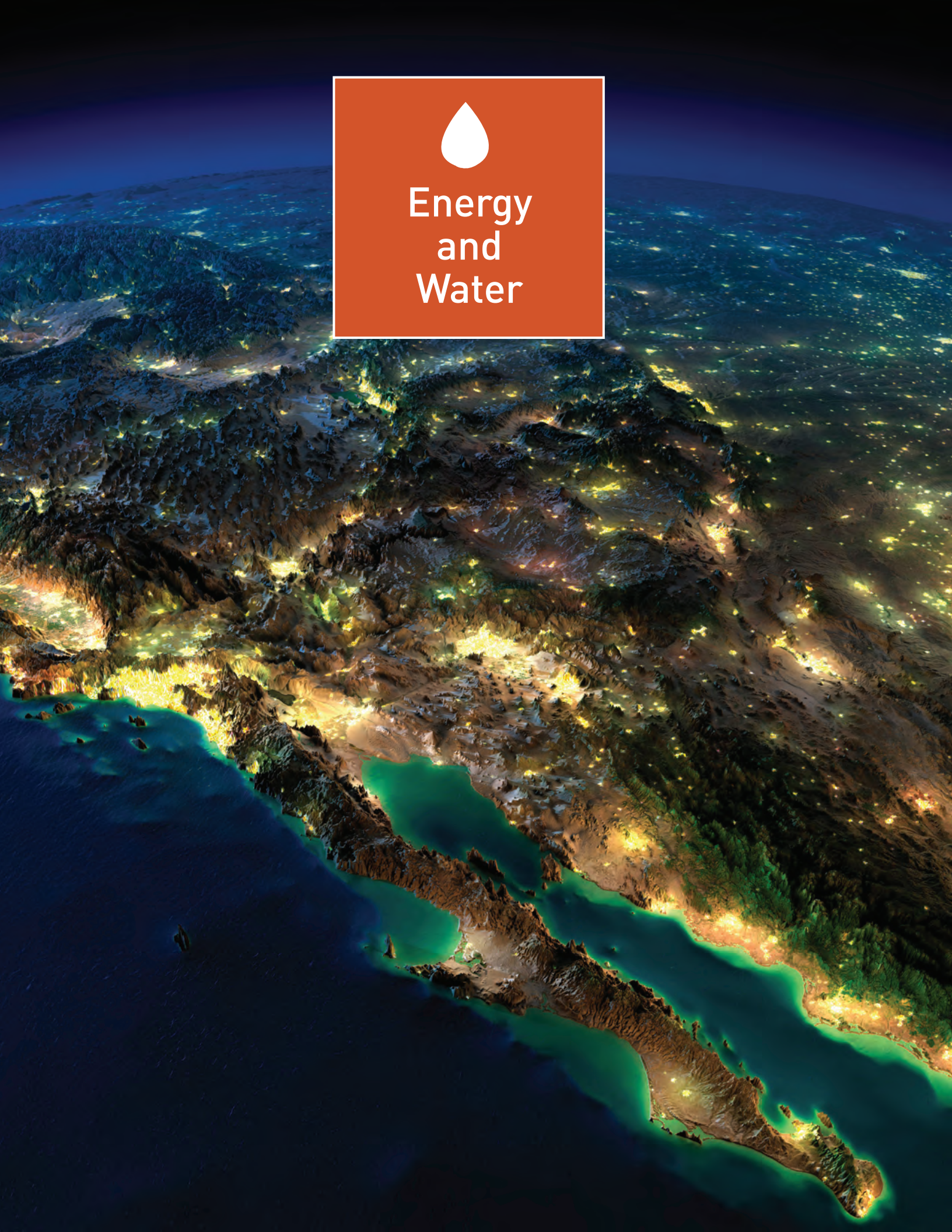
**Calculate your carbon footprint.** Answer a handful of questions about your travel, housing, food, and shopping habits, and the **Household Carbon Footprint Calculator**, developed by the CoolClimate Network, a project of UC Berkeley, will estimate your annual carbon footprint. The calculator also helps you build an action plan for reducing your footprint and estimates potential emission reductions and cost savings for a range of possible actions.



**Take the CoolerSmarter Pledge.** Get tips and practical ideas for reducing your footprint from the Union of Concerned Scientists at **CoolerSmarter.org**. Think small changes can't make a big impact? Explore the CoolerSmarter infographic that shows how individual actions can add up to big changes in energy use and GHG emission reductions.



Energy  
and  
Water





## Vision

The City’s Sustainability Strategy highlights energy solutions and resource conservation as key action areas for reducing the City’s carbon footprint and ensuring that future Shoreline residents will have the resources and means to live as well as, or better than, people today. By adopting behaviors, strategies, and efficient technologies that reduce water and energy use, the Shoreline community can enjoy a cleaner environment, more highly functioning facilities, and reduced risks to energy supply and price fluctuations, while contributing to climate protection for future generations.

## Challenge

Water and energy are intimately linked. The transport and heating of water for cleaning, irrigating, and drinking requires substantial energy inputs, and water-driven hydropower dams produce a significant amount of our region’s energy. Every turn of the thermostat, faucet, and light switch emits a specific and quantifiable amount of greenhouse gases. That amount depends on three primary factors: each person’s action, the region’s mix of energy-producing resources, and the efficiency of facilities and equipment used. Personal actions that reduce resource use also encourage a cleaner energy mix and increase equipment efficiency, which lowers the greenhouse gas emissions impacts from water and energy transport and use.

## Objectives

Shoreline has three overarching objectives that can reduce greenhouse gas emissions associated with energy and water use.

- OBJECTIVE 1. Reduce energy consumption.**
- OBJECTIVE 2. Increase renewable energy production and use.**
- OBJECTIVE 3. Reduce water consumption.**





# Reduce energy consumption

What Shoreline is doing to reduce energy consumption

## Municipal

### Shoreline's New City Hall Takes the Gold in Energy Efficiency

In 2009, the City moved to its new home: a super-efficient, LEED® Gold-certified City Hall. Built to high sustainability and green standards, the new City Hall boasts multiple innovative energy and water efficiency features, including a solar hot water system designed to reduce by 34% the electricity needed to produce hot water in the public areas on the first floor; low-flow sensor-activated toilet and faucet fixtures; and sensor-controlled lighting. Solar shades on the west and south facades keep the building cooler on sunny days, reducing cooling system energy use. A 3,050 square-foot green roof above the Council Chamber insulates the structure, improving comfort for everyone inside, and reducing heating and cooling energy use. With its climate and energy benefits, the City Hall creates enthusiasm for similar projects.

### Measuring Energy Performance of City Buildings

The City uses ENERGY STAR's Portfolio Manager, an interactive energy management tool that allows the City to track and assess energy and water consumption across the City's entire portfolio of buildings in a secure online environment. The tool helps the City set investment priorities, identify under-performing buildings, verify efficiency improvements, and receive formal recognition from LEED and ENERGY STAR for superior energy performance.

In 2012, the City Hall was responsible for 33 percent fewer emissions than a typical Northwest office building, and 10 percent fewer emissions than a typical ENERGY STAR office building, per square foot.



## Green IT

Desktop computers are an essential tool for Shoreline employees, but they can also be a major source of energy consumption at City Hall. To minimize the energy used by City computers, the City has implemented power saving settings, which power down monitors and hard drives after a period of no use. The City's IT department has also started replacing traditional desktops with virtual desktops, which, when fully implemented, will further reduce energy consumption.

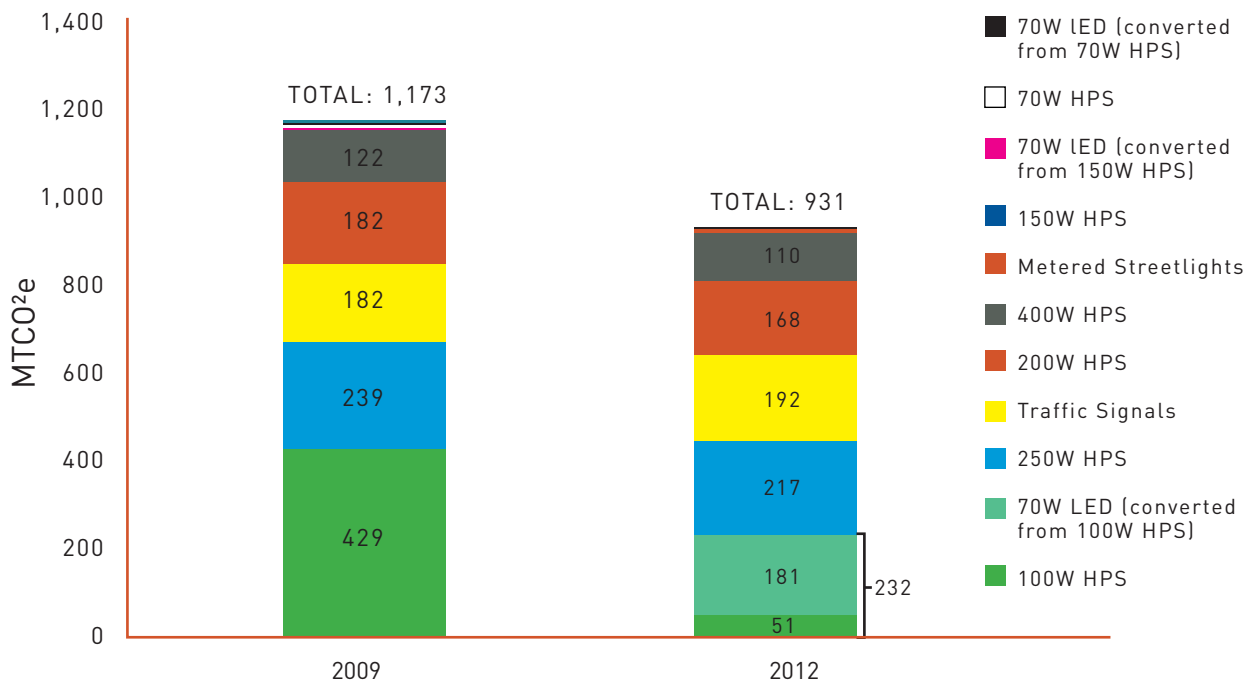
As government records and activities move into the digital realm, electronic datacenters have become another significant source of energy use for many cities. Server virtualization provides an opportunity to improve energy efficiency and cost savings in reduced staff time to maintain the servers. The City of Shoreline is in the process of migrating several of its datacenters from on-site servers to cloud-based servers. By 2014, approximately 70 percent of the City's data will be stored on virtual servers.

## Lighting the Way Toward an Efficient Shoreline

As the most significant single contributor to the City's municipal carbon footprint and energy costs, streetlights and signals present a compelling opportunity to lower City greenhouse gas emissions. In 2011, Seattle City Light converted 56 percent (more than 1,000 bulbs) of its residential streetlights in Shoreline to high efficiency light-emitting diode (LED) light bulbs. This replacement process, which reduced streetlight energy consumption by 48 percent (403,524 kWh), allowed Shoreline to reduce its energy costs and greenhouse gas emissions, while also helping Seattle City Light manage its load growth. Since LED streetlight bulbs cost less per month, the City saved approximately \$14,500 in 2012, as a result of the conversion.

**Installation of LED streetlights has cut the City's annual energy use by 12% and reduced net GHG emissions by 21%**

**Figure 6. Streetlights & Traffic Signals GHG Emissions**



## What Shoreline is doing to reduce energy consumption

### Community

#### Promoting Home Efficiency with SustainableWorks

In 2011, the City of Shoreline partnered with **SustainableWorks**, an energy efficiency non-profit general contractor, to encourage Shoreline residents to improve the energy efficiency of their homes. As part of the program, SustainableWorks offered homeowners low-cost home energy audits and financing assistance for upgrades.

The City provided meeting spaces and advertising for the program. Since the launch in 2011, SustainableWorks has provided energy audits to 337 homeowners and completed upgrades at 111 homes, resulting in estimated annual energy savings of 9,539 kWh. These energy savings translate into \$807 saved per participating household per year.<sup>20</sup>

#### Shoreline Green Business Program

The City has worked with the Chamber of Commerce on their Green Business Program, established in 2008, to assist Shoreline businesses to operate in an environmentally efficient manner, and to recognize and promote businesses that meet environmental compliance and conservation criteria. The program website showcases certified businesses and provides information and resources for businesses seeking to reduce waste, conserve resources, and use alternative modes of transportation.

The City also co-sponsored Green Business conferences, which provided practical information to local business owners on techniques to increase profits and reduce costs and environmental impacts on a day-to-day basis. The conferences, held in 2008 and 2011, covered a wide range of environmental topics, including pollution prevention, waste reduction, recycling, transportation, water conservation, energy efficiency, and marketing to a green economy.

### A Home Efficiency Success Story: Mary Hanson

While performing a \$95 energy audit, SustainableWorks found that Mary Hanson's Shoreline home was in desperate need of insulation and a new, more efficient furnace.

SustainableWorks worked with Mary to receive a no-interest loan for completing energy efficiency upgrades that require a payment of only \$50 a month.

One year after the upgrades, Mary's home energy bill has been reduced by over 80 percent, from \$233 a month in May 2010, to only \$50 a month in May 2011.



## Building Efficiency from the Ground Up

Although the City has not adopted a formal residential green building program to-date, the City of Shoreline is part of a regional code collaboration effort to share resources and build a consistent set of requirements to guide the development of new green building and development codes. In July of 2013, the Shoreline City Council approved development code amendments with higher standards for bicycle and electric vehicle parking; limits on exterior light pollution; and setback flexibility to allow for exterior insulation and rainwater catchment systems. The Council has also adopted amendments that allow alternative energy systems to exceed height limits.

New proposed building code amendments with higher standards for energy efficiency--as well as water, materials, and other green building elements--are being reviewed at the regional level and are expected to be presented to the Shoreline City Council for approval in 2014. This is part of an ongoing process to implement green building standards in Shoreline.

## Turning On the Savings with LED Light Bulbs at the Shoreline 2013 Earth Day Event

The City's annual Earth Day celebration attracts hundreds of Shoreline residents every year who want to try new eco-living tools and learn how to protect the climate and reduce pollution. In 2013, the City event awarded each attendee with an LED light bulb, which saves more energy and lasts far longer than incandescent or compact fluorescent bulbs. Participants were able to feel and see the power of LEDs in action. A hand-powered crank, which was connected to LED and incandescent bulbs, demonstrated the efficiency of this new and increasingly affordable technology. If used instead of a standard 60 watt incandescent bulb, each LED will save the resident more than \$65.00 in electricity costs over the life span of the bulb.<sup>21</sup>



## Recommendations for Further Action

### 1A Work with Seattle City Light to continue converting streetlights to LEDs.

In 2013, Seattle City Light completed the upgrade of 100 percent of Shoreline’s residential streetlights to more efficient, longer-lasting LEDs. Seattle City Light’s Ten Year Horizon Plan 2013-2022 anticipates that the remaining arterial streetlights will be replaced with LED lights during the 2014-2017 period, with conversion of all streetlights completed by 2022.

Because LEDs are 48-62 percent more efficient, last 3-4 times longer, and carry lower maintenance requirements, monthly charges for LED streetlights are 47-64 percent lower than their non-LED equivalents. Based on the 2013 rates, we estimate that upgrading the remaining non-LED streetlights to LED would reduce Shoreline’s costs for those lights by 55 percent, or \$125,000 annually (this amount is in addition to the \$14,500 saved in 2012 through the 2011 LED upgrades). An upgrade of all City streetlights to LED would reduce the City’s current estimated streetlight electricity consumption by more than half, saving 972,000 kWh annually. The City should work closely with Seattle City Light to support this effort and ensure that the remaining non-LED bulbs are replaced in an efficient and timely manner.

### 1B Make efficiency upgrades to Shoreline Pool facility to reduce energy use and lower operating costs as funding allows.

The Shoreline pool is the single largest facility contributor to the City’s carbon footprint, accounting for almost 30 percent of the City’s greenhouse gas emissions in 2012. Electricity and natural gas used to operate the pool costs the City more than \$100,000 per year. A recent energy audit of the pool identified a number of cost-effective energy conservation measures, including installation of a pool cover and night setback controls. Combined, these measures could save the City over \$50,000 in annual energy costs and reduce facility energy use by over 50 percent.



## Opportunities for Energy and Cost Saving at the Shoreline Pool

The Shoreline pool is a cornerstone of recreational services provided by the City of Shoreline to its residents, and it is highly used and valued by the community, with more than 124,000 visitors a year. Open seven days a week, the pool is also one of the largest sources of energy use in City operations, and the energy required to heat the pool and operate the facility accounted for nearly 30 percent the City's carbon footprint in 2012.

After conducting its baseline 2009 GHG emissions inventory, the City recognized that the energy used by the pool was a major source of municipal emissions, as well as a source of high operating costs. As a result, options were studied, in order to decrease the energy demands of operating the pool without sacrificing any service to the community.

As part of the development of the Climate Action Plan, the City worked with Rushing, a Seattle-based mechanical engineering, electrical engineering, and sustainability consulting firm, to complete an energy audit and analysis of opportunities for improving the pool's energy performance.

Although the analysis found that the Shoreline pool uses more energy-per-square foot than similar facilities in the region, it identified a number of cost-effective measures that would increase efficiency in facility operations and result in energy cost savings within a few years. The Shoreline Parks, Recreation & Cultural Services department is currently reviewing the report's findings and considering next steps for moving forward to enhance the energy efficiency of the pool, while ensuring that it remains a vital and reliable resource for Shoreline families.

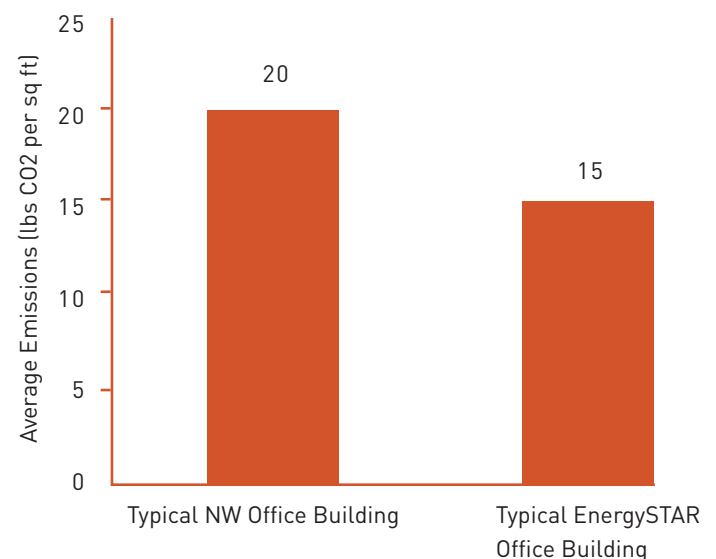
1C

### **Incorporate energy efficiency into upgrades of City facilities to meet ENERGY STAR building performance standards for similar building types.**

*(Modified from Environmental Sustainability Strategy (ESS) Rec-12)*

An ENERGY STAR-qualified building in the Pacific Northwest emits 25 percent less carbon than a typical office building.<sup>22</sup> Working to upgrade existing City facilities to meet ENERGY STAR performance standards would contribute to cutting facility greenhouse gas emissions, reducing energy costs, and building recognition for the City's climate action priorities.

**Figure 7. Average Annual Office Building Emissions**



1D

### **Incorporate energy efficiency best practices into new City buildings and consider seeking green building certifications such as LEED or ENERGY STAR for new construction projects.** *(Modified from ESS Rec-10)*

It is often easier and cheaper to install energy efficient features from the start than to retrofit energy systems after a facility is built. Incorporating efficient features, such as automatic lighting controls, high efficiency heating, ventilation, and air conditioning (HVAC) systems and lighting, or solar power generation, into new City buildings will save the City energy and money over the lifetime of the facility.



1E

**Expand the City’s Environmentally Preferable Purchasing Guidelines to include additional products that increase energy efficiency.** *(Modified from ESS Rec-13)*

The City’s current Environmentally Preferable Purchasing (EPP) Guidelines stipulate that the City consider the life-cycle costs and environmental impacts—including energy consumption—of purchased items. While the guidelines do provide a chapter on vehicle fleets, details and guidelines on electrical equipment and lighting are lacking. Adding sections to the EPP Guidelines that offer strategies for energy-efficient purchasing in these sectors will ensure that City energy priorities and initiatives penetrate across departments and activities.

1F

**Promote the use of Seattle City Light and Puget Sound Energy (PSE) incentives for energy conservation.** *(Modified from ESS Rec-17)*

Both utilities providing energy to Shoreline residents offer financial incentives to residential and business customers for energy conservation measures and practices. City staff could provide information to residents and businesses as part of on-going community outreach, on the City website, or to permit applicants during green building technical assistance meetings.



1G

**Promote high-performance building and energy efficiency in private construction and remodeling through education and code development.** *(Modified from ESS Rec-22)*

Encouraging enhanced energy performance in private construction can be challenging, as many of the building decisions are not within the City’s direct control. But the City can use educational materials, outreach, and code development tools to encourage green building. Shoreline City staff has already created brochures, and the City offers technical assistance on green building to homeowners, construction contractors, and developers. This educational effort could be expanded to include the exploration of incentives and potential mandates for elements of green or living buildings.



## What You Can Do

Residential and commercial electricity, natural gas, and heating oil use contribute to over 40 percent of the community's carbon footprint. Here are some quick and simple actions you can take to reduce your impact (and energy costs!).



### Lower the temperature on your hot water tank or on-demand hot water heater.

It takes more energy to keep your hot water heater at a high temperature than at a lower temperature. To reduce greenhouse gases, and to prevent the possibility of being burned by water at a high temperature, turn down the temperature. The U.S. Department of Energy recommends setting water to 120°F for most normal uses.



### Install a programmable thermostat, and program it to turn down or off when you're not at home.

According to the U.S. Energy Administration, about 42% of home energy costs go to heating and cooling. Heating and cooling unused spaces or while people are asleep wastes both energy and money. By turning your thermostat back 10° to 15° for 8 hours, you can save 5-15% a year on your heating bill – a savings of as much as 1% for each degree.



### When replacing appliances, purchase models that are highly rated by ENERGY STAR.

ENERGY STAR qualified appliances incorporate advanced technologies and use 10-50% less energy than standard appliances. From refrigerators to washing machines, ENERGY STAR qualified appliances save energy, save money, enhance performance, and reduce emissions of greenhouse gases and air pollutants. For a list of appliances, visit [www.energystar.gov](http://www.energystar.gov).



### Get an energy audit of your home or business and implement one recommendation each year.

A recent study conducted for King County found that retrofitting homes to consume less energy, both through improvements to the building envelope and upgrades in heating and air conditioning systems, can reduce household greenhouse gas emissions by 45 percent. SustainableWorks performs low-cost home energy audits in Shoreline – [sign up today](#).





## Increase renewable energy production and use

What Shoreline is doing to increase renewable energy

### Municipal

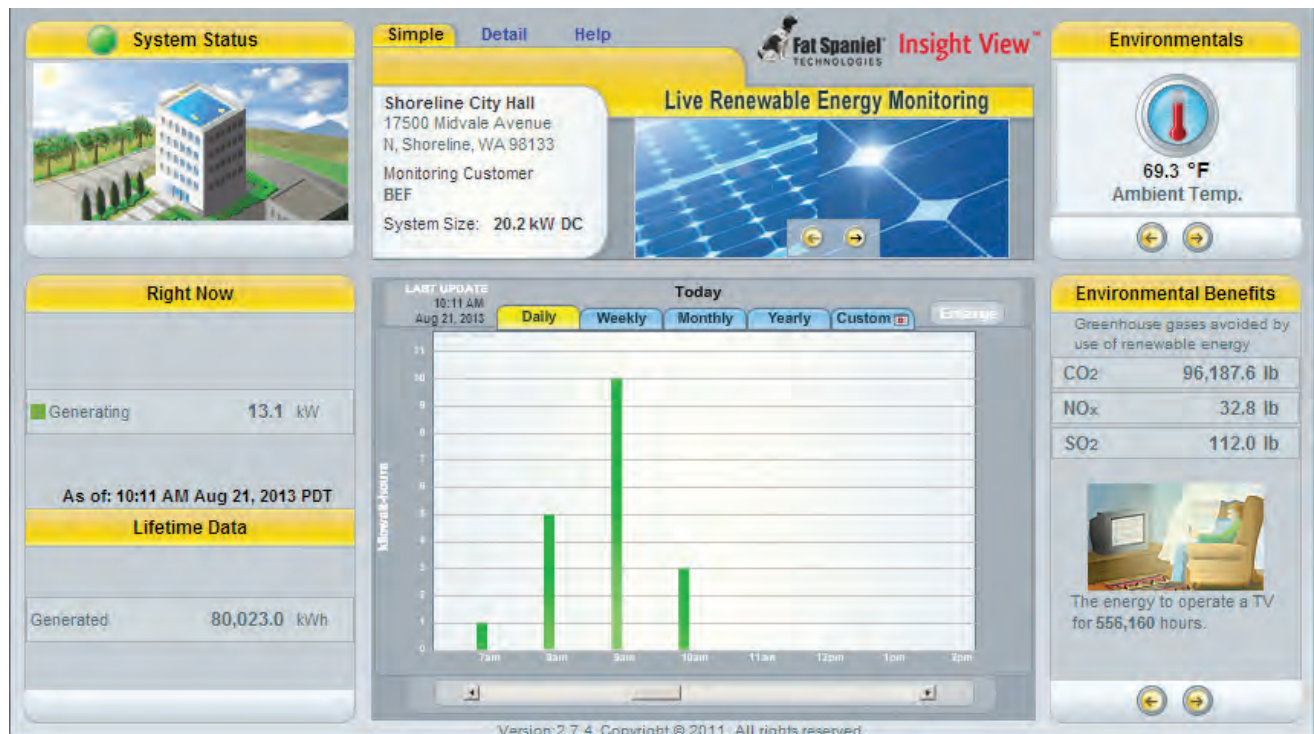
#### Harnessing Solar Power at City Hall

In March 2010, the City of Shoreline celebrated the installation of a 20kW solar project at the new City Hall. The project, which is the largest project supported by Seattle City Light's Green Power program,<sup>23</sup> consists of 117 solar photovoltaic modules installed on the parking garage to generate power for electric car charging stations and other uses.<sup>24</sup> Since its installation, the project has produced

over 73,000 kWh of electricity and avoided 46 mtCO<sub>2</sub>e greenhouse gas emissions, equivalent to the energy needed to power a home for 6 years. These savings are constantly tracked in real time and viewable to the public at the kiosk in the City Hall lobby and through an **online dashboard** (picture below), courtesy of Seattle City Light and Bonneville Environmental Foundation.

*"I commend the City of Shoreline for incorporating energy efficient design and equipment into its new City Hall as well as solar panels that will produce some of the electricity it uses. This building demonstrates how all of us can make sustainable energy choices."*

*– Seattle City Light  
Superintendent Jorge Carrasco*



## Green Up Power Purchases

In 2010, the City signed up to participate in Seattle City Light's Green Up program. This voluntary green power program allows customers to purchase green power for a portion of their electricity use and demonstrate their support for wind power and other new renewable energy projects in the Northwest. This investment in green power reduces reliance on fossil fuels, reduces greenhouse gas emissions, and improves air quality. Energy purchased through Green Up accounted for 35 percent of City Hall electricity usage in 2010 and 2011.



Photo courtesy of The Shoreline Solar Project

## Community

### Solar Fest

The Shoreline Solar Project, a local grassroots non-profit organization established in 2004, hosts an annual renewable energy and sustainable living fair called NW SolarFest. Located at the Shoreline Community College, the event features live music, speakers, workshops, electric car displays, energy efficient home tours, and over 100 exhibitors and vendors.



For the last 9 years the City has provided funding through the environmental mini-grant program to support SolarFest.

The Shoreline Solar Project also provides education and technical support to students of all ages. They helped students in the Shoreline Community College Clean Energy Technology program to develop renewable energy projects, such as "Henrietta," the solar water heater. They also provide solar demonstration at elementary school science fairs, and offer solar cooking classes with local girl scouts as part of the Science, Technology, Engineering, and Mathematics (STEM) educational program. For additional information, visit the [Shoreline Solar Project](#).



## Recommendations for Further Action

2A

### **Increase City green power purchases through Seattle City Light's Green Up program.** *(Modified from ESS Rec-14)*

Participation in the Green Up program has demonstrated Shoreline's commitment to clean energy and climate action. Currently the City purchases green power for 35% of the City Hall's electricity consumption.

**Green Up!**

Upgrading to the maximum Platinum level, which would require the City to purchase green power for 30 percent or more of its total citywide energy use, would boost Shoreline's recognition as a leader in

clean energy and lower the greenhouse gas emissions for all those who benefit from Seattle City Light electricity.

2B

### **Streamline permitting for solar photovoltaic (PV) installations.**

According to the Department of Energy, non-hardware costs associated with permitting and interconnection contribute as much as 40 percent to the total installed cost of a rooftop photovoltaic solar power system. Bringing down this cost through more streamlined, standardized, and consistent permitting processes could "tip the scales" for Shoreline residents and businesses, when a time-consuming and expensive permitting process is a key barrier to going solar. The Cities of Bellevue, Ellensburg, and Seattle are currently working to establish consistent standards and processes through their Evergreen State Solar Partnership effort.

2C

### **Through Environmental Services outreach and technical assistance, promote installation of renewable energy systems, and continue to support programs such as the Shoreline Solar Project.**

Identifying, designing, and installing renewable energy systems can be complicated, and many people lack the time or energy to fully understand the opportunities and benefits of renewable energy systems. Continued outreach and technical assistance, such as through events, informational brochures, and one-on-one support, can help bring down



SHORELINE SOLAR PROJECT

the barriers and fears of renewable energy adoption. The City of Mukilteo, for example, hosted free introductory solar workshops to boost interest in the Solarize Mukilteo

project. The City could partner with the Shoreline Solar Project—a demonstrated supporter of renewable energy within the Shoreline community—to organize events and conduct door-to-door outreach on energy opportunities for residents and businesses.



2D

## Explore the feasibility of launching a “Solarize Shoreline” bulk-purchasing program of solar PV systems in coordination with NW SEED.

Solarize Washington, a program of the nonprofit Northwest Sustainable Energy for Economic Development (Northwest SEED), is a local program that partners with City governments, neighborhood organizations, regional utilities, and local solar installation companies to help neighbors enjoy deep discounts through group purchasing of solar power systems. After a community signs up, Northwest SEED finds vendors who will give area homeowners a bulk discount on suppliers and installations. The partnership has already completed projects in Mukilteo, Stanwood/Camano, Queen Anne, Magnolia, the northeast Seattle Bryant-Ravenna neighborhood, and in northwest Seattle. Beginning a conversation with Solarize Washington on the possibility of a project in Shoreline would present a first step towards taking advantage of this innovative program.

2E

## Investigate the feasibility of development of district energy system(s) within the city.

A district energy system can provide heating, cooling, or hot water to multiple buildings through one central energy plant and distribution loop, eliminating the need for individual boiler systems. Pursuing district energy in Shoreline could bring many benefits, including increased energy efficiency, reduced greenhouse gas emissions, and more rapid adaptability to new technologies and fuel sources.<sup>25</sup> Consideration and integration of district energy and its components into future City infrastructure and urban planning projects would lay the groundwork for a more cost-efficient and seamless transition to this technology. When tearing up a road for repaving or building a new facility, the City could consider incorporating conveyance systems or connector technologies that will be required for district energy. For example, if the City annexes NE 145 Street and needs to make improvements with regard to the water utility and/or street design, integration of district energy should be considered.

In the town of West Union, Iowa, a new district energy system was built in conjunction with construction of its ‘complete streets’ plan. Seattle’s Preservation Green Lab compiled a primer for local governments on district energy called [The Role of District Energy in Greening Existing Neighborhoods](#) that emphasizes the benefits of district energy systems, addresses barriers to implementation, and provides a basic policy roadmap for district energy development. This primer could serve as a starting guide for exploring the possibility of district energy in Shoreline. Other resources include the Portland Sustainability Institute [toolkit](#) for organizing, financing, supporting, and assessing district energy systems.

Another opportunity to incorporate innovative energy systems within large multifamily projects is being explored in redevelopment of the Community Renewal Area at Aurora Square. New technologies that allow for capturing heat from on-site wastewater systems could provide up to 75% heating energy savings to residents. The City should consider upfront financing of such systems for multi-family and mixed-use projects of 200 units or more, with an agreement that tenants reimburse the cost over time.

The 2012 update to the Comprehensive Plan included a Speaker Series to provide information and spark discussion.

On April 30, Rob Bennett from the Portland Sustainability Institute described **EcoDistricts in the context of the Natural Environment** element.

On September 18, Matthew Kwatinetz discussed **Economic Development**.

Follow the links to view their presentations.



## What You Can Do

Using renewable energy can bring numerous benefits – and it may be easier than you think. Supporting renewable energy can insulate you from energy price fluctuations, make you a leader in your community, and help combat climate change. Here are some ways you can boost your use of renewable energy.



### Use solar-powered outdoor and landscape lighting.

There are many outdoor solar-powered lighting options for your yard and outdoor spaces. Unlike five years ago when solar was only used for path lighting, solar-powered fixtures are now available for most outdoor lighting categories. Next time you are considering installation of outdoor lighting, consider solar.



### If available, consider supporting the development of a community solar project.

Even if you are unable to install solar panels on your home or business, there are still ways for you to help your community “go solar.” Seattle City Light and Northwest SEED partnered to launch a community-based solar project in which customers enroll to support the development and maintenance of a 24-kilowatt solar system on the picnic shelters in Jefferson Park. Residential and business customers who enroll receive multiple benefits, including a 9-year credit on their power bills for electricity generated by the project. As a community solar supporter, you could help make it happen!



### Consider installing a renewable energy system on your home or business.

Don't let the price tag, uncertainty, or process of pursuing a solar or geothermal energy system in your home or business scare you. Residents and businesses across the Puget Sound region are taking advantage of federal tax credits, Seattle City Light's net metering, and Washington State's production incentives that are tipping the scales towards renewable energy. Begin exploring how renewable power could work for your property by perusing [Seattle City Light's Guide to Installing Solar Electric System](#), which covers everything from solar basics to contracting, permitting, and financial incentives.



## Reduce water consumption

### What Shoreline is doing to reduce water consumption

The conveyance, treatment, and heating of water require significant energy inputs. Efforts to reduce water consumption by the City of Shoreline and its residents can lower energy use, avoid emissions of harmful greenhouse gases, and reduce costs on energy and water bills.

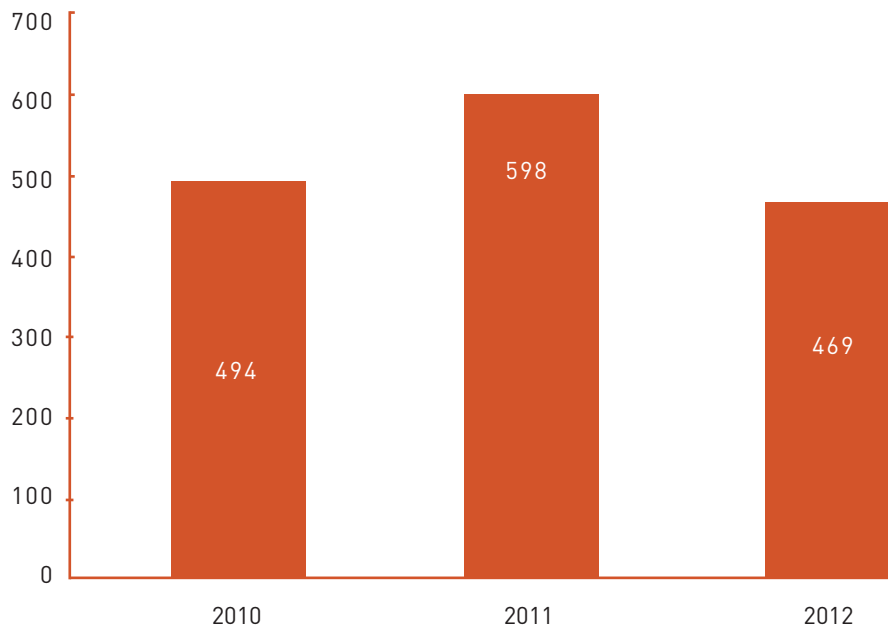
#### High Efficiency Irrigation

The City has been installing high efficiency irrigation controls in City parks and Public Works facilities for the last thirteen years. The entire Aurora corridor project has the Toro Sentinel System installed, which allows the City to program, control, and monitor multiple remote irrigation controllers from one location. This system increases water efficiency by allowing the City to easily and quickly monitor irrigation water use and turn it off during rain events. This efficiency is especially important for the Aurora corridor and right-of-ways, since irrigation at these locations comprised one third of the City's entire water use in 2012.

#### Water-Efficient Fixtures at City Hall

The new City Hall facility features low-flow, sensor-activated toilets and faucets with batteries that are recharged by the water flow. These high-efficiency fixtures have paid off. While overall City water consumption rose 35 percent from 2010 to 2012, water use at City Hall decreased by 5 percent. Higher water use in 2011 is largely attributed to lower levels of rainfall that year that resulted in the need to increase irrigation for the City Hall green roof and adjacent areas as new plantings were established.

**Figure 8. Shoreline City Hall Water Consumption, 2010-2012**



City Hall water consumption has decreased by 5% since 2010



## Recommendations for Further Action

3A

### **Assess potential replacement of fixtures and equipment in high-use operations in all City facilities with high-efficiency options.** *(Modified from ESS Rec-41)*

The installation of newer, more efficient toilets can reduce toilet water consumption by 20 to 60 percent.<sup>26</sup> In places where toilets are flushed frequently, such as park restrooms and recreational facilities, installation of more efficient fixtures could present a significant water savings opportunity. In addition to reduced annual water use and costs, the City could also benefit from available rebates and incentive programs. The Saving Water Partnership, for example, provides \$100 rebates for commercial high-efficiency toilets. A thorough assessment of potential water and cost savings could help the City identify top-candidate fixtures for replacement.

3B

### **Investigate the opportunities for rainwater harvesting and greywater reuse at existing and new City facilities and open spaces.** *(Modified from ESS Rec-43)*

Rainwater harvesting and on-site reuse of greywater (generated from domestic activities such as laundry, dishwashing, and bathing) provides multiple benefits, including reduced demand on city water, wastewater, and stormwater systems and infrastructure. Rainwater harvesting and greywater reuse can also contribute towards LEED certification of facilities. Installation of cisterns in public areas, such as community gardens, would provide a relatively inexpensive way for the City to begin incorporating water harvesting into its operations while also building public awareness. The City should also begin identifying and investigating rainwater harvesting and greywater reuse opportunities within City operations. Visiting local buildings that use these systems, such as Seattle City Hall and Central Library, and resources such as the Washington Department of Health's Greywater Reuse [website](#) are good starting points.

3C

### **Through the new water utility, consider rate structures or incentives for customers to encourage water conservation.**

As climate change reduces winter snowpack in the region, water conservation will become an increasingly critical element of water utility management and operations. Utility water conservation incentives such as rebates on water-efficient fixtures and conservation rate structures present a potential win-win opportunity for utilities and their customers. Conservation rate structures, such as inclining block rates (i.e. cost per unit of water increases with consumption) and seasonal rates, encourage efficient use and educate customers about the real costs of providing water. Rebates on water-efficient fixtures reduce costs for residents and businesses while also precluding the need for costly new facilities to accommodate increased water consumption. The new water utility of Shoreline should prioritize such conservation measures and incentives when designing its rates and programs.

3D

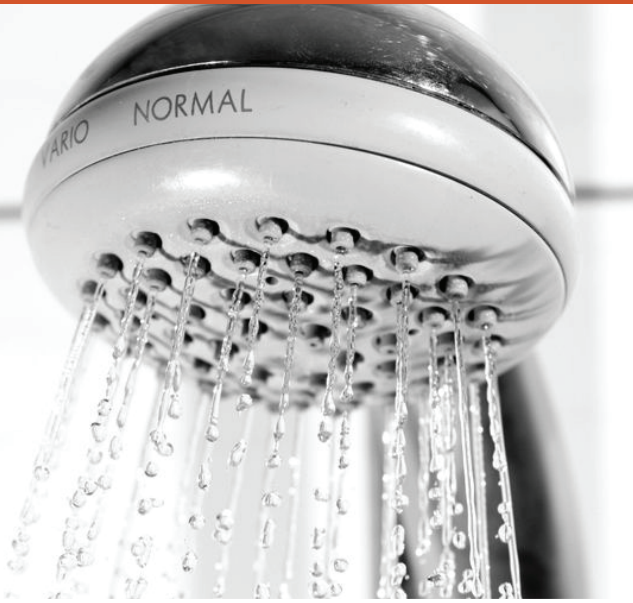
### **Promote water conservation through outreach and communications to Shoreline residents and businesses.**

Water efficiency education and outreach programs help water customers make better choices and improve practices to save on water bills and preserve water resources. Placing water efficiency tips into utility bill envelopes, offering specialized technical assistance, and collaborating with regional agencies, such as the Saving Water Partnership, can reinforce messaging and maximize public actions that support conservation.



## What You Can Do

Transporting and treating the water that flows into and out of your pipes requires a significant amount of energy, but much of that water isn't used. Simple behavior changes and fixture replacements can help you do more with less. The following are examples of what you can do to start saving water and reduce your environmental impact at your home or business.



Install high-efficiency showerheads, faucet aerators, and low-flow toilets to reduce water consumption.

If your showerhead, faucet, or toilet is more than five years old, chances are there are new, inexpensive fixtures or retrofits available that can reduce your water use by 30% to 60%. When upgrading your water-using fixtures or equipment, look for items that have the ENERGY STAR or WaterSense label. These labels are indicators that the product is resource-efficient and has met rigorous performance standards.

Reduce the water requirements of your yard by landscaping with native plants.

Native plants are adapted to our climate of wet winters and dry summers, and require less water and attention than non-natives.

Visit King County's [Native Plant Guide](#) to start integrating native plants, such as Beach strawberry, Red elderberry, and Big leaf maple into your yard or garden.







# Materials and Waste





## Vision

Shoreline is committed to creating an environmentally sustainable community that wastes less, recycles more, and enjoys resource-friendly products.

## Challenge

Each product has a greenhouse gas story. Every step in a product’s life cycle—from its manufacturing and distribution to its eventual disposal—releases greenhouse gases into our atmosphere. Since one ton of greenhouse gases released in Beijing creates the same impact as one ton released in Seattle, we are all responsible for emissions associated with the products we buy, use, and discard.

Landfills produce large amounts of methane, a powerful greenhouse gas, which is released when organic matter decomposes. By recycling and reducing the materials sent to our landfills, substantial amounts of methane are reduced, making it a valuable part of how we protect our climate. Waste prevention—through recycling, reuse, and reduction—can also create other benefits, such as lower rates for garbage collection, the conservation of open space, and economic benefits from the sale of recyclable materials. Buying recycled materials, repairing and reusing products, and buying less can significantly cut emissions and natural resources associated with mining, manufacturing, and transportation of materials.

## Objectives

Shoreline has two primary objectives for reducing climate impacts associated with materials and waste.

**OBJECTIVE 4. Increase recycling and reuse to reduce solid waste sent to the landfill.**

**OBJECTIVE 5. Reduce GHG emissions embodied in materials and food consumed.**



## Increase recycling and reuse to reduce solid waste sent to the landfill

What Shoreline is doing to reduce waste and increase recycling

### Municipal

#### Expanded Recycling and Composting Opportunities

The City now provides organics recycling at several municipal facilities, including the City Hall, the Richmond Highlands Community Center, Kruckeberg Botanic Gardens, and the community garden at Twin Ponds Park. In addition, all City-sponsored events at the City Hall are provided with plates, cups, and utensils that can be composted with the food scraps.

To support recycling in City parks and at bus stops, the City recently installed containers that compact waste and recyclables using solar power in five parks and high-use bus stops on Aurora Avenue. The City anticipates installing additional units for garbage and recycling at bus stops on Aurora Avenue, in the North City business district, and at Shoreline Community College.



#### Reduced Use

Shoreline's leadership has embraced a creative solution for reducing waste: members of the City Council and committees now use iPads in place of meeting packets to reduce paper use and printing costs. This switch has eliminated approximately 42,500 pages of printing—85 reams—annually, resulting in hundreds of dollars in costs savings each year and avoiding about half a metric ton of CO<sub>2</sub>e emissions.

### Community

#### Recycler of the Year

The Washington State Recycling Association named Shoreline the 2012 Public Agency Recycler of the Year. The award recognizes public agencies that effectively increase recycling and waste prevention, while being committed to providing environmental and economic benefits to their community.

The award was based in large part on the extensive City partnerships throughout the community



that increase recycling, such as at Shoreline libraries, where All Battery Sales & Service collaborates to collect and recycle household batteries for Shoreline residents. In 2013, the City was recognized by King County as a Best Workplace for Waste

Prevention and Recycling, demonstrating the City's commitment to exemplary actions that avoid the production of waste.

The City of Shoreline is working to help its residents and business save money and lower their carbon footprints by reducing waste generation and increasing diversion. Since 2001, the City has offered residents a variety of products that make composting easier, such as Green Cones and backyard composting bins for food scraps and yard waste composting, as well as kitchen food scraps collection buckets and compostable bags.

In 2008, Shoreline expanded recycling and organics collection throughout the city. Businesses received co-mingled recycling at no extra cost, and residents gained the opportunity to subscribe to food scraps and yard debris recycling.

Every year, the City hosts two RecycleFest events that allow residents to bring difficult-to-recycle items such as Styrofoam, plate glass, carpet, shingles and construction and demolition (C&D) debris to be recycled.



## Shoreline Multifamily Recycling Pilot Project

### WHAT

In 2011, the City teamed with CleanScapes to conduct a pilot recycling outreach project at various multifamily properties in Shoreline.

### WHY

The goal of this project was to better understand the feasibility and effectiveness of recycling outreach methods, with the ultimate goal of improving recycling behaviors at multifamily properties citywide.

### WHERE

The City targeted properties that represented a range of demographics, property sizes, levels of contamination in their recycling and resident engagement. Three properties participated in the first phase of the project: Henry House Apartments, Chateau Apartments, and The Blakely Apartments.

### HOW

The project piloted a variety of outreach strategies, including door-to-door visits, surveys, kick-off parties, and presentations. The project team monitored waste levels and contamination before and after outreach activities to gauge effectiveness.

### FINDINGS

Visual inspection revealed reduced contamination in recycling, although the level of recyclables in the garbage remained relatively constant over the project duration. These findings suggest that some residents may have improved their recycling practices but resident participation in recycling could still be improved.

### NEXT STEPS

To expand the 2011 pilot project, CleanScapes hosted nine recycling parties at apartments where recycling service was at or below 50% of garbage service levels. Over the course of the extended project, CleanScapes interacted with over 500 residents and distributed 320 recycling baskets/bins. The City and CleanScapes are currently working to expand the program by incorporating more door-to-door outreach in tandem with recycling parties.



# Recommendations for Further Action

**4A Continue to expand recycling and organics collection services at City facilities and open spaces.** *(Environmental Sustainability Strategy Rec-37)*



Introducing recycling and organics collection options at public places provides the City with an opportunity to reduce its municipal GHG footprint while also setting an example for residents and encouraging positive behaviors. Continued introduction of recycling containers at public spaces, such as bus stops, parks, and community buildings will reduce landfill emissions and allow municipal staff and community members to reduce their waste impact at work, at home, and around town.

**4B Establish space with large containers to collect and recycle yard debris from Public Works and Parks operations at Hamlin Yard and Brugger’s Bog.**

Currently, trees and branches are chipped and provided free to residents at Hamlin Yard, but the City lacks sufficient space to support the collection and recycling of the large amounts of yard debris produced during the maintenance of its public green spaces. The development of the new Brugger’s Bog maintenance facility provides an excellent opportunity to establish municipal compost collection, lower City disposal costs, reduce landfill methane emissions, and produce a valuable soil amendment.



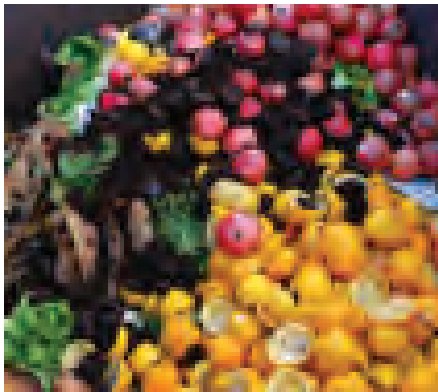
**4C Implement construction and demolition (C&D) waste reduction outreach and incentives through the permitting process.** *(ESS Rec-40)*

Shoreline City staff has developed a draft amendment to the Shoreline Municipal Code that would require all projects that need a building permit and cover more than 1,000



square feet to divert a minimum 50% of construction and demolition materials removed from a building site. The code amendment would also require applicants to submit a waste diversion plan as part of their permit application and to send all mixed material loads to a certified C&D processing facility. Similar codes have been adopted by dozens of other municipalities throughout the Northwest and in California. By finalizing and adopting this code amendment, Shoreline could join them in increasing reuse and recycling of building materials generated from construction and demolition projects.



**4D****Promote and encourage food scraps and yard debris recycling by residents and businesses through current education programs and the development of a new rate structure in the solid waste contract.**

Many Shoreline residents already have access to food scraps and yard debris recycling, but opportunities remain to expand resident participation and to increase the amount of food scraps recycled. Approximately 70 percent of single-family households with curbside garbage collection service in Shoreline subscribe to food scraps/yard debris collection, but according to a 2012 King County single family organics waste characterization study, fewer than 20 percent of subscribing households in King County place food scraps in their yard debris carts.<sup>27</sup> The study also

found that the food scraps participation rate and average pounds of food scraps placed in yard debris carts are higher for residents whose yard debris service is embedded in the garbage rate. In addition to continuing to promote food scraps recycling through its current education programs, the City of Shoreline could incentivize residents to participate in food scraps and yard debris recycling by developing a new rate structure in the solid waste contract that embeds the service with garbage collection or that offers a variety of affordable rate options to subscribing residents.

**4E****Consider shifting to every-other-week garbage collection and weekly organics collection.**

Renton’s City Council decided to shift to every-other-week garbage collection in 2009, and has found the decision saved the City money and decreased the number of truck trips through residential neighborhoods, resulting in fewer GHG emissions and reduced wear-and-tear on local streets. Cities regionally are finding that this shift in the collection schedule can extend the life of the landfill, which will reduce rates in the long term for residents, businesses and the City. Tacoma evaluated every-other-week garbage collection in 2012 and is now phasing in the new collection schedule for all residents. When Portland switched from weekly to every-other-week garbage pickups in 2011, they reduced the amount of garbage collected by 38 percent.<sup>28</sup> Seattle recently completed a pilot test of the strategy, and is currently considering widespread adoption. Shoreline could use a pilot project to evaluate the effects of every-other-week garbage collection, paired with weekly collection of food scraps and yard debris to achieve the City’s waste diversion goals.



4F

#### Consider establishing a recycling store that offers reusable items and products made from recycled materials.

In September 2012, CleanScapes opened its first retail experience in Issaquah's Gilman Village. The store provides a one-stop shop for residents to pay their bill, drop off hard-to-recycle items, and buy reusable items and "up-cycled" products made from recycled materials. Such a store in Shoreline could provide a central community space for promotion of climate-smart products.



4G

#### Intensify collaboration and outreach with second-hand stores and King County to promote textile collection and recycling.

Twenty years ago, the average American bought fewer than 30 pieces of clothing per year, but today the average is about 60 items.<sup>29</sup> As consumption has risen, so has disposal – textiles, which include materials such as towels, blankets, and sheets, now account for 4 percent of all disposed residential waste in King County.<sup>30</sup> Many residents already donate gently used clothing in good condition to second-hand stores, but few people realize that there is a strong recycling market for used textiles. In addition to the Shoreline Recycling and Transfer Station, second-hand stores in Shoreline, such as Deseret Industries and Shoreline Goodwill, collect textiles for reuse or recycling.

4H

#### Support and promote efforts to extend the useful life of products through repair and reuse.

In today's world, broken products often get tossed-out and replaced, but repair and maintenance of products can keep them in good, working condition and out of landfills, while saving consumers money. Local governments like Shoreline can promote repair and other product life-extending activities by supporting or hosting community "Repair Cafes," where volunteers help participants learn how to repair broken household items, or offer free repair services. First started in the Netherlands in 2007, Repair Cafes are spreading around the world. Locally, the [West Seattle Fixers' Collective](#) comes together twice a month to tackle repairs of broken possessions.

4I

#### Encourage the use of recyclable products for take-out food containers and utensils in food-service businesses.

Throughout its lifecycle, expanded polystyrene food packaging products, such as "clamshell" carryout containers and hot beverage cups, threaten public and environmental health. Manufactured with petroleum products, polystyrene can leach harmful chemicals into hot foods and liquids, never biodegrades in landfills, and is very difficult to recycle. Recyclable or compostable paper- or plastic-based alternatives are safer for public health, reduce the need for fossil fuel inputs, and can be more easily recycled.



## What You Can Do

Reducing waste and increasing recycling starts with you! Here are some things residents and businesses can do to reduce their waste-related climate impact.



### Compost all food scraps in your curbside yard debris cart or in your backyard.

Composting is a great alternative to throwing organic waste into the garbage. It not only reduces harmful methane emissions from landfills, but it also allows you to pay for a smaller, less expensive garbage cart, and provides beneficial compost fertilizers for landscapers and farmers in the region. Making sure you understand what can go into the compost bin, and taking steps to compost those items can benefit your wallet, your health, and our community.

### Recycle plastic laundry baskets and more in your curbside cart!

These days, you can recycle Tupperware, plastic lawn furniture and bagged plastic bags in your cart, in addition to typical materials, such as bottles and cans. Although not collected through the curbside program, “hard-to-recycle” items, such as textiles, mattresses, bicycles, and electronic waste are now easily recycled and accepted at some local recycling and transfer centers. To find out what and where you can recycle, visit King County’s “What Do I Do With...?” [website](#).

### Extend the useful life of products you own by repairing, selling, or donating them for reuse.

Before you toss a broken item, consider starting or joining a Repair Café and learn how to fix it yourself. The [Repair Café Foundation](#) provides information for communities and individuals about how to start a repair café.

When you’re ready to part with an item, consider posting it on [craigslist.org](#) or donating it to a second-hand store. Know and use locations where you can drop off your old products for reuse.





## Reduce GHG emissions embodied in materials and food consumed

What Shoreline is doing to reduce GHG emissions of materials and food consumed

### Municipal

#### Environmentally Preferable Purchasing

In January 2012, the City of Shoreline adopted Environmentally Preferable Purchasing (EPP) Guidelines. These guidelines seek to reduce the potential adverse environmental impact of City purchasing decisions by buying goods and conducting business with manufacturers, vendors, contractors, and consultants who share the City's commitment to the environment. They include environmentally preferred purchasing policies for priority categories, which range from sustainable consultant practices to the green fleet program and office supplies. Although these guidelines are not mandatory, many of the guidelines are being implemented.

Examples of environmentally responsible purchasing include the use of 100% recycled content paper for all black and white printing, and asking contractors not to purchase or use pesticides for routine landscaping maintenance when working in the City. In addition, products made from recycled materials were used in the construction of the City Hall, resulting in reduced emissions from the disposal of materials and in avoided emissions from mining and manufacturing of new virgin materials.

### Community

#### Supporting Local Food

Buying local is a great way to reduce community emissions from the cultivation and transportation of food to Shoreline. A recent study found that conventional food distribution uses 4 to 17 times more fuel and emits 5 to 17 times more GHG emissions than local and regional distribution systems.

The City has a long history of supporting the community's interest and commitment to local food production. Development and support of community gardens, such as Twin Ponds Park, has been a way to connect residents to their neighbors, their local landscape, and healthier and more sustainability living. Through the [Diggin' Shoreline](#) non-profit group, the City supports place-based, local nourishment through education programs, networking, resource sharing, and community gardening. The City also supports the [Shoreline Farmers Market](#)—a hub of community activity around local and sustainable living.



## Recommendations for Further Action

### 5A Increase percentage of recycled content in paper to 100% for color copies when possible.



Currently, the City only uses 100% recycled content paper for black and white printing. Expanding the use of recycled content paper to include color printing copies could lower the City's carbon footprint without compromising on quality. Although the recycled content in paper was a concern in the early years of printing, commercial printers and copier machine manufacturers today agree that recycled paper is suitable for all their machines. They only require good quality paper, whether recycled or virgin.<sup>31</sup>

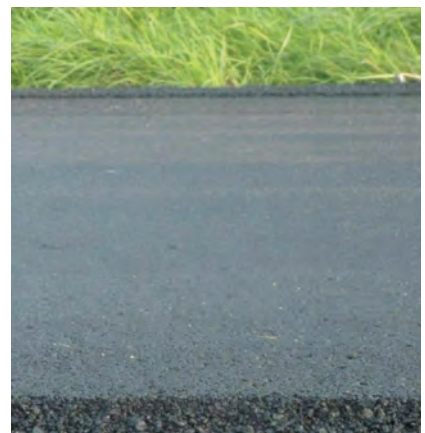
### 5B Select new electronics that meet Electronic Product Environmental Assessment Tool (EPEAT) standards and consider becoming an EPEAT purchasing partner when possible.



As a global registry for greener electronics, [EPEAT](#) provides an easy-to-use resource for purchasers seeking environmentally preferable products. By committing to using EPEAT to select electronic products, the City of Shoreline could gain recognition as a green IT leader and support market recognition for strong environmentally-performing electronic products.

### 5C Investigate the use of recycled asphalt shingles (RAS) or other recycled products in asphalt used for City paving projects.

Using recycled asphalt shingles (RAS) in pavement can reduce paving costs, divert valuable resources from landfills, and reduce GHG emissions. According to the EPA, recycling one ton of shingles reduces greenhouse gas (GHG) emissions by 287 lbs of carbon dioxide equivalents (CO<sub>2</sub>e). With asphalt shingles comprising approximately 10-12% of the construction and demolition (C&D) waste being disposed in King County, this material represents a reuse opportunity. The City of Shoreline could investigate the use of RAS or other recycled products in City paving projects. The [King County Linkup](#) project can provide technical assistance to local governments interested in using RAS.



5D

**Consider seeking grant funds to launch a “Food: Too Good to Waste” campaign (supported by the EPA) to encourage food waste reduction by residents.**

Forty-four percent of all food produced or imported for consumption in the United States ends up in a landfill or compost pile (USDA, ERS 2010). Through its West Coast Climate and Materials Management Forum, the EPA’s Region 10 office in Seattle developed a toolkit to help support implementation of “Food: Too Good to Waste” campaigns to reduce food waste at the source through planning, shopping, preparation, and storage. The **toolkit** can be customized and used by any interested local government or community group, and includes messaging strategies, an implementation guide, outreach tools, and a background research report.



5E

**Promote the use of the City’s mini-grant programs to support “collaborative consumption” community projects like tool libraries and repair cafes.**

Projects that bring the community together to share and synergize resources and talents, such as tool libraries, repair cafes, and community time banking systems, generate a multitude of community benefits, including a supported local economy, strengthened community networks, and reduced waste. The **West Seattle Tool Library**, a project of Sustainable West Seattle, was made possible by a neighborhood grant from the Seattle Department of Neighborhoods.<sup>32</sup> Actively seeking such grant opportunities could allow Shoreline to enjoy the benefits associated with such projects.



## What You Can Do

Here are some things Shoreline residents and businesses can do to reduce emissions from the materials they purchase and food they consume.



### Eat local and organic.

The benefits of local and organic food go beyond the reduction of greenhouse gas emissions. Local food is fresher, typically tastes better, supports the local economy, and preserves important green space and farmland. To eat more local and organic foods, grow your own food at home or in a community garden, and purchase food from local farmers who produce food without using petroleum-based additives.

### Reduce your consumption of meat and dairy.

The raising of livestock results in the emission of methane from the physiological processes in livestock, as well as from fertilizers used to produce the feed. Reducing your meat consumption or switching to less “climate-changing intensive” meat, such as poultry, could reduce your climate impact.

### Implement meal planning, shopping, and food storage habits that reduce food waste.

There are many easy fixes for throwing too much food (and money!) into the garbage. Use smart shopping lists that identify how much food you need (and already have), store fresh food in the fridge once it's ripe, and build your shopping lists around planned meals.

### Participate in collaborative consumption projects like tool libraries and car sharing networks.

Get to know your neighbors while reducing waste! Participate in projects that share resources and talents within the community. Examples include the [West Seattle Tool Library](#), [Relay Rides](#), and Shoreline's own [SWEL Timebank](#).





# Transportation, Land Use, and Mobility



METRO  
240  
Clyde Hill  
550  
Bellevue





## Vision

The City of Shoreline seeks to create a mobile, clean, and healthy community where walking, bicycling, and taking the bus are safe, easy, clean, and efficient options. In addition, the City seeks to embody this vision in its own policies and operations by facilitating multi-modal employee commuting, work schedule options that reduce the need to commute, an efficient vehicle fleet, and support for low-carbon transportation and land use decisions.

## Challenge

The movement of goods and people by cars, trucks, and other vehicles requires significant energy inputs. Greenhouse gas emissions from transportation result largely from the combustion of petroleum-based fuels in cars, sport utility vehicles, pickup trucks, and minivans.<sup>33</sup> In Shoreline, vehicle travel accounts for over half of all community greenhouse gas emissions, which is equivalent to about 3,700 tanker trucks of gasoline.<sup>34</sup>

## Objectives

Shoreline seeks to achieve the following objectives to reduce vehicle travel greenhouse gas emissions.

- OBJECTIVE 6. Reduce fossil fuel consumption by vehicles.**
- OBJECTIVE 7. Reduce use of single occupancy vehicles.**
- OBJECTIVE 8. Increase convenience and safety of alternative transportation.**
- OBJECTIVE 9. Concentrate new growth in proximity of services and transit.**



## Reduce fossil fuel consumption by vehicles

In 2012, vehicles constituted 53 percent of the community's total emissions. Since vehicles last for many years, vehicle purchasing decisions can “lock-in” greenhouse gas emission profiles for five to ten years. Decisions about what types of vehicles are driven and how they are used are extremely important to minimize greenhouse gas emissions from this significant source.

### What Shoreline is doing to reduce fossil fuel consumption

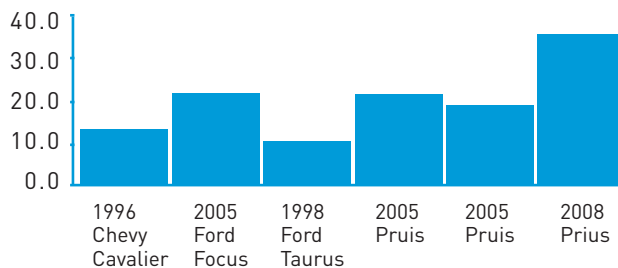
#### Green Fleet Program

As part of the Environmentally Preferable Purchasing Guidelines, the City established its Green Fleet Program and now incorporates sustainable purchases and practices into fleet acquisition, operations, and maintenance.

#### Hybrid Vehicles

To-date, the City has introduced three hybrid vehicles into its fleet: two 2005 and one 2008 Toyota Prius. On average, these hybrid vehicles have been 69 percent more fuel efficient than other similar sedans in the Shoreline fleet. The hybrids traveled 16 more miles per gallon of gasoline, with an average fuel efficiency of 39 miles per gallon.

**Figure 9. Average Miles Per Gallon for Shoreline Fleet Passenger Vehicles**



#### No Idle Zone

Reducing the amount of idling of fleet vehicles lowers fuel use and costs, extends vehicle life, and improves air quality. The average American driver spends over 16 minutes a day (which equates to 8 hours a month or 4 days a year) idling their vehicles. Across the US, idling accounts for 1.6 percent of all U.S. greenhouse gas emissions.<sup>35</sup>

The City has proposed a “No Idle Zone” draft policy at City facilities. The City has also installed LED light bars in emergency response vehicles to allow safety light bars to flash while the vehicle is turned off, thanks to funding from a King County Solid Waste grant. The LED lights last twice as long and are 80 percent more efficient than conventional light bars. As resources become available, additional LED light bars will be purchased.

#### Encouraging Efficient Vehicle Use

Visitors who charge their vehicle at one of four electric vehicle (EV) charging stations at City Hall enjoy a double benefit. Not only is their vehicle powered by low-emissions electricity from Washington's clean hydropower-dominant power grid, but they also enjoy the shade of the 20kW solar panel awning above each vehicle. In addition, these electric vehicle charging stations make away-from-home charging more accessible to Shoreline residents and businesses, demonstrate the viability of electric vehicle transportation, and reduce the number of fossil fuel-driven vehicles on Shoreline roads.

## Recommendations for Further Action

### 6A Continue investing in more efficient fleet vehicles.

More energy-efficient and cleaner-burning vehicles improve local air quality, reduce greenhouse gas emissions, reduce fossil fuel use, and make public funds available for other beneficial uses. The introduction of three high efficiency hybrid vehicles to the City's fleet saved the City an estimated 900 gallons of fuel and \$3,400 in fuel costs in 2012.<sup>36</sup> When possible, the City should continue to make the City fleet cleaner and more efficient by purchasing more fuel-efficient vehicles and upgrading to LED light bars that reduce idling.

### 6B Support community installation of electric charging stations.

The transition to low-emission electric vehicles in Shoreline will require an investment in their infrastructure. As electric vehicle production and purchases increase, the need for EV charging stations will grow. The Shoreline community already has access to a handful of electric charging stations throughout the city, including three at Walgreens locations in Shoreline, three at Sears, and two at Shoreline Community College, but many more will be needed. Continuing to encourage the installation of electric charging stations throughout the community will allow the City to continue laying the groundwork for a reduced dependency on fossil fuel-driven cars.



### 6C As part of the new water utility, consider installation of “smart” water meters to reduce the vehicle miles required for utility staff to read meters.

“Smart” meters automatically transmit data about each home’s water usage, eliminating the need for utility staff to drive house-to-house to read meters. Vehicle, staff time, and fuel cost savings from this technology can add up quickly. The City of Renton estimates that installation of new “smart” water meters could save them as much as \$800,000 a year.<sup>37</sup> Piloting smart water metering systems in select neighborhoods in Shoreline could serve as an important step towards lowering the utility’s vehicle miles travelled, fuel use, and greenhouse gas emissions.

### 6D Consider participation in the Evergreen Fleets program to reduce the use of petroleum and support clean air.

Evergreen Fleets is a voluntary regional green fleet certification program operated by the Puget Sound Clean Air Agency that provides tools and information for municipalities, businesses, and organizations that want to integrate sustainable practices into their fleet. Certified fleets must demonstrate “green” vehicle management practices, such as fuel-efficient driving, use of alternative fuels, and retrofitting of diesel engines. Fleets are also rated on their ability to demonstrate annual reductions in greenhouse gas emissions.<sup>38</sup> Participation in the Evergreen Fleets program would provide Shoreline with guidance and recognition as the City seeks to reduce greenhouse gas emissions and increase the efficiency and performance of its vehicle fleet.





## What You Can Do

Car and truck transportation makes up the highest amount of total household greenhouse gases in King County, contributing to 20 percent of the average household's carbon footprint. Actions that increase the efficiency of vehicles we drive can help lower that footprint and save money at the gas pump.



### Keep your tires properly inflated and tuned up to maximize fuel efficiency.

A 2001 Department of Transportation study found that 60-80 percent of cars on the road have tires that are underinflated by as much as 10 percent. Driving on underinflated tires can decrease fuel efficiency. According to the U.S. Department of Energy, underinflated tires can reduce your fuel efficiency by up to \$0.11 per gallon. To ensure that your tires are properly inflated, regularly check your tire pressure and adjust it to meet the specifications for your vehicle, which is listed on the sticker on the driver's side door jamb or glove box. Proper tire inflation not only reduces fuel use, it also keeps you safer and helps your tires last longer.



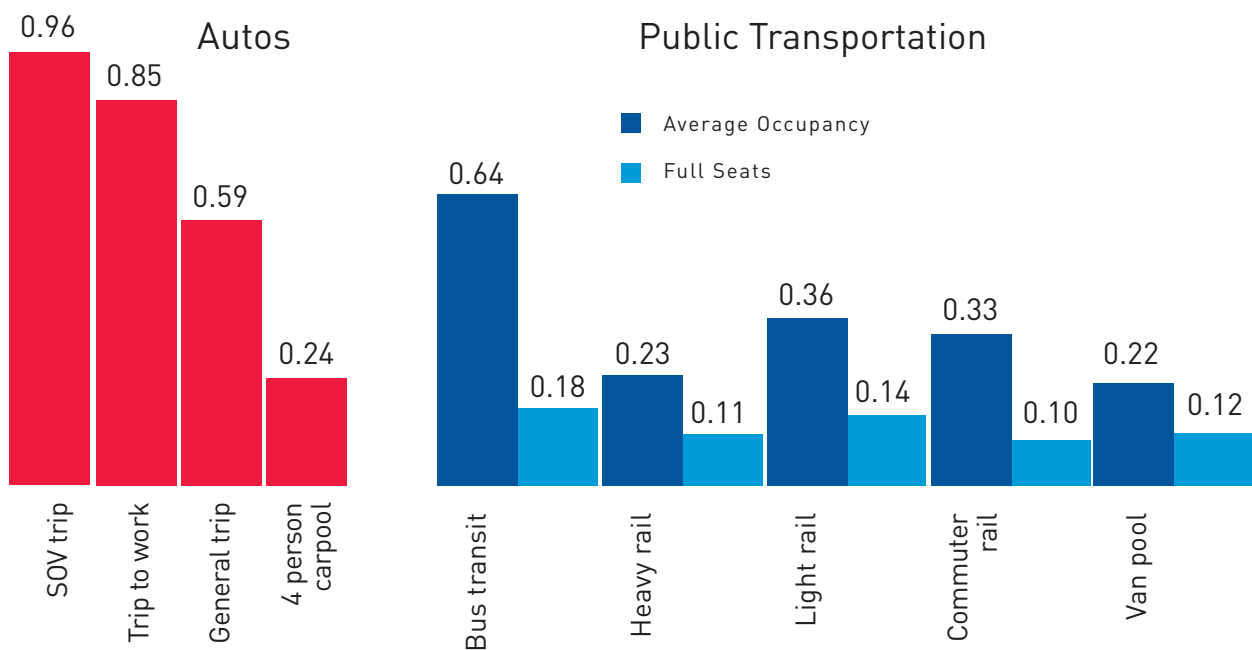
### When purchasing a new vehicle, choose a high-efficiency model.

A King County study recently identified highly-efficient personal cars and trucks as the single most effective purchasing decision a household can make for reducing its greenhouse gas emissions. Next time you're in the market for a new vehicle, visit [www.fueleconomy.gov](http://www.fueleconomy.gov) to find updated, comprehensive information on the cleanest and most fuel-efficient vehicles on the market.<sup>39</sup>

## Reduce use of single occupancy vehicles

Miles driven with only the driver in the car account for roughly two-thirds of transportation-related emissions in the United States. Alternative modes, such as public transit, produce significantly lower greenhouse gas emissions per passenger mile than private vehicles. According to the U.S. Department of Transportation, light rail systems produce 60 percent fewer emissions than single occupancy vehicles (SOV) per passenger mile, and bus transit produces 32 percent fewer emissions (see Figure 10).<sup>40</sup> Actions to reduce the use of single occupancy vehicles can drastically improve air quality and the community's climate footprint.

**Figure 10. Estimated CO2 Emissions Per Passenger Mile for Average and Full Occupancy**



Source: U.S. Department of Transportation, Federal Transit Administration

### What Shoreline is doing to reduce single occupancy vehicles (SOVs)

#### Non-SOV Transportation Planning

In accordance with the Washington Commute Trip Reduction Efficiency Act, the City of Shoreline Commute Trip Reduction Plan outlines strategies and steps for reducing drive-alone trips and vehicle miles traveled (VMT) by employees. The plan applies to large employers with 100 or more employees arriving at the work site between 6:00-9:00 a.m., including the City of Shoreline, Shoreline Community College, and Washington State public facilities. It implements guidance within the City's Comprehensive Plan, Transportation Master Plan, and development

regulations that contribute to meeting SOV and VMT reduction goals. Goals and policies include transit stop improvement requirements, such as RapidRide; encouragement of Park and Ride lots and alternative modes of transportation; guidelines for ensuring more adequate parking supply; and policies around electric vehicle charging station installation, car sharing programs, and bicycle lanes, parking, and storage.

## Commuting Incentives for Shoreline City Employees

The City provides a variety of incentives for more efficient and healthy commuting practices by City employees, including parking for carpoolers in the City garage, storage for bikes, discounted ORCA cards for employees, and flex schedule options for compressed work weeks.

*During the 2013 Bike-to-Work month, 21 City employees rode their bikes a total of 1,646 miles, avoiding 0.7 metric tons of CO<sub>2</sub>e that would have been generated from SOV commuting.*

Every May, City employees participate in Bike-to-Work Month, a competition among regional employers to encourage bike commuting.

### Looking Beyond Car Ownership

Shoreline's Transportation Master Plan (TMP) outlines an abundance of strategies for reducing Shoreline's SOV dependency. The goals, policies and implementation strategies of the plan focus on increasing the diversity, abundance, and reliability of transportation options in Shoreline, including development of non-motorized transportation facilities and transit system improvements. Examples of strategies in the plan are listed below:

- TMP Policy T2: Reduce the impact of the City's transportation system on the environment through the use of technology, expanded transit use, and nonmotorized transportation options.
- TMP Implementation Strategy 5.2: Support state and federal tax policies that promote transit and ridesharing.

- TMP Implementation Strategy 5.3: Develop parking system management and regulations to support alternatives to the single occupancy vehicle.
- TMP Implementation Strategy 6.1: Work with major employers, developers, schools, and conference facilities to provide incentives to employees, tenants, students, and visitors to utilize alternatives to the single occupancy vehicle.
- TMP Implementation Strategy 10.9: Encourage the use of programs and services that minimize the need to own a car, such as car sharing and increased transit use.
- TMP Goal T VIII: Develop a bicycle system that is connective, safe, and encourages bicycling as a viable alternative method of transportation.
- TMP Goal T IX: Provide a pedestrian system that is safe, connects to destinations, accesses transit, and is accessible by all.

### Shoreline Walks Program

**Shoreline Walks** is a new community walking program that encourages Shoreline adults to leave their car at home and explore their local community, stay healthy, meet new people, and feel safer and more confident as a pedestrian. The program organizes and leads free walks through neighborhoods, parks, and trails throughout the city. Each walk is given a difficulty scale rating to allow walkers to choose the walks that work best for their abilities.



# Recommendations for Further Action

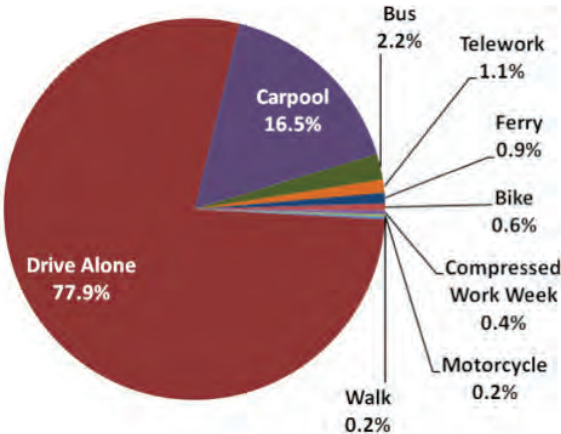
## 7A Expand the Commute Trip Reduction program and support services to include medium size employers.

Although the current City Commute Trip Reduction (CTR) program only applies to large employers, expansion of this program to include medium-sized employers could bring about a variety of benefits for the city, including improved air quality, reduced congestion, and a lower transportation carbon footprint. In the meantime, the City could continue to implement Strategy 6.2 of the Shoreline Transportation Master Plan, which calls for the City to promote alternatives that encourage all business employees and tenants to pursue alternative transportation choices.

## 7B Continue to encourage a decrease in Single Occupancy Vehicle commuting by City employees.

In 2012, City employee commuting made up 20 percent of the City’s municipal greenhouse gas emissions, equivalent to the greenhouse gas emissions from burning 2.8 railcars worth of coal. Although the City currently provides a variety of incentives to encourage non-SOV employee commuting, including ORCA passes, bike storage, and carpool parking, the most recent CTR survey indicated the vast majority of City employees (80%) still drive alone to work (see Figure 11). The City could pursue new and expanded efforts, communication strategies, competitions, recognition programs, incentives, and events to encourage non-SOV commuting. Since many employees commute to Shoreline from other counties, the City should continue to advocate and encourage regional transit system improvements, as outlined in the TMP.

Figure 11. City of Shoreline Employee Commuting, by Number of Trips



Source: 2012 Commute Trip Reduction Survey

## 7C Consider establishing a car sharing program, such as Zipcar, at City Hall for use by City employees and Shoreline residents.

Car sharing carries benefits for businesses, employees, and the community. It encourages non-SOV commuting, relieves parking demand and traffic congestion, and is cheaper than owning and maintaining a vehicle. Introduction of a car sharing service at City Hall would enable City employees and Shoreline residents to take short trips to the post office, a doctor’s appointment, or lunch meeting without their personal vehicle. The City could explore opportunities for hosting this service with local service providers, such as Zipcar and Car2Go.



## What You Can Do

Driving solo substantially increases your carbon footprint. If just one driver per household switched to taking public transportation for a daily commute of 10 miles each way, the household could reduce its annual greenhouse gas emissions by 8%. This reduction has a greater impact than other actions, such as replacing light bulbs with LEDs or adding R-40 insulation to a home attic. Here are some ways to reduce your single occupancy vehicle climate impact.



### Choose to bike, walk, take public transit or carpool.

Short trips around town can be easier, quicker, and more enjoyable by foot, bike, or bus. Biking and walking to work or to run errands is a great way to get some fresh air and stay fit. Carpooling with co-workers fosters collaboration, friendship, and can be faster when using an HOV lane. For your next trip to work, a friend's house, or the grocery store, ditch the keys and the driving stress and explore a new mode of travel. Don't know where to start? Visit [www.rideshareonline.com](http://www.rideshareonline.com) to find biking partners, vanshares, transit connection options, and tips for taking your bike on the bus.



### If your household has more than one car, try to eliminate a car and borrow or share a second vehicle when you need one.

Owning a vehicle can be a major household expense. According to the Automobile Association of America, the average cost of owning a car that is driven 15,000 miles a year is \$9,122, including fuel, maintenance, tires, insurance, license registration taxes, depreciation, and financing. By utilizing alternative transportation options, coordinating transportation, and utilizing car-sharing services when an additional vehicle is needed, your family may be able to eliminate the cost of owning a second vehicle, and reduce your household's carbon footprint in the process. One potential goal of light rail station area planning is to make it feasible for households within at least a quarter mile radius from the stations to meet their needs with only one car per household.



### Participate in Rideshare Online.

A regional project of the WA Department of Transportation, [RideshareOnline.com](http://RideshareOnline.com) not only provides ride-matching services and SchoolPool carpooling programs, but also has a free online tool to help develop and implement customized employee benefit programs. The Trip Calendar can help employees track their trip reductions, reduced gas consumption, and reduced GHG emissions; and the Cost Savings Calculator can help employees calculate the real cost savings of their ridesharing or commuting alternative.



### Start a King County InMotion program.

The **King County InMotion** program helps neighborhoods start a community-based social marketing campaign that encourages residents to commit to alternative-mode commuting. The program, which has been successfully implemented at Seattle Children's Hospital, Swedish Hospital and the City of Seattle, uses a calendaring software that allows employees to track progress and receive recognition for using alternative modes of transportation on their commute. Contact [inmotion@kingcounty.gov](mailto:inmotion@kingcounty.gov) for more information.



## Increase convenience and safety of alternative transportation

Building the infrastructure to support alternative transportation systems, such as pedestrian, biking, and transit is necessary, but not sufficient to implement the transition to alternative forms of mobility and transportation. To make the switch, Shoreline residents must perceive alternative transportation options as safe and convenient, compared to the single occupancy vehicle. Actions taken by the City to make alternative transportation safer and more accessible can encourage these low-emission modes of travel, take cars off the road, and lower the city's climate change impact.

### What Shoreline is doing to increase the safety and convenience of alternative transportation

#### 2011 Transportation Master Plan

Due to significant progress that had been made in updating and improving the City's transportation systems, the City decided in 2009 to update the existing Transportation Master Plan (TMP). The TMP was adopted in 2011, and describes a multi-modal transportation system that provides facilities and services to encourage walking, bicycling, and transit as priority modes. The policies and goals set forth by the TMP's Bicycle, Pedestrian, and Transit Plans represent a tremendous step towards building a thriving Shoreline community, where people walk, bike, and ride throughout the city and beyond.

#### Completion of the Interurban Trail and Installation of Bicycle Facilities

In 2008, the City completed the Interurban Trail, a 3.25-mile bicycle and pedestrian trail that serves as the "spine" of the City's bicycle system and connects commercial areas, neighborhoods, transit corridors, and parks. As part of a regional trail that includes the cities of Edmonds to the north and Seattle to the south, the Interurban Trail provides a basis for the City's development of an extensive, citywide bicycle system. With the Interurban Trail complete, the City continues to move forward with bicycle transportation system improvements as shown in the Bicycle System Plan in the TMP. Thanks to recently secured grants, the City will soon begin a project to install separated trails, street markings and signage to "connect" the Interurban Trail with the 20-mile Burke Gilman trail. The recent

installation of several "sharrows" (shared lane markings) on streets and bicycle route signage in the city help make cycling more accessible, efficient, and safe for Shoreline residents and commuters. In addition, the Bicycle Plan identifies strategies for increasing bicycling throughout the city, including development of wayfinding signage, accommodating bicycles in future roadway and intersection projects, and educating people about bicycle safety.



## Pedestrian-Friendly Sidewalks and Walkways

Shoreline was originally built with approximately 400 miles of roads that did not include sidewalks. Citizens and the City Council continue to advocate for additions to the network, and the 2011 Transportation Master Plan (TMP) outlines priorities for funding sidewalk projects. The Aurora Corridor Improvement Project and the North City Project included sidewalks as a fundamental part of their safety and circulation enhancements.<sup>41</sup> The Priority Sidewalks program constructed sidewalks and walkways throughout the city from 2005 to 2011, and the Curb Ramp, Gutter, and Sidewalk Program removes barriers within the sidewalk system, eliminates damaged sections, and completes missing links. As part of the TMP, the City's Pedestrian Plan includes strategies for increasing walkability throughout the city, including utilization of existing undeveloped right-of-ways for pedestrian paths, and development of a policy and procedure for the location, design, and approval of crosswalk markings. Updates to the Engineering and Development Guide require new development to meet current standards for sidewalk construction.

## Coordination with Transit Agencies

The creation of a transit-driven community in Shoreline requires that transit services match demand. The City has been working closely with Metro Transit to support and coordinate the upcoming RapidRide service on Aurora Avenue N. Coordination efforts include the recent completion of improvements to Aurora Avenue N from N 145 Street to N 192 Street, with similar improvements planned for the last mile north. These improvements will improve transit speed, reliability, and comfort along the corridor. Other improvements include the construction of sidewalks along or connecting to transit corridors, and the installation of technology that gives signal priority to busses to help facilitate speed and reliability of transit service.

## Safe Routes to School Program Grants

Thanks to funding from WSDOT's Safe Routes to School program, the City recently partnered with the Shoreline School District and Shoreline Police to complete sidewalk improvements near Briarcrest Elementary school that will provide a safer walking option for students.

In addition, the City has received another \$435,000 in Safe Routes to School funding to build sidewalk improvements around Einstein Middle School.



Photo courtesy PedNet Coalition



## Planning for Light Rail

Another component of the TMP, the City's Transit Plan, includes goals, policies, and implementation strategies for ensuring that Sound Transit's Light Rail system provides service that is reliable, accessible, and safe for the Shoreline community. In preparing for the development of two stations within Shoreline, the City Council crafted Framework Goals, which were adopted as Policies LU20-43 in the 2012 Comprehensive Plan. These goals, community input, and studies on market potential and traffic will culminate in subarea plans for areas within roughly a half-mile from potential stations at NE 185 Street and NE 145 or NE 155 Streets. There are global, regional, community, and neighborhood benefits that can be achieved through good planning for station areas. Most notably, residents of mixed-use Transit-Oriented Communities will have more convenient access for commuting by light rail, and should also have better access to local and regional goods, services, and activities. If these amenities make it feasible for households to reduce vehicle trips, or potentially own fewer cars, this will have a significant impact on reducing Shoreline's carbon footprint. In 2012, vehicles constituted 53 percent of the community's total emissions.

Service for light rail is expected to begin in 2023, but the City will spend 2013 and 2014, working with the community to draft design and transition standards, determine appropriate zoning, and make other decisions that will determine much about the look and feel of station areas that will develop over the next several decades. Visit [www.shorelinewa.gov/lightrail](http://www.shorelinewa.gov/lightrail) for information and to find out how to be involved.

## Public Outreach and Education

Policies in the Transportation Master Plan support the development of a public outreach program for pedestrian and bicycling options, safety, and benefits. Strategies in the plan include preparation of pedestrian and bicycle facility maps, education materials, and working with the school district and public safety partners to integrate pedestrian and bicycle safety and maintenance as part of the educational curriculum.





## Recommendations for Further Action

8A

**Use environmental mini-grants, City communications, and other tools to encourage community efforts to shift to alternative modes of transportation.**

It will take action by the entire community to realize the promise of reduced GHG emissions through alternative transportation, but the City can continue to support and foster community efforts. Examples of possible City actions include devoting a portion of environmental or neighborhood mini-grants to projects that increase the safety and convenience of alternative transportation. The City can also communicate the benefits of walking, biking, and public transit to the community in all public messaging.



Photo courtesy of The Shoreline Solar Project



## What You Can Do

The safety and accessibility of walking, biking, and public transit is not just dependent on permanent infrastructure such as signage, lanes, trails, and bus stops. As a fellow traveler and resident, you have a responsibility to make the road, trail, and sidewalk safe for everyone. Here are some ways to help create an alternative transportation-friendly environment for your neighbors.



### When driving, share the road with cyclists and pedestrians.

On the road, cyclists and pedestrians are in far greater danger than vehicles. When driving, be cognizant of non-motorized residents, and take actions to make their experience safer. That includes not using your cell phone, passing slowly, leaving plenty of space (3 feet is the rule of thumb), and watching for pedestrians and cyclists before pulling into the crosswalk area, turning right, or merging.

### Participate in a “walking school bus” to help children get to school safely by foot.

A walking school bus is a group of children walking to school with one or more adults. Your participation in a walking school bus can help address safety concerns, fight childhood obesity, and build positive behaviors. Find more information at [www.walkingschoolbus.org](http://www.walkingschoolbus.org).

## Concentrate new growth in proximity of services and transit

Development decisions impact communities. Decisions around what, where, and how we build informs many of our day-to-day activities, including where we go, how we get there, and what that means for our health, happiness, and the environment. Directing growth and development towards areas with ample transportation services can literally lay the groundwork for building a community that walks more and drives less.

### What Shoreline is doing to concentrate new growth in proximity of services and transit

#### Transit-Oriented Development Community Engagement

The City has partnered with Feet First to host interactive walking and driving tours around areas near future Sound Transit light rail stations. During the tour, residents are familiarized with the area and encouraged to consider land use through an “urban planning” lens.

In 2013, the City started an extensive public involvement process for light rail station area planning, which includes partnerships with citizen-initiated committees, a Planning Commission subcommittee, and local and regional stakeholders. The process will work towards creating a vision for the areas around the stations that harmonizes with the City’s policies and can be implemented through zoning and other land use decisions for the area.

#### The Aurora Corridor Project

The section of Aurora Ave N between N 145 Street and N 192 Street was recently redeveloped to improve walkability, traffic flow, and transit speed and reliability. The newly improved Aurora corridor features wide, continuous sidewalks; amenity zones that provide a buffer between the sidewalks and travel lanes; aesthetic elements, such as public art, special light features, and pavement patterns; and transit-friendly elements, such as bus shelters. The final stage will be to complete improvements all the way to N 205 Street, which will serve the Aurora Village Transit Center.

In addition to improvements to aesthetics, safety, and transit infrastructure, the project also incorporated many features that contribute to carbon sequestration and water quality. In the first 2.5 miles, a total of 557 new trees were planted, 9,827 square feet of porous pavers were installed, and 9,807 square feet of bioswales

were constructed. In addition, tree cells were used to protect sidewalks and utilities from root growth, and engineered filter boxes were added to remove pollution from runoff.

#### Town Center

In July 2011, the Shoreline City Council adopted the Town Center Subarea Plan and Development Code (Ordinance 609) to facilitate compact, walkable, and mixed-use development in the Town Center of Shoreline. As a product of the City’s Vision 2029, the plan includes policies for creating a walkable Town Center with access to bus rapid transit service and amenities, such as grocery stores and restaurants. In March of 2013, the City Council used this code as a basis for creating new commercial design standards and zoning for all commercial zones. These new standards encourage smarter development through reduced minimum parking requirements, more pedestrian-friendly design standards, and expanded density limitations that allow for increased housing options near retail and services.

#### Town Center Vision Statement

Shoreline’s vision for its Town Center exemplifies the City’s commitment to transit-oriented development.

“Shoreline Town Center in 2029 is the vibrant cultural and civic heart of the City with a rich mix of housing and shopping options, thriving businesses, and public spaces for gatherings and events. People of diverse cultures, ages, and incomes enjoy living, working, and interacting in this safe, healthy, and walkable urban place... Connections to neighborhoods and the region are convenient and accessible through a system of paths, roads, and public transit.”



## Recommendations for Further Action

### 9A Utilize zoning and permitting methods to concentrate new growth in proximity of services and transit. *(ESS Obj-8)*

Shoreline's Comprehensive Plan supports zoning for increased mixed-use redevelopment within Transit-Oriented Community areas along Aurora Avenue and near light rail stations. Policy LU 9, for example, calls for new zoning designations that allow for increased densities of development that include a more diverse mix of uses, including retail, service, office, and residential. Policy LU31 of the plan also calls for creation of a strategy, in partnership with the adjoining neighborhoods for phasing redevelopment of current land uses to those suited for Transit-Oriented Communities. The City should continue to identify opportunities for encouraging smart redevelopment and growth along high transit corridors, such as Aurora Avenue and by the new light rail stations.

### Aurora Square Community Renewal Area

The Shoreline City Council designated the 70+ acre Aurora Square as a Community Renewal Area (CRA) where economic renewal would clearly deliver multifaceted public benefits through the development of smart-built infrastructure, residences, offices, and generous open spaces that are tied to transit, neighborhoods, and the Interurban Trail.

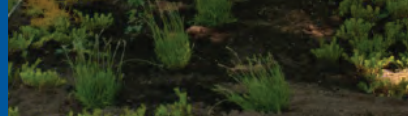




Urban Trees,  
Parks, and  
Open Spaces



# Urban Trees, Parks, and Open Spaces



## Vision

Preserve urban forests and the multi-layered benefits they provide to the community, including aesthetic appeal that attracts businesses and residents, stormwater management, air quality enhancement, wildlife habitat diversity, and shade from the hot summer sun.

## Challenge

Urban trees, parks, and open spaces are the healthy lungs of Shoreline. They absorb air pollutants and greenhouse gases and release fresh oxygen. This process of absorbing greenhouse gases—called “carbon sequestration”—is a critical component of reducing the City’s greenhouse gas impact. A new study by the U.S. Forest Service found that urban trees across the U.S. provide \$2 billion in environmental services a year. Included in that value is 25 million tons of carbon sequestered by urban trees annually, equivalent to the emissions from providing energy to over 1 million homes for a year.<sup>42</sup>

As urban populations increase and green spaces with trees are converted to roads and housing, the temperature and greenhouse gases in cities increase. Urban trees, parks, and green spaces can play an important role in mitigating these impacts.

## Objectives

Shoreline seeks to achieve the following objectives for sequestering carbon through urban trees, parks, and open spaces:

OBJECTIVE  
10.

**Prevent tree canopy loss and improve tree health.**

OBJECTIVE  
11.

**Maintain and improve parks and open spaces.**



OBJECTIVE  
10.

## Prevent tree canopy loss and improve tree health

Shoreline is fortunate to have an abundance of beautiful natural landscapes and forests. Protection of the existing tree canopy will ensure that future generations of Shoreline residents can enjoy the same shade, clean air, and aesthetic beauty that today's residents enjoy.

### What Shoreline is doing to prevent tree canopy loss and improve tree health

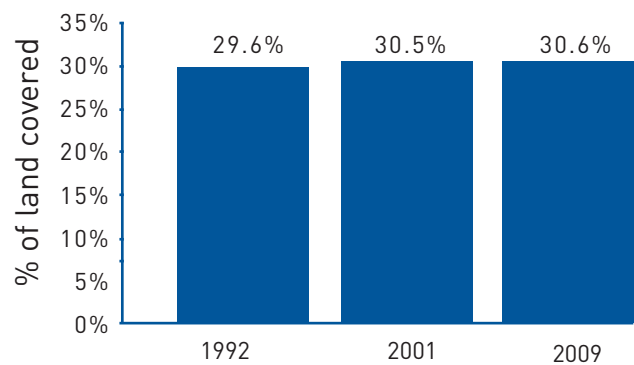
#### Urban Tree Canopy Assessment

A key objective in the Shoreline City Council's 2011-2012 goals was to update the City's tree regulations. To achieve this task, the City contracted with MEC Earth & Environmental to establish a tree canopy baseline for the City. The results of the 2011 inventory showed that Shoreline has successfully maintained an impressive tree canopy cover in the city for over two decades. Tree canopies have covered 31 percent of the city's land since 2001, compared to Seattle's tree canopy cover of 23 percent. This communitywide urban forest in Shoreline sequesters carbon, reducing our greenhouse gas emissions. Not only did the inventory support the City's 2012 tree regulation updates, it allowed the City to identify further opportunities for supporting Shoreline's urban trees. Since health of the understory is also important to the ecosystem as a whole, the City has launched pilot projects to study soil acidity and enhance growth in these areas.

#### Revisions to the tree code to promote tree retention and health

On June 18, 2012, the Shoreline City Council passed Ordinance 640 to amend the existing tree regulations with more stringent requirements for protection and preservation of trees during development. Under the ordinance, all proposed development activities must meet minimum requirements for tree cover retention and protection. The ordinance stipulates a variety of tree-friendly site design requirements, such as the protection of trees within vegetated islands and stands rather than as individual, isolated trees scattered throughout the site.

Figure 12. Shoreline Urban Tree Canopy



#### Establishment of Tree Board

Shoreline's Tree Board provides a single point of leadership and expertise for development and implementation of the City's urban tree policies and objectives. Established in 2012, the Tree Board oversees the policies that govern planting, pruning, and removal of public trees, works with Shoreline City staff to convene the annual Arbor Day celebration, and educates residents on the value and proper care of trees in the Shoreline community.

#### Shoreline: Tree City USA

In 2013, the City of Shoreline was formally recognized for its leadership in urban forestry and natural resource stewardship through designation as a "Tree City USA" by the National Arbor Day foundation. This award demonstrates Shoreline's commitment to enhancing and preserving the City's extensive network of urban forests. Activities that will contribute to achieving this notable distinction include the development of an Urban Forest Strategy Plan, an updated tree inventory, and tree planting projects.



## Recommendations for Further Action

### 10A **Maintain the health of trees planted in public parks, open spaces, and street right-of-ways.**

Proper maintenance and care for these trees present an even greater challenge. To ensure continued health and growth of Shoreline's trees, the City should pursue opportunities to improve its current tree maintenance program. One option would be to support public engagement strategies, such as through habitat restoration projects for volunteers and through the City's mini-grant programs.

### 10B **Seek funds to hire an Urban Forester and tree maintenance staff to oversee public forest stewardship and coordinate community volunteers.**

Establishment of the Shoreline Tree Board marked an important step towards supporting urban forest best management practices. The City could further boost the capacities and activities of this Board through appointment of a City Urban Forester, who could provide expertise and guidance to the citizen-led group and Parks maintenance staff.



### 10C **Continue collaboration with our community partners to prioritize tree preservation and replacement citywide.**

With the adoption of Ordinance 617 and 627, sustainable management of the City's public trees has been identified as a core priority for the City.

### 10D **Provide education to residents on the importance of tree preservation, planting, and care, and the removal of invasive species.**

Since the majority of Shoreline's trees are on private property, engaging the community is vital for meeting the City's tree canopy goals. New programs or campaigns that educate and engage the community can be an effective way to encourage beneficial tree care and maintenance among private property owners.





## What You Can Do

Over 70 percent of Shoreline's tree canopy is found in low-density residential neighborhoods. Actions you take at home to plant and care for trees on your property play a major role in keeping Shoreline a Tree City USA. Here are some tips for maintaining the health and abundance of trees throughout Shoreline.



### Care for trees on your property.

Just like any living thing, trees require a little care. Take time on a nice day to water, prune, weed, and mulch the trees on your property.

### Plant a new tree.

Every newly planted tree increases Shoreline's urban tree canopy cover and contributes towards cleaning the air, protecting our climate, creating habitat for wildlife, and reducing stormwater flows. Trees provide great aesthetic beauty during spring blooms; enhance the privacy of your home; and help cool your home, patio, or yard on hot summer days.



## Maintain and improve parks and open spaces

The City's parks and open spaces are sanctuaries where the public can meet, play, and enjoy the natural bounty of the region. Since most parks and open spaces are publically owned, the City plays a major role in keeping these spaces productive, healthy, and enjoyable.

### What Shoreline is doing to maintain and improve parks and open spaces

#### Habitat restoration at local parks

The City has integrated proper maintenance and improvement of parks and open spaces across the City's many planning processes. The Parks, Recreation, and Open Spaces (PROS) Plan outlines goals and policies for developing and maintaining the City's parks and recreational facilities. The City's updated Transportation, Parks, and Surface Water Master Plans identify opportunities to utilize City park and right-of-way property for pedestrian/bike facilities, natural drainage solutions, community gardens, and habitat restoration. The Surface Water Master Plan contains recommendations for improving stream, wetland, and stormwater retention areas, such as through "GreenWorks," one of the City's low impact development program.



#### Removal of invasive species

Invasive species threaten the health and beauty of Shoreline's natural ecosystems. Since 2012, the City has enlisted the help of goats, llamas, and sheep to manage vegetation, including invasive species in and around several City surface water facilities. During the spring and summer growing season when the animals are used, an outside contractor is responsible for the care and well-being of the animals. A shepherd is on-site, full-time for larger areas and part-time in fully fenced smaller areas. Since the goats and similar animals create a lower environmental impact, while keeping costs under control, the City anticipates their continued use in the future.



In addition, the City supports and organizes volunteer work parties where dedicated Shoreline volunteers remove invasive species, replant native species, and help to maintain the City's parks. The City's environmental mini-grants often contribute to materials and plants for these and other habitat restoration projects.



## Recommendations for Further Action

### **11A Identify opportunities for habitat improvements to reduce the urban heat island effect and support carbon sequestration in City open spaces.**

Ensuring that Shoreline’s public park lands and other property are utilized to their highest potential makes sense for climate protection and as a long-term community investment. By identifying open spaces and properties that have potential for improvement, the City can increase tree cover or vegetation, enhance habitat, and maximize potential green space, as was accomplished during the construction of the City Hall. Through its Heat Island Program, the U.S. EPA has developed a [toolkit](#) for local governments looking for ideas about how to maximize the potential climate benefits on public lands.



### **11B Continue to provide environmental mini-grants that support community efforts to establish or enhance natural habitat on private lands.**

Shoreline’s environmental mini-grant program has been a great success. By funding projects that promote management and stewardship of Shoreline’s natural resources and environmental assets, the grants provide a mutual public benefit to the environment and the community by improving habitat, reducing greenhouse gas emissions, building social capital, and giving Shoreline residents a sense of pride and place. Continuing to promote this valuable use of public dollars would create a win-win-win scenario for the City, the Shoreline community, and the natural environment.



## What You Can Do

Whether you live in a house, apartment, or condominium, you can help make Shoreline an inviting, thriving habitat for some of the Northwest's most unique and precious plants and wildlife. Here are ways you can enhance the natural spaces you and your neighbors share and enjoy.



### Participate in community green space improvement projects.

Join your neighbors for a fun and productive day of restoration! The City organizes restoration work parties throughout the year where you and other volunteers can help remove invasive plants, plant native species, and beautify the landscape. Visit the [calendar](#) on the City website for information about upcoming habitat restoration parties and projects.



### Join a community garden, or support efforts to establish a new garden in your yard or neighborhood.

Gardens are havens for diverse bird, insect, and plant life. The Shoreline Twin Ponds Park Community Garden offers year-round opportunities for residents to get their hands into the soil in support of these local habitats. Watch for opportunities to join a community garden, participate in work parties, learn gardening tips, or celebrate the locally grown harvest at the City's Farmer's Market, described in Shoreline's Currents articles or at the City's Community Garden webpage. Interested in establishing a new garden, but have no space? Residents can plant vegetables and other plants in the City right-of-way by filling out a Notice of Planting in the Right-of-Way form, available at the City's Right-of-Way and Construction Inspection Services webpage.



### Consider installing a green roof on your home, business, or other structure.

Green roofs provide wildlife habitat, remove greenhouse gases from the atmosphere, moderate water flows during storm events, and reduce heating in summer and cooling in winter. Green roofs can also increase the longevity of underlying roofing materials, resulting in a life cycle cost that is competitive with conventional roofing materials. Consider installing a green roof on your home, business, garage or shed. You would not be alone. Over a third of all green roofs in Seattle are small (300-1,500 square foot) projects found on private residential homes. To see a local example, visit Shoreline City Hall's green roof.



# Conclusion



View from space of a sunrise with the Earth below and the troposphere above.

Carl Sagan, a renowned astronomer, described our troposphere, where our weather occurs, as being only the thickness of varnish compared to the thickness of the Earth itself. Our atmosphere is indeed vulnerable to the vast amounts of pollution we emit. Although the Earth has an astounding capacity to rebound from change and catastrophe, the pace and scale of our human-created climate change threaten global stability and the ability of future generations to prosper and thrive. Climate change must be addressed comprehensively and immediately.



This photo, titled Earth Rise, was taken by astronaut Bill Anders from the moon during the Apollo 8 mission on December 22, 1968. The photo was the first to show Earth from this perspective.

This fragile and finite blue dot is our home, with all of its geologic turbulence, astounding animals and human drama that has brought us over billions of years to our current situation. If humans around the world can be inspired by the same ambition and innovation that enabled us to reach the moon in a seemingly impossible timeframe, our descendants can inherit an Earth that continues to have resilient systems; a stunning abundance of plants, animals, and natural environments; and resources to sustain and enhance our human quality of life.

This Climate Action Plan represents one city's effort to create a future for all its inhabitants that is sustainable in all respects and in perpetuity. We hope that you will join us in bringing this vision to reality.

# Glossary

**Carbon footprint** – the total amount of greenhouse gas emissions attributed to the activities of a single entity, such as an individual, organization, or jurisdiction.

**Carbon sequestration** – the capture, storage, and separation of atmospheric carbon dioxide from the atmosphere. Typically refers to storage in a capture-and-storage facility (CCS), in soils, or in living plant tissue. It is sometimes referred to as a “carbon sink.”

**Celsius** – the most common unit of temperature used in climate change science (abbreviated “C”). Celsius degrees are larger intervals than Fahrenheit degrees, e.g. a 1.0-degree Celsius increase in temperature is equivalent to a 1.8-degree Fahrenheit increase.

**Climate** – the average weather for a particular region over a long period of time. One way of remembering the difference between weather and climate is that ‘climate’ is what you expect (e.g. cool, wet winters) and ‘weather’ is what you get (e.g. a sunny day).

**Diversion of solid waste**– the proportion of disposed waste that is recycled, composted, or by other means directed away from the landfill.

**Greenhouse gas** – any gas in the atmosphere that absorbs solar radiation from the Earth’s surface and releases that radiation as heat energy back to Earth.

**Low Impact Development (LID)** – a stormwater and land use management strategy that strives to mimic natural hydrologic processes through the use of trees, bioretention, permeable pavements, green roofs, and rainwater harvesting.

**mtCO<sub>2</sub>e** – metric tons of carbon dioxide equivalent greenhouse gases; a unit of measure that allows for aggregation of different greenhouse gases, such as nitrous oxide (N<sub>2</sub>O), methane (CH<sub>4</sub>), and carbon dioxide (CO<sub>2</sub>), into a single comparable measurement.

**MWh** – megawatt-hour; a unit of energy that is equivalent to 1,000 kilowatt-hours.

**Organics** – any material that can be composted at commercial facilities, such as food scraps, compostable containers, yard waste, and food-soiled paper.

**SOV** – single occupancy vehicle; a vehicle whose only occupant is the driver.

**Urban Heat Island** - a built area, such as a city, that is hotter than an adjacent rural area.

**Weather** – atmospheric conditions over a short period of time.

# Endnotes

1. Stockholm Environmental Institute U.S. (SEI-US), *Identifying High Priority Household Behaviors*. Memo prepared for the King County Community GHG Emissions Inventories and Measurement Framework Project, October 31, 2011 (DRAFT).
2. U.S. EPA, "Greenhouse Gas Equivalencies Calculator: Calculations and References." Available online at: <http://www.epa.gov/cleanenergy/energy-resources/calculator.html>.
3. See Shoreline Climate Action Plan Appendix B: 2012 Greenhouse Gas Emissions Inventory Report.
4. Union of Concerned Scientists, "Ten Personal Solutions to Global Warming." Available online at: [http://www.ucsusa.org/testfolder/global-warming/what\\_you\\_can\\_do/ten-personal-solutions-to.html](http://www.ucsusa.org/testfolder/global-warming/what_you_can_do/ten-personal-solutions-to.html).
5. Food and Agriculture Organization of the United Nations, *Livestock's Long Shadow*. Rome, 2006.
6. Bloom, J. *American Wasteland*. De capo Press, 2010.
7. Gillis, J. "Heat-Trapping Gas Passes Milestone, Raising Fears." *The New York Times*, May 10, 2013.
8. King County. *King County Environmental Impacts of Climate Change, March 21, 2013*. Retrieved June 3, 2013.
9. Ibid.
10. Climate Impacts Group at the University of Washington. *The Washington Climate Change Impacts Assessment, July 2007*. Retrieved June 3, 2013.
11. King County. *King County Environmental Impacts of Climate Change, March 21, 2013*. Retrieved June 3, 2013.
12. Berwyn, B. "Research suggests climate change impacts to Puget Sound." *Summit Voice*, September 9, 2012.
13. Dolan, M. "Are Oysters Doomed?" *Slate.com*, February 18, 2013.
14. International Panel on Climate Change. "Impacts on Systems and Sectors." *Climate Change 2007: Synthesis Report, Section 3.3.1*. 2007.
15. King County-Cities Climate Collaboration, *Developing a Regional Greenhouse Gas Emissions Reduction Target & Measurement Framework, May 24, 2013 (DRAFT)*.
16. International Panel on Climate Change. "Emissions Trajectories for Stabilisation." *Climate Change 2007: Synthesis Report, Section 5.4, Table 5.1*. 2007.
17. United Nations Human Settlements Programme. *Cities and Climate Change: Global Report on Human Settlements*. Earthscan. 2011.
18. City of Shoreline, 2012 Shoreline Telephone Survey, Question 1 Results.
19. "MWh" stands for "megawatt-hour," a unit of energy. One megawatt-hour is equivalent to 1,000 kilowatt-hours. The abbreviation "mtCO<sub>2</sub>e" stands for "metric tons of carbon dioxide-equivalents." It is a unit that is commonly used to measure greenhouse gas emissions.
20. Personal interview with Kellie Stickney, SustainableWorks Director of Marketing and Outreach, February 13, 2013.
21. Electricity cost savings estimate assumes average electricity cost of \$0.05/kWh and a life span of 25,000 hours.

## Endnotes

22. US EPA, ENERGY STAR Portfolio Manager. Retrieved April 2013, from ENERGY STAR Web site: [http://www.energystar.gov/index.cfm?c=evaluate\\_performance.bus\\_portfoliomanager\\_carbon](http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager_carbon).
23. City of Seattle. (2013). *Solar Demonstration Projects*. Retrieved April 2013, from Seattle City Light Green Power Program Web site: <http://www.seattle.gov/light/green/greenpower/accomplish.asp>.
24. City of Seattle. (2013). *Solar Project - Shoreline City Hall*. Retrieved April 2013, from Seattle City Light Green Power Web site: <http://www.seattle.gov/light/Green/greenPower/Accomplishments/shorelineChall.asp>.
25. Preservation Green Lab. (2010). *The Role of District Energy in Greening Existing Neighborhoods*. National Trust for Historic Preservation. Retrieved April 2013, from <http://www.preservationnation.org/information-center/sustainable-communities/green-lab/additional-resources/District-Energy-Long-Paper.pdf>.
26. Percentage reduction depends on existing toilet efficiencies. Older toilets can use from 1.6 to 3.5 gallons per flush, and newer toilets can use from 1.1 to 1.28 gallons per flush.
27. King County Solid Waste Division, Organics Characterization Report. Prepared by Cascadia Consulting Group, June 2012. <http://your.kingcounty.gov/solidwaste/garbage-recycling/documents/Organics-Characterization-report-2012.pdf>.
28. Portland Bureau of Planning and Sustainability, *New Curbside Collection Service: Year One Report*. December 2012.
29. [http://seattletimes.com/html/ecoconsumer/2018192489\\_ecoconsumer19m.html](http://seattletimes.com/html/ecoconsumer/2018192489_ecoconsumer19m.html).
30. Cascadia Consulting Group, *2011 King County Waste Characterization and Customer Survey Report*. Prepared for the King County Department of Natural Resources and Parks – Solid Waste Division, October 2012.
31. <http://www.stopwaste.org/docs/fact-paper.pdf>.
32. <http://www.newdream.org/resources/2011-05-start-a-tool-library-in-your-community>.
33. US Environmental Protection Agency. (2013). *Transportation Sector Emissions*. Retrieved April 2013, from US ENVIRONMENTAL PROTECTION AGENCY Greenhouse Gas Emissions Web site: <http://www.epa.gov/climatechange/ghgemissions/sources/transportation.html>.
34. US Environmental Protection Agency. (2013, April 25). *Greenhouse Gas Equivalencies Calculator*. Retrieved May 2013, from US ENVIRONMENTAL PROTECTION AGENCY Clean Energy Web site: <http://www.epa.gov/cleanenergy/energy-resources/calculator.html#results>.
35. Carrico, A. R., Padgett, P., Vandenbergh, M. P., Gilligan, J., & Wallston, K. A. (2009, August). Costly myths: An analysis of idling beliefs and behavior in personal motor vehicles. *Energy Policy*, 37(8), 2881-2888. Retrieved April 2013, from <http://www.sciencedirect.com/science/article/pii/S0301421509001633>.
36. As compared to the observed fuel efficiencies of similar sedans in the City of Shoreline fleet.
37. Vedder, T. (2013, February 22). Renton residents trying to solve mystery of disappearing birds. *Komonews.com*. Retrieved May 2013, from <http://www.komonews.com/news/local/Renton-residents-trying-to-solve-mystery-of-disappearing-birds-192619811.html>.
38. Puget Sound Clean Air Agency. (2012). *Certification*. Retrieved 2013, from Evergreen Fleets Web site: <http://www.evergreenfleets.org/Certification/tabid/56/Default.aspx>.



## Endnotes

39. US Department of Energy. (2013). *Keeping Your Car in Shape*. Retrieved May 2013, from <http://www.fueleconomy.gov/feg/maintain.shtml>.
40. Hodges, T. (2010). *Public Transportation's Role in Responding to Climate Change*. US Department of Transportation, Federal Transit Administration. Retrieved May 2013, from <http://www.fta.dot.gov/documents/PublicTransportationsRoleInRespondingToClimateChange2010.pdf>.
41. Taken directly from the Transportation Master Plan.
42. Nowak, D. J., Greenfield, E. J., Hoehn, R. E., & Lapoint, E. (2013). Carbon storage and sequestration by trees in urban and community areas of the United States. *Environmental Pollution*, 229-236.

# References and Web Links

## References

- Allen, M. (2009, October 1). Obama's Call for Tire Inflation to Beat Gas Crunch: Reality Check. Retrieved 2013, from Popular Mechanics: <http://www.popularmechanics.com/cars/how-to/4276844>.
- Berwyn, B. (2012, September 9). Research suggests climate change impacts to Puget Sound. Retrieved from Summit Voice: <http://summitcountyvoice.com/2012/09/09/research-suggests-climate-change-impacts-to-puget-sound/>.
- Carrico, A. R., Padgett, P., Vandenberg, M. P., Gilligan, J., & Wallston, K. A. (2009). Costly myths: An analysis of idling beliefs and behavior in personal motor vehicles. *Energy Policy*, 37 (8), 2881-2888.
- City of Seattle. (2013). Solar Demonstration Projects. Retrieved April 2013, from Seattle City Light Green Power Program Web site: <http://www.seattle.gov/light/green/greenpower/accomplish.asp>.
- City of Seattle. (2013). Solar Project - Shoreline City Hall. Retrieved April 2013, from Seattle City Light Green Power Web site: <http://www.seattle.gov/light/Green/greenPower/Accomplishments/shorelineChall.asp>.
- Climate Impacts Group at the University of Washington. (2007, July). The Washington Climate Change Impacts Assessment. Retrieved from Climate Impacts Group Web Site: <http://cses.washington.edu/cig/res/ia/waccia.shtml>.
- Dolan, M. (2013, February 18). Are Oysters Doomed? Slate.com.
- Hodges, T. (2010). Public Transportation's Role in Responding to Climate Change. US Department of Transportation, Federal Transit Administration.
- King County. (2013, March 21). King County Environmental Impacts of Climate Change. Retrieved from King County: Climate Change: <http://www.kingcounty.gov/environment/climate/climate-change-resources/impacts-of-climate-change/environmental-impacts.aspx>.
- Nowak, D. J., Greenfield, E. J., Hoehn, R. E., & Lapoint, E. (2013). Carbon storage and sequestration by trees in urban and community areas of the United States. *Environmental Pollution*, 229-236.
- Preservation Green Lab. (2010). The Role of District Energy in Greening Existing Neighborhoods. National Trust for Historic Preservation.
- Puget Sound Clean Air Agency. (2012). Certification. Retrieved 2013, from Evergreen Fleets Web site: <http://www.evergreenfleets.org/Certification/tabid/56/Default.aspx>.
- Raucher, R. S. (2006). An Economic Framework for Evaluating the Benefits and Costs of Water Reuse. Stratus Consulting. Alexandria, VA: WateReuse Foundation.

# References and Web Links

Seattle Public Utilities. (2010). An Economic Analysis of the North Seattle Reclaimed Water Project. Seattle, WA.

United Nations Human Settlements Programme. (2011). Cities and Climate Change: Global Report on Human Settlements. Earthscan.

US Department of Energy. (2013). Keeping Your Car in Shape. Retrieved May 2013, from [www.fueleconomy.gov](http://www.fueleconomy.gov): <http://www.fueleconomy.gov/feg/maintain.shtml>.

US Environmental Protection Agency. (2013, April 25). Greenhouse Gas Equivalencies Calculator. Retrieved May 2013, from US EPA Clean Energy Web site: <http://www.epa.gov/cleanenergy/energy-resources/calculator.html#results>.

US EPA. (n.d.). ENERGY STAR Portfolio Manager. Retrieved April 2013, from ENERGY STAR Web site: [http://www.energystar.gov/index.cfm?c=evaluate\\_performance.bus\\_portfoliomanager\\_carbon](http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager_carbon).

US EPA. (2013). Transportation Sector Emissions. Retrieved April 2013, from US EPA Greenhouse Gas Emissions Web site: <http://www.epa.gov/climatechange/ghgemissions/sources/transportation.html>.

Vedder, T. (2013, February 22). Renton residents trying to solve mystery of disappearing birds. [Komonews.com](http://www.komonews.com).

## Web Links

### **2012 Greenhouse Gas Emissions Inventory and Emissions Reduction Goals**

<http://coolclimate.berkeley.edu/carboncalculator>

<http://coolersmarter.org/>

<http://www.kingcounty.gov/environment/climate/climate-change-resources/impacts-of-climate-change/environmental-impacts.aspx>

### **Energy and Water**

Energy Star: [www.energystar.gov](http://www.energystar.gov)

SustainableWorks home energy audit sign-up: <http://sustainableworks.com/sign-up/>

Shoreline PV online dashboard: <http://view2.fatspaniel.net/PV2Web/merge?view=PV/standard/Simple&eid=514674>

# References and Web Links

Videos from the Comprehensive Plan Update Speaker Series:

[http://shoreline.granicus.com/MediaPlayer.php?view\\_id=5&clip\\_id=410](http://shoreline.granicus.com/MediaPlayer.php?view_id=5&clip_id=410)

[http://shoreline.granicus.com/MediaPlayer.php?view\\_id=5&clip\\_id=434](http://shoreline.granicus.com/MediaPlayer.php?view_id=5&clip_id=434)

Preservation Green Lab, The Role of District Energy in Greening Existing Neighborhoods: <http://www.preservationnation.org/information-center/sustainable-communities/green-lab/additional-resources/District-Energy-Long-Paper.pdf>

Seattle City Light, Guide to Installing Solar Electric System:

[http://www.seattle.gov/light/conserves/cgen/docs/SCL\\_ElectricSolarGuide.pdf](http://www.seattle.gov/light/conserves/cgen/docs/SCL_ElectricSolarGuide.pdf)

Washington Department of Health's Greywater Reuse: <http://www.doh.wa.gov/CommunityandEnvironment/WastewaterManagement/GreywaterReuse.aspx>

Wateruse Foundation, Economic Framework for Evaluating the Benefits and Costs of Water Reuse: [http://your.kingcounty.gov/dnrp/library/wastewater/rw/CompPlan/03-006\\_Exec\\_Summary.pdf](http://your.kingcounty.gov/dnrp/library/wastewater/rw/CompPlan/03-006_Exec_Summary.pdf)

North Carolina Department of Natural Resources, Water Efficiency Education and Outreach Program Toolkit: [http://portal.ncdenr.org/c/document\\_library/get\\_file?uuid=fe46de27-57a0-43fd-bdc1-4371b87b6ee7&groupId=38322](http://portal.ncdenr.org/c/document_library/get_file?uuid=fe46de27-57a0-43fd-bdc1-4371b87b6ee7&groupId=38322)

King County Native Plant Guide: <http://green.kingcounty.gov/GoNative>

## **Materials and Waste**

West Seattle Fixers' Collective: <http://wsfixers.org/>

King County "What Do I Do With...?" website: <http://your.kingcounty.gov/solidwaste/wdidw>

Repair Café Foundation, How to start a repair café:

<http://www.resilience.org/stories/2013-04-02/how-to-start-a-repair-cafe>

Diggin' Shoreline: <http://www.digginshoreline.org/>

Shoreline Farmers Market: <http://www.shorelinefarmersmarket.org/>

Electronic Product Environmental Assessment Tool (EPEAT): <http://www.epeat.net/>

King County Linkup: <http://your.kingcounty.gov/solidwaste/linkup/shingles/index.asp>

Food – Too Good to Waste Toolkit: [ftp://ftp.epa.gov/reg10ftp/Food\\_Too\\_Good\\_To\\_Waste/](ftp://ftp.epa.gov/reg10ftp/Food_Too_Good_To_Waste/)

West Seattle Tool Library: <http://wstoollibrary.org/>

Relay Rides: <https://relayrides.com/>

SWEL Timebank: <http://www.sweltimebank.org/>

# References and Web Links

## **Transportation, Land Use, and Mobility**

U.S. Department of Energy Fuel Economy Information: [www.fueleconomy.gov](http://www.fueleconomy.gov)

Shoreline Walks: <http://www.shorelinewa.gov/index.aspx?page=982>

WA Department of Transportation, Rideshareonline.com: <http://www.rideshareonline.com/>

King County InMotion: <http://www.kingcounty.gov/transportation/kcdot/MetroTransit/InMotion.aspx>

Walking School Bus: [www.walkingschoolbus.org](http://www.walkingschoolbus.org)

## **Urban Trees, Parks, and Green Spaces**

City of Portland, Tree Inventory Project: <http://www.portlandoregon.gov/parks/53181>

City of Seattle, reLeaf Planting and Care: [www.seattle.gov/trees](http://www.seattle.gov/trees)

City of Seattle, Tree Planting: [www.seattle.gov/trees/planting](http://www.seattle.gov/trees/planting)

U.S. EPA, Urban Heat Island Program Toolkit: <http://www.epa.gov/heatisland/resources/compendium.htm>

# Appendix A: Shoreline Climate Action Objectives and Recommendations (Rec.)

## Greenhouse Gas Emissions Reduction Goals

- Reduce communitywide greenhouse gas emissions by at least 25% below 2007 levels by 2020, 50% by 2030, and 80% by 2050.
- Achieve zero net greenhouse gas emissions from government operations by 2030.

## Energy And Water

OBJECTIVE  
1.

### Reduce energy consumption

- Rec. 1-A: Work with Seattle City Light to continue converting streetlights to LEDs.
- Rec. 1-B: Make efficiency upgrades to Shoreline Pool facility to reduce energy use and lower operating costs as funding allows.
- Rec. 1-C: Incorporate energy efficiency into upgrades of City facilities to meet ENERGY STAR building performance standards for similar building types. *(Modified from Environmental Sustainability Strategy (ESS) Rec-12)*
- Rec. 1-D: Incorporate energy efficiency best practices into new City buildings and consider seeking green building certifications such as LEED or ENERGY STAR for new construction projects. *(Modified from ESS Rec-10)*
- Rec. 1-E: Expand the City's Environmentally Preferable Purchasing Guidelines to include additional products that increase energy efficiency. *(Modified from ESS Rec-13)*
- Rec. 1-F: Promote the use of Seattle City Light and Puget Sound Energy (PSE) incentives for energy conservation. *(Modified from ESS Rec-17)*
- Rec. 1-G: Promote high-performance building and energy efficiency in private construction and remodeling through education and code development. *(Modified from ESS Rec-22)*

OBJECTIVE  
2.

### Increase renewable energy production and use

- Rec. 2-A: Increase City green power purchases through Seattle City Light's Green Up program. *(Modified from ESS Rec-14)*
- Rec. 2-B: Streamline permitting for solar photovoltaic (PV) installations.
- Rec. 2-C: Through Environmental Services outreach and technical assistance, promote installation of renewable energy systems, and continue to support programs such as the Shoreline Solar Project.

# Appendix A: Shoreline Climate Action Objectives and Recommendations (Rec.)

Rec. 2-D: Explore the feasibility of launching a “Solarize Shoreline” bulk-purchasing program of solar PV systems in coordination with NW SEED.

Rec. 2-E: Investigate the feasibility of development of district energy system(s) within the city.

## OBJECTIVE 3.

### Reduce water consumption

Rec. 3-A: Assess potential replacement of fixtures and equipment in high-use operations in all City facilities with high-efficiency options. *(Modified from ESS Rec-41)*

Rec. 3-B: Investigate the opportunities for rainwater harvesting and greywater reuse at existing and new City facilities and open spaces. *(Modified from ESS Rec-43)*

Rec. 3-C: Through the new water utility, consider rate structures or incentives for customers to encourage water conservation.

Rec. 3-D: Promote water conservation through outreach and communications to Shoreline residents and businesses.

## Materials And Waste

## OBJECTIVE 4.

### Increase recycling and reuse to reduce solid waste sent to the landfill

Rec. 4-A: Continue to expand recycling and organics collection services at City facilities and open spaces. *(ESS Rec-37)*

Rec. 4-B: Establish space with large containers to collect and recycle yard debris from Public Works and Parks operations at Hamlin Yard and Brugger’s Bog.

Rec. 4-C: Implement construction and demolition (C&D) waste reduction outreach and incentives through the permitting process. *(ESS Rec-40)*

Rec. 4-D: Promote and encourage food scraps and yard debris recycling by residents and businesses through current education programs and the development of a new rate structure in the solid waste contract.

Rec. 4-E: Consider shifting to every-other-week garbage collection and weekly organics collection.

Rec. 4-F: Consider establishing a recycling store that offers reusable items and products made from recycled materials.

Rec. 4-G: Intensify collaboration and outreach with second-hand stores and King County to promote textile collection and recycling.

# Appendix A: Shoreline Climate Action Objectives and Recommendations (Rec.)

- Rec. 4-H: Support and promote efforts to extend the useful life of products through repair and reuse.
- Rec. 4-I: Encourage the use of recyclable products for take-out food containers and utensils in food-service businesses.

## OBJECTIVE 5.

### **Reduce GHG emissions embodied in materials and food consumed**

- Rec. 5-A: Increase percentage of recycled content in paper to 100% for color copies when possible.
- Rec. 5-B: Select new electronics that meet Electronic Product Environmental Assessment Tool (EPEAT) standards and consider becoming an EPEAT purchasing partner when possible.
- Rec. 5-C: Investigate the use of recycled asphalt shingles (RAS) or other recycled products in asphalt used for City paving projects.
- Rec. 5-D: Consider seeking grant funds to launch a “Food: Too Good to Waste” campaign (supported by EPA) to encourage food waste reduction by residents.
- Rec. 5-E: Promote the use of the City’s mini-grant programs to support “collaborative consumption” community projects like tool libraries and repair cafes.

## Transportation, Land Use, And Mobility

## OBJECTIVE 6.

### **Reduce fossil fuel consumption by vehicles**

- Rec. 6-A: Continue investing in more efficient fleet vehicles.
- Rec. 6-B: Support community installation of electric charging stations.
- Rec. 6-C: As part of the new water utility, consider installation of “smart” water meters to reduce the vehicle miles required for utility staff to read meters.
- Rec. 6-D: Consider participation in the Evergreen Fleets program to reduce the use of petroleum and support clean air.

## OBJECTIVE 7.

### **Reduce use of single occupancy vehicles**

- Rec. 7-A: Expand the Commute Trip Reduction program and support services to include medium size employers. *(ESS Rec-35)*
- Rec. 7-B: Continue to encourage a decrease in Single Occupancy Vehicle commuting by City employees.
- Rec. 7-C: Consider establishing a car sharing program, such as Zipcar, at City Hall for use by City employees and Shoreline residents.



# Appendix A: Shoreline Climate Action Objectives and Recommendations (Rec.)

OBJECTIVE  
8.

## **Increase convenience and safety of alternative transportation**

Rec. 8-A: Use environmental mini-grants, City communications, and other tools to encourage community efforts to shift to alternative modes of transportation.

OBJECTIVE  
9.

## **Concentrate new growth in proximity of services and transit**

Rec. 9-A: Utilize zoning and permitting methods to concentrate new growth in proximity of services and transit. *(ESS Obj-8)*

## **Urban Trees, Parks, And Open Spaces**

OBJECTIVE  
10.

### **Prevent tree canopy loss and improve tree health**

Rec. 10-A: Maintain the health of trees planted in public parks, open spaces, and street right-of-ways.

Rec. 10-B: Seek funds to hire an Urban Forester and tree maintenance staff to oversee public forest stewardship and coordinate community volunteers.

Rec. 10-C: Continue collaboration with our community partners to prioritize tree preservation and replacement citywide.

Rec. 10-D: Provide education to residents on importance of tree preservation, planting, and care, and the removal of invasive species.

OBJECTIVE  
11.

### **Maintain and improve parks and open spaces**

Rec. 11-A: Identify opportunities for habitat improvements to reduce the urban heat island effect and support carbon sequestration in City open spaces.

Rec. 11-B: Continue to provide environmental mini-grants that support community efforts to establish or enhance natural habitat on private land.