

# CITY OF BELLEVUE

ENVIRONMENTAL  
STEWARDSHIP INITIATIVE

STRATEGIC PLAN

2013-2018



Environmental  
Stewardship  
Initiative





# CITY OF BELLEVUE

## ENVIRONMENTAL STEWARDSHIP INITIATIVE STRATEGIC PLAN 2013-2018

### Contents

4	Introduction
6	Leadership Endorsement
7	Acknowledgements
10	Report Overview
11	Key Performance Indicators
12	Greenhouse Gas Emissions
20	Mobility & Land Use
34	Energy & Water
48	Materials Management & Waste
58	Ecosystems & Open Spaces
71	Endnotes
76	Appendices
A-1	Appendix A: Project Portfolio

**Note:** Supplemental Document: Greenhouse Gas Emissions Inventory, 2011  
Available online at [www.bellevuewa.gov/environmental.htm](http://www.bellevuewa.gov/environmental.htm)



# INTRODUCTION





The City of Bellevue is surrounded by wetlands, trails, parks, and urban forests and has long been known as the “City in a Park.” Located between the shores of Lake Washington and Lake Sammamish, the City provides a key habitat corridor between the Puget Sound waterways and the Cascade mountain range. Bellevue’s natural environment is unique and particularly treasured for being woven into the fabric of a vibrant metropolitan city – existing among gleaming skyscrapers, inviting shops, and diverse cultural attractions. As an economic engine of the Eastside, Bellevue is home to global technology firms and other industry leaders, attracting a large daytime workforce from throughout the region. Bellevue’s leaders are aware that the community’s continued attractiveness as a place to “live, work, and play” depends on preserving and enhancing the natural assets of the community while simultaneously nurturing economic growth and social vibrancy. We recognize that the benefits of environmental stewardship reach deep and wide into the community, far beyond those related to maintaining healthier ecosystems. They include better human health and productivity, job creation, increased engagement by residents and businesses, monetary savings, and the creation and maintenance of resilient and sustainable communities.

In recognition of the multiple benefits of this work, Bellevue strengthened its commitment to sustainability and environmental stewardship in 2007 through the establishment of the Environmental Stewardship Initiative (ESI). The ESI leads innovative local and regional environmental efforts, and facilitates better environmental citizenship by the municipality as well as by resident and businesses. The City’s first city-wide environmental strategic plan, which covered the years 2009-2012, provided a cross-departmental framework for efforts aimed at minimizing the degradation of the community’s natural assets and reducing greenhouse gas emissions. As the period covered by that plan has come to an end, we are taking an opportunity to celebrate accomplishments, revise direction based on lessons learned, and create a roadmap for the future.

The ultimate goal of the ESI’s work is to create a sustainable city where citizens can enjoy the highest quality of life, work, and play and still deliver to future generations a community in which they can do the same. The purpose of this 2013-2018 Environmental Stewardship Report and Strategic Plan is to provide an organization-wide framework for working toward that goal together.

Thank you for your interest and support.

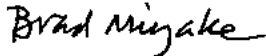
Sheida R. Sahandy  
Director of the Environmental Stewardship Initiative

*“Relentless and haphazard development has created a way of living that brings us to a point of reckoning regarding energy, climate change, and the way we shape our communities. The answer to these crises is sustainable development, a thoughtful combination of good urbanism with renewable energy sources, state-of-the-art conservation techniques, new green technologies, and integrated services and utilities.”*


*Urbanism in the Age of Climate Change*  
Peter Calthorpe


# DEPARTMENTAL LEADERSHIP ENDORSEMENT

The objectives set forth in this document align with the City of Bellevue Comprehensive Plan and are supported by the City's history, culture, and values. While most of the goals described here are not new, achieving them efficiently requires us to work together in new ways. It requires ongoing and active collaboration across departments and areas of expertise. It requires a more holistic and integrated way of understanding the community's well-being. It requires understanding the impacts of each action on a multitude of affected parties, including future generations. In acknowledgement of these facts, and to show support of the goals and vision set forth in this document, the Acting City Manager, and the Directors listed below hereby endorse this plan in 2013.


Brad Miyake,  
Acting City Manager 

Jan Hawn,  
Finance Director 


Myrna Basich,  
City Clerk & Assistant  
City Manager 

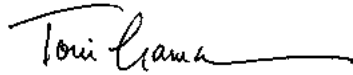
Nora Johnson,  
Civic Services Director 

David Berg,  
Transportation Director 

Navdeep Otal,  
Utilities Director 


Mike Brennan,  
Development  
Services Director 

Linda Pillo,  
Police Chief 

Toni Cramer,  
Information  
Technology Director 

Lori Riordan,  
City Attorney 

Michael Eisner,  
Fire Chief 

Chris Salomone,  
Planning & Community  
Development Director 

Patrick Foran,  
Parks & Community  
Services Director 

Kerry Sievers,  
Human  
Resources Director 

# ACKNOWLEDGEMENTS

The objectives, strategies, and indicators presented in this report were developed through collaboration with representatives of key City departments. Stakeholder meetings were held for each category, providing forums for discussion of past and current projects, new opportunities, barriers, and priorities for future action.

After a draft of the ESI Plan was developed, additional written and verbal feedback was collected from the Leadership Team and staff topic leads to further refine and revise the ESI Strategic Plan. Our special thanks go to the following people, who have contributed ideas, insight, data, or edits to this document.

## City of Bellevue

Paul Andersson*	Emil King	Todd Shepler
Rick Bailey	Tom Kuykendall	Tom Spille
Teresa Becker	Kevin LeClair	Liz Stead
Heidi Bedwell	Franz Loewenherz	Dan Stroh
Elaine Borjeson	Pam Maloney	Kam Szabo
Geoff Bradley	Kevin McDonald	Ian Toms
Melissa Brown	Tracy McMahan	Brian Ward
Patricia Burgess	Shelley McVein	Sean Wellander
Debbie Childers	Earl Meldahl	Mike Whiteaker
Judy Clark	Stela Nikolova	Brett Wilson
Laurie Devereaux	Julie Orta	
Dan DeWald	Camron Parker	
Stephanie Dompier	Kit Paulsen	
Susan Fife-Ferris	Michael Paine	
Lionel Forde	Dave Perry	
Karen Gonzalez	Shari Phillips	
Jennifer Goodhart	Chelo Picardal	
Pat Harris	Frank Pinney	
Ernie Henrie	Mark Poch	
Bill Heubach	Bobbi Pochman	
Paul Inghram	Sean Pownall	
Mike Ingram	David Pyle	
Claude Iosso	Randy Ransom	
Katie Jensen	Liz Rector	
Emma Johnson*	Julie Reznick	
Kate Johnson	Jamie Robinson	
Andrew Kidde	Gregg Schrader	

## Others

Sarah Bergmann, Cascadia Consulting  
Shannon Donnegan, Cascadia Consulting\*  
Jessica Geenan, PSE  
McKenna Morrigan, Cascadia Consulting\*  
Kris Overby, PSRC  
Michael Steinhoff, ICLEI

*Primary Authors\**

# COMMUNITY BENEFITS

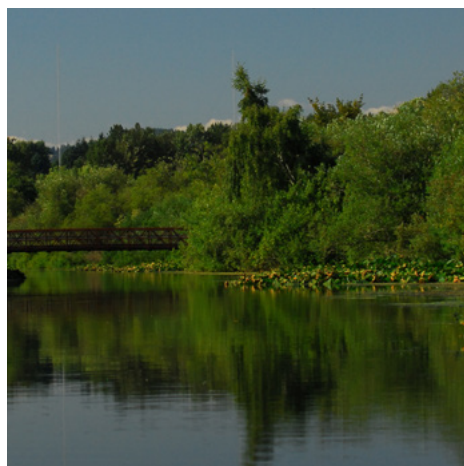
The benefits of environmental stewardship go well beyond environmental protection.

As the City of Bellevue advances cleaner technologies, cleaner economies, and healthier ecosystems, new jobs and industries, well-being, happiness, and human health will follow.



## Creating local jobs.

Many of the technologies, products and services required for the shift to a more sustainable future can be provided by companies located in Bellevue. Products and services may include home insulation, green building construction, energy monitoring software, recycled materials, lighting retrofits, solar panels, engineering, design and construction, water efficient landscaping, and sustainable transportation systems.



## Protecting and enhancing natural systems.

Healthy watersheds, tree canopy, rivers, streams, and wetlands can simultaneously reduce emissions, sequester carbon, and strengthen our ability to adapt to a changing climate. There are psychological benefits for residents who can access and enjoy nature within a few blocks of their home, as well as the economic benefit of attracting industries and highly skilled workers to locate in Bellevue.



## Enjoying livable, healthy communities.

Assets such as walkable and bikeable neighborhoods, local foods, and clean air help enable a population of healthy, active residents. Cities can help residents spend less time in traffic and less money on gas, providing more opportunities for socializing and contributing to quality communities.





### Engaging residents, businesses, and improving social equity.

Engaging residents and businesses can increase the creativity, accessibility, and potential of solutions to achieve meaningful sustainability. Green jobs, healthy local food, energy-efficient homes, and affordable and efficient transportation should and can be available to all residents.



### Developing resilience to changing economies and environments.

Climate change is already testing the resilience of transportation, energy, food, water, and other systems around the world. Dependence upon limited resources delivered through centralized systems and supply chains increases the risk to residents and businesses should these systems fail. Diversifying energy sources, transportation systems, and food supplies is the first step toward making cities more risk averse.



### Saving money and resources.

Using less energy in homes, buildings, and vehicles means lower energy and transportation bills for residents, businesses, and government. This keeps dollars in the hands of individuals, families, and local economies, increasing independence and stability.

# REPORT OVERVIEW

## Past, Present, and Future

The 2013-2018 ESI Strategic Plan highlights some of the City’s notable sustainability achievements from 2009 to 2012. A comprehensive listing of past and ongoing projects is available in Appendix A: Project Portfolio.






The impacts of ESI efforts have been measured by collecting and analyzing key performance indicators (KPIs). KPIs provide the information needed to understand the effectiveness of our efforts, to see the health of our environment at the time of measurement and, just as important, to discern trends over time. KPIs are the “report card” that grades our accomplishments, clarifies our present situation, and informs our decisions for future action.

The ESI objectives for the 2013-2018 period are the focus of this report. The overriding strategy for this next period is to leverage and build upon the foundations laid in the first plan by implementing projects at a larger scale, expanding upon successful pilot projects, and broadening engagement by residents and businesses throughout the community. ESI will also continue the strategy of serving as a leader and convener of regional efforts that allow all Eastside cities to achieve better outcomes than they could achieve alone.

## Organizational Structure of the Report

This report is organized into five categories. The categories are used as an organizing device, with the acknowledgment that some of the strategies and actions could conceivably fall in multiple categories. Each category includes a primary goal, broad strategies, and a list of detailed actions that are intended to achieve the stated goal. To the extent possible, the goals and actions are aligned with the City’s Comprehensive Plan and other regional, state, or federal frameworks. Key criteria used in developing the actions included impact, feasibility, and time frame. Progress toward goals is measured and verified with KPIs (see chart on next page).

The categories are:

-  Greenhouse Gas Emissions
-  Mobility & Land Use
-  Energy & Water
-  Materials Management & Waste
-  Ecosystems & Open Spaces

# KEY PERFORMANCE INDICATORS

## A Snapshot of Current Conditions



	KEY PERFORMANCE INDICATOR	TARGET	2011	% REDUCTION NEEDED	TREND SINCE 2006
<b>GREENHOUSE GAS EMISSIONS</b>					
M	Greenhouse gas emissions (MTCO <sub>2e</sub> )	11,246 <i>(7% below 1990 levels)</i>	14,511	22%	Improving
C	Greenhouse gas emissions (MTCO <sub>2e</sub> )	1,238,203 <i>(7% below 1990 levels)</i>	1,577,500	22%	Steady state
<b>MOBILITY &amp; LAND USE</b>					
M	Fleet GHG emissions (MTCO <sub>2e</sub> )	2,498 <i>(7% below 1990 levels)</i>	3,119	20%	Improving
C	Emissions from vehicle miles traveled (MTCO <sub>2e</sub> )	683,836 <i>(7% below 1990 levels)</i>	772,600	11%	Steady state
C	Commute trip reduction - Drive Alone Rate (%) at large employers	56.9% <i>(10% reduction in SOV commuters from 2007/2008)</i>	63.9%	11%	Mixed <i>(VMT decreasing, drive alone rate increasing)</i>
<b>ENERGY &amp; WATER</b>					
M	Emissions from kWh and therms consumed (MTCO <sub>2e</sub> )	5,444 <i>(7% below 1990 levels)</i>	9,969	45%	Improving
C	Emissions from kWh and therms consumed (MTCO <sub>2e</sub> )	610,736 <i>(7% below 1990 levels)</i>	873,600	30%	Mixed <i>(Increasing overall, decreasing per capita)</i>
M	Gallons of water used	Decrease <i>(10% reduction below floor space-weighted average (TBD) by 2015, reaching a 50% reduction by 2030)</i>	106,498		Mixed
C	Gallons of water saved per day	355,000 <i>(Cascade Water Alliance/ Bellevue Goals for 2013)</i>	566,453	37% <i>(exceeding target)</i>	Improving
C	Renewable energy installed in Bellevue (kW)	Increase	123		Improving
<b>MATERIALS MANAGEMENT &amp; WASTE</b>					
M	Emissions from landfilled solid waste (MTCO <sub>2e</sub> ) - excludes sequestration	117 <i>(7% below 1990 levels)</i>	96	22% <i>(exceeding target)</i>	Steady state
C	Emissions from landfilled solid waste (MTCO <sub>2e</sub> ) - excludes sequestration	7,578 <i>(7% below 1990 levels)</i>	8,200	7%	Improving
C	% of total waste recycled and composted	50.0% <i>(recycling rate for all contracted services)</i>	42.3%	18% <i>increase needed*</i>	Improving
<b>ECOSYSTEMS &amp; OPEN SPACES</b>					
C	Citywide tree cover (%)	40% <i>(American Forests' urban tree cover recommendation)</i>	36%	11% <i>increase needed*</i>	Declining <i>(20% cumulative loss since 1986, no data since 2006)</i>
C	Stream habitat	Improve			Mixed
C	Acres of open space and parks	Increase	2,551		Improving
C	Public urban forests in class 1 and 2 condition (Class 1 is healthiest)	Transition 10 acres per year from Class 3 and 4 to Class 1 and 2 condition	72% of forests in Class 1 or 2 condition		Improving


\*percentage increase from 2011 actuals needed to reach target

% Reductions are based on Mayors Climate Reduction Agreement and other City adopted targets.



# GREENHOUSE GAS EMISSIONS





## **Goal:** *Measure, communicate, plan, and act to reduce citywide greenhouse gas emissions.*

Sparked by the U.S. Conference of Mayors Climate Protection Agreement in 2005, cities across the country have demonstrated a commitment to countering climate change. Embracing the approach that “what gets measured gets managed,” the first step for most cities has been to measure key indicators and calculate associated greenhouse gas (GHG) emissions. Measuring emissions allows cities to set goals, assess progress, identify inefficiencies, and lead by example. Conducting an inventory and setting reduction targets can itself inspire action and realize benefits. A recent study found that city governments with emissions reductions targets report three times as many emissions reduction activities as cities without targets.<sup>1</sup> For instance, in Las Vegas, conducting an emissions inventory helped their city government identify inefficiencies in operations. Through review and tracking of energy use, cities can cut costs and improve operations of municipal facilities, streetlights, wastewater treatment, and fleet operations.<sup>2</sup>

Local and state governments in the Pacific Northwest have been the national leaders in furthering policies and initiatives to reduce emissions. The Western Climate Initiative, which included Arizona, New Mexico, Oregon, and Washington, sought to create a multi-state emissions registry and market-based reduction program<sup>3</sup>. In 2008, Washington State ratified a statewide mandate to return to 1990 emissions levels by 2020.<sup>4</sup> That same year, the state legislature passed RCW 70.94.151, which requires a single facility, source, or site that emits at least 10,000 metric tons of greenhouse gases annually to report their emissions to the Department of Ecology. Local activities include a new partnership—the King County-Cities Climate Collaboration—that is providing support to local and regional efforts, such as efforts to establish countywide GHG emissions reduction targets.<sup>5</sup>

In February 2007, Bellevue City Council passed Resolution 7517, formally adopting a goal to try to reduce greenhouse gas emissions to 7 percent below 1990 levels by 2012. Shortly thereafter, Bellevue became a signatory of the U.S. Conference of Mayors Climate Protection Agreement (MCPA). To track progress toward these goals, the City conducted municipal and community-level emissions inventories in 2006 and used models to estimate baseline emissions levels in 2001 and 1990. This report includes the City’s five-year inventory update, documenting the emissions produced by the City in 2011.

Bellevue has achieved significant reductions in municipal emissions since signing the MCPA but, like most of the cities who joined the MCPA, did not reach the stated target in 2012. Notwithstanding that fact, the MCPA has set hundreds of cities on the path to improving the health and well-being of their communities, working to reduce climate change and preparing for impacts that can no longer be avoided, such as droughts, forest fires, changes in the water cycle, and decrease in predictability of storm patterns. Because the latest science shows that climate change is occurring at a pace that exceeds prior scientific estimations,<sup>6</sup> and because Americans are already experiencing some of the costly events foretold by climate scientists, it is even more critical to aggressively pursue both mitigation and adaption strategies.<sup>7</sup>

*“The window of opportunity to limit global warming to 2 degrees Celsius has been missed. We’re looking at a potential 3-4 degree Celsius increase in our global temperature, with dramatic consequences.”*

*—Shin-pei Tsay, director of Cities and Transportation in the Energy and Climate Program at the Carnegie Endowment for International Peace*

# What are the likely effects of climate change on the Pacific Northwest?

The interconnectedness of the global atmosphere and climate means that Bellevue’s natural resources are inherently linked to those outside the geographic boundaries of the City itself. For instance, water shortages in agricultural regions such as Eastern Washington affect food prices in Bellevue. Wildfires in the Olympics affect air quality in the Puget Sound. It is therefore important to monitor natural conditions across regions, states, and beyond. Doing so will help the City to better plan for potential resource shortages, learn from the challenges faced by other areas, and continuously implement best practices. The University of Washington Climate Impacts Group<sup>8</sup> has done extensive research on the long term anticipated impacts that data based climate change trends will have on the Pacific Northwest region. Their findings are as follows:



Increasing snowpack losses are projected. Relative to the 1916-2006 historical average, snowpack losses are projected to reach 28 percent across the state by the 2020s, 40 percent by the 2040s, and 59 percent by the 2080s.



As a result of snowpack losses and more snow falling as rain, seasonal streamflow timing will likely shift significantly in sensitive watersheds. Puget Sound water supplies will see a shift in the timing of peak river flow from late spring (driven by snowmelt) to winter (driven by precipitation) and reduced levels of summer and fall storage. Changes in stream flow can negatively impact spawning cycles of native fish, which depend upon minimal disruption in flow to establish beds and healthy fry, keeping populations healthy over time.\*



Puget Sound water supply systems will generally be able to accommodate changes through the 2020s in the absence of any significant demand increases. The Yakima basin reservoir system will likely be less able (compared to 1970-2005) to supply water to all users, especially those with junior water rights. Without adaptation, shortages would likely occur 32 percent of years in the 2020s, 36 percent of years in the 2040s, and 77 percent of years in the 2080s (compared to 14 percent of years for the period 1916-2006).



Annual hydropower production (assuming constant installed capacity) is projected to decline by a few percent due to small changes in annual stream flow, but seasonal changes will be substantial. On the demand side, population growth is expected to increase winter heating demand even as winter temperatures warm. Summer cooling demand is expected to increase significantly—on the order of 363-555 percent by the 2040s—due to the combined effects of population growth and warmer summer temperatures.

\*Note: while regional waterways may be snow fed, Bellevue’s streams are primarily rain fed and not altered by snow melt patterns.



Due to lack of irrigation water and more frequent and severe prorationing, average production of apples and cherries would likely decline by approximately \$23 million (about 5 percent) in the 2020s and \$70 million (about 16 percent) in the 2080s. Assuming no reduction in irrigation supplies, the impact of climate change on apples, potatoes, and wheat in Eastern Washington is projected to be mild in the short term (i.e., next two decades), but increasingly detrimental with time, with potential yield losses reaching 25% for some crops by the end of the century.



Rising stream temperatures will likely reduce the quality and extent of freshwater salmon habitat. The duration of periods that cause thermal stress and migration barriers to salmon is projected to at least double and perhaps quadruple by the 2080s for most analyzed streams and lakes. The greatest increases in thermal stress would occur in the Interior Columbia River Basin and the Lake Washington Ship Canal.



Due to increased summer temperature and decreased summer precipitation, the area burned by fire regionally is projected to double by the 2040s and triple by the 2080s (relative to 1916-2006). The probability that more than two million acres will burn in a given year is projected to increase from 5 percent (observed) to 33 percent by the 2080s. Primarily east of the Cascades, mountain pine beetles will likely reach higher elevations, and pine trees will likely be more vulnerable to attack by beetles.



Sea level rise will shift coastal beaches inland and increase erosion of unstable bluffs. Major ports likely will be able to accommodate rising sea level at their facilities, but adapting low-lying coastal transportation networks that serve port facilities (e.g., trains, highways) will be a significant challenge. Shellfish production in the state will be negatively impacted by increasing ocean temperatures and acidity, shifts in disease and growth patterns, and more frequent harmful algal blooms.

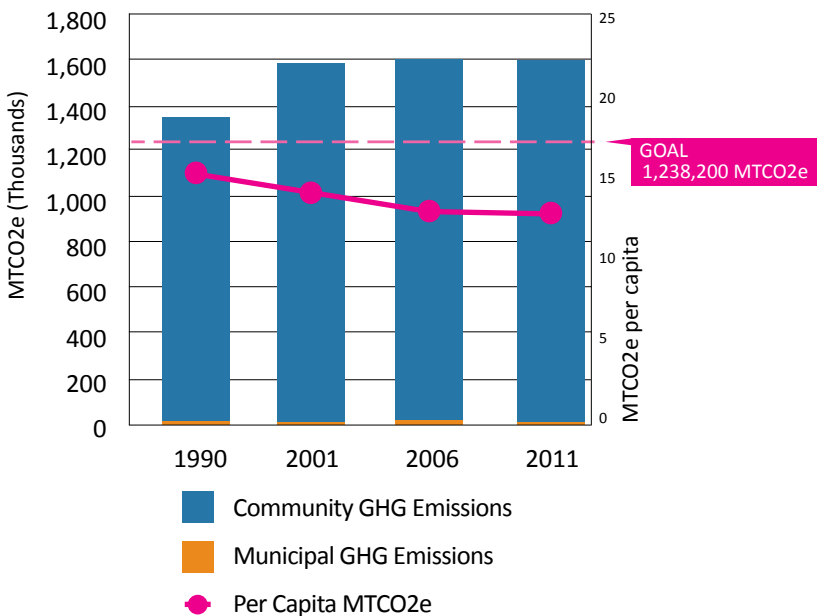


Climate change in Washington State will likely lead to significantly more heat and air pollution-related deaths throughout this century. Projected warming would likely result in 101 additional deaths among persons aged 45 and above during heat events in 2025 and 156 additional deaths in 2045 in the greater Seattle area alone (relative to 1980-2006). By mid-century, King County will likely experience 132 additional deaths between May and September annually due to worsened air quality caused by climate change.

# INVENTORY RESULTS

In 2011, the municipality and community of Bellevue emitted 1.58 million metric tons of carbon dioxide equivalent greenhouse gases (MTCO<sub>2</sub>e). This overall community emissions amount has remained fairly consistent since the City started tracking emissions in 2001 (see figure below). Between 2006 and 2011, municipal emissions decreased by 12 percent (2,000 MTCO<sub>2</sub>e) and community emissions increased by 0.3 percent (4,500 MTCO<sub>2</sub>e).

Bellevue GHG Emission Trends

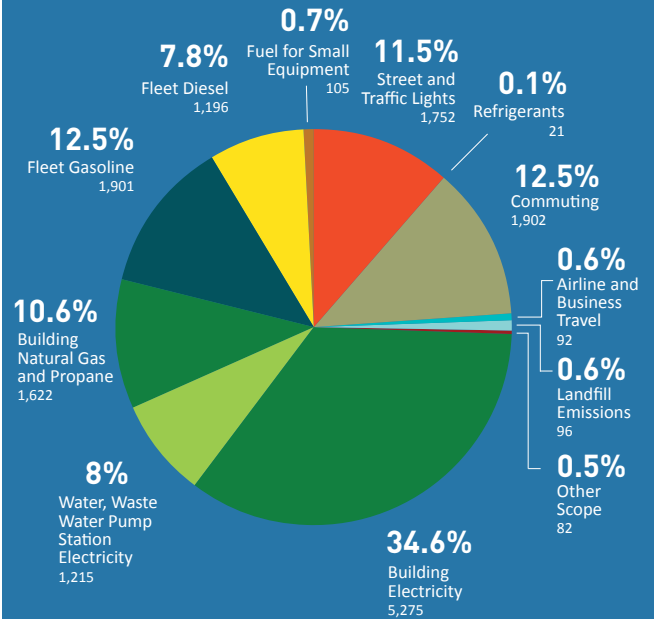


To meet the goal of reducing emissions to 7 percent below 1990 levels, a 22 percent (339,300 MTCO<sub>2</sub>e) reduction from 2011 emissions will be needed.

Municipal emissions, comprising less than 1 percent of total Bellevue emissions, were dominated by building electricity and fleet fuel use, which collectively accounted for over 50 percent of municipal emissions. Community emissions were largely composed of vehicle miles traveled and electricity use, which collectively accounted for over 80 percent of community emissions.

## 2011 Municipal GHG Emissions

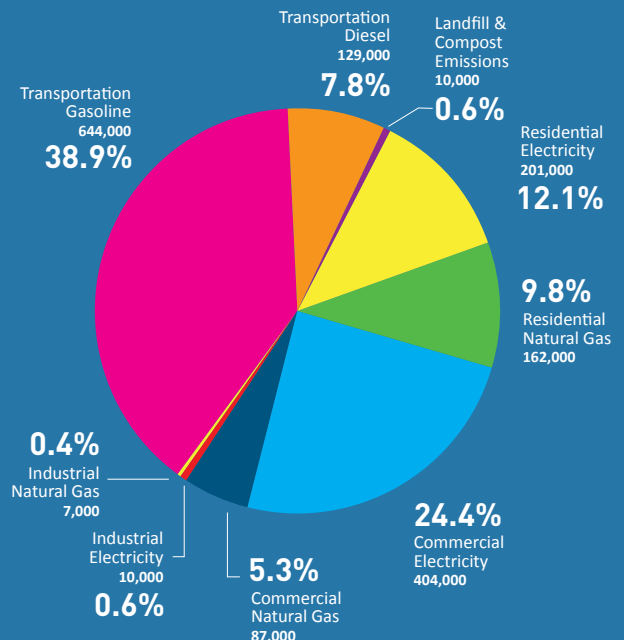
Gross Total = 15,259 MTCO<sub>2</sub>e  
 Landfill Sequestration = (-237) MTCO<sub>2</sub>e\*  
 Net Total = 14,511 MTCO<sub>2</sub>e



All units in MTCO<sub>2</sub>e  
 \* Landfill sequestration is not included in pie chart

## 2011 Community GHG Emissions

Gross Total = 1,653,300 MTCO<sub>2</sub>e  
 Landfill Sequestration = (20,000) MTCO<sub>2</sub>e\*  
 Recycling Impact = (55,800) MTCO<sub>2</sub>e\*  
 Net Total = 1,577,500 MTCO<sub>2</sub>e



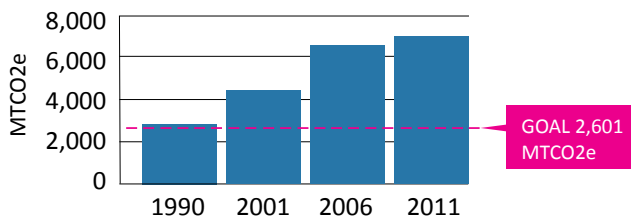
All units in MTCO<sub>2</sub>e  
 \* Landfill sequestration and avoided emissions from recycling are not included in pie chart



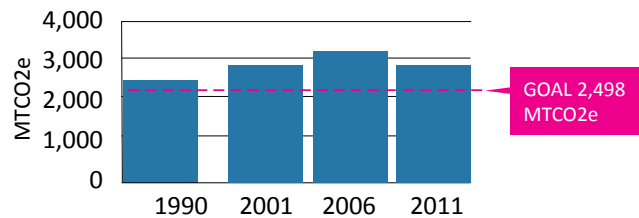
# MUNICIPAL EMISSIONS

Compared to 2006, municipal emissions decreased in all categories except building energy. The City's most significant emissions reductions were observed in streets and traffic lights, employee commuting, and water/sewer pump station electricity, which decreased by 48 percent (1,610 MT CO<sub>2</sub>e), 22 percent (537 MT CO<sub>2</sub>e), and 13 percent (174 MT CO<sub>2</sub>e) in 2011, respectively. From 2006 to 2011, the increase in building energy emissions was relatively small, increasing 386 MTCO<sub>2</sub>e, or 6 percent.

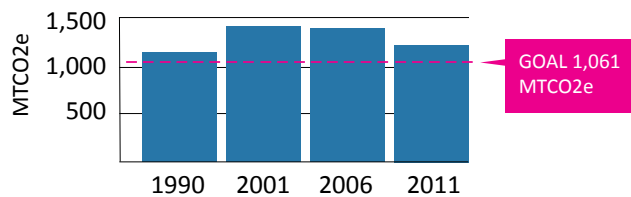
### Municipal Building Energy



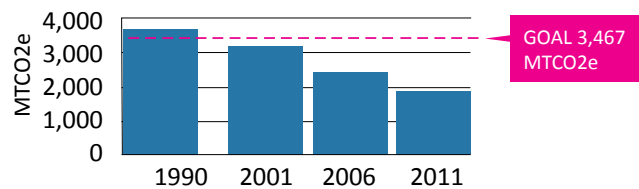
### Municipal Fleet



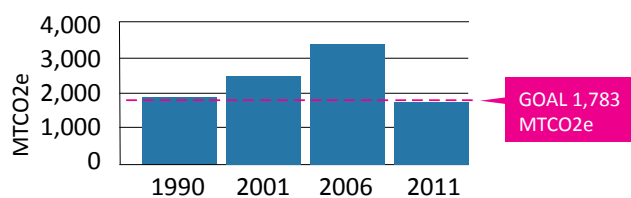
### Municipal Pump Station Electricity



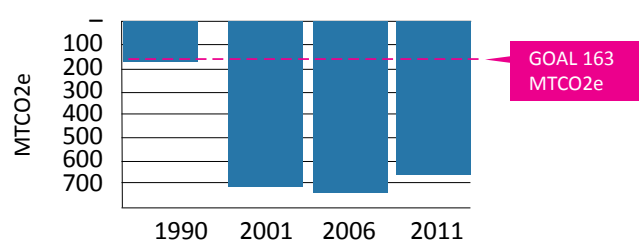
### Municipal Commuting Emissions



### Municipal Street & Traffic Lights



### Municipal Waste Emissions



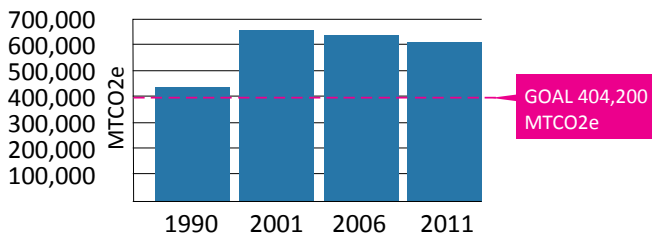
Source: Puget Sound Energy, fuel data from Bellevue Fleet, CTR Surveys of Bellevue City Hall and Bellevue Service Center, waste volume estimates from Republic Services.

\*Note: Charts do not include emissions categories that were unmeasured prior to 2011. In 2011, Bellevue added measurement of fuel for small equipment (generator fuel), airline travel, other Scope 3 emissions (e.g., materials purchased and recycled paper)

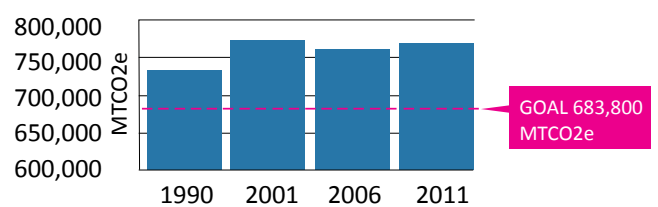
# COMMUNITY EMISSIONS

From 2006 to 2011, emissions from the Bellevue community increased by 4,500 MTCO<sub>2</sub>e, or 0.3 percent. Electricity emissions decreased by 3 percent, or 22,100 MTCO<sub>2</sub>e. Emissions from natural gas and vehicle miles travelled increased by 7 percent (16,500 MTCO<sub>2</sub>e) and 1 percent (9,500 MTCO<sub>2</sub>e), respectively. Landfill disposal emissions decreased by 600 MTCO<sub>2</sub>e, or 7 percent. Because of less waste going to landfill, the amount of carbon being stored in landfill decreased by 5,200 MTCO<sub>2</sub>e, or 21 percent.

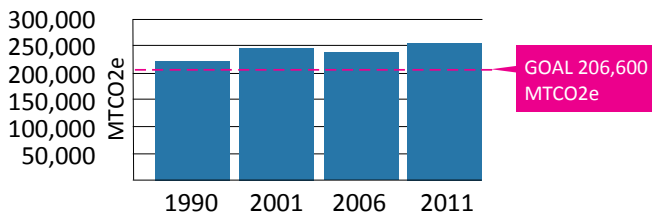
### Community Electricity



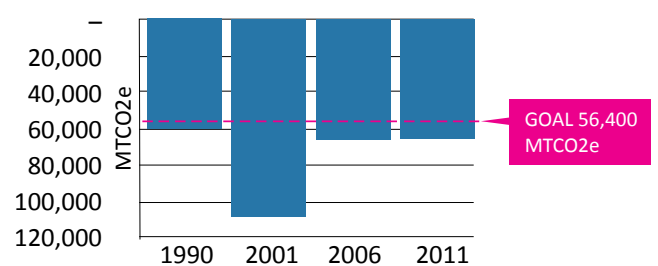
### Community VMT



### Community Natural Gas



### Community Waste Emissions-Net



Source: Puget Sound Energy, Bellevue Department of Transportation model for vehicle miles traveled, waste tonnage reports from Bellevue Utilities.


## NEXT STEPS

The 2011 inventory reveals the City’s emissions are leveling off, reversing an alarming trend in emissions growth. To start a decline in emissions, the City will need to add additional concentrated effort and resources in all categories.

The categories measured in this inventory varied widely in their respective emissions, with three categories (vehicle miles traveled, community electricity, and community natural gas) accounting for over 98 percent of overall emissions. These sectors represent priority areas for reducing emissions and meeting City goals. Emphasis on actions to reduce emissions in these highly contributive sectors would allow the City to direct funds toward those efforts that could offer the most cost effective greenhouse gas emission reduction.

## STRATEGIES & ACTIONS

Many of the actions described elsewhere in this report reduce greenhouse gas emissions. The purpose of this section, therefore, is limited to focusing on the mechanisms required to measure the results of our efforts specifically relating to GHG emissions and ensuring the City is preparing for the foreseeable impacts of climate change. The following three actions focus on these objectives.

STRATEGIES	INDICATORS	ACTIONS
MITIGATE GREENHOUSE GAS EMISSIONS	 Greenhouse Gas Emissions	<ol style="list-style-type: none"> <li>1. Benchmark, report, and regularly monitor community and municipal GHG emissions.</li> <li>2. Make recommendations to City Council to adopt new targets for GHG emissions reduction.</li> <li>3. Determine the need for resiliency planning to minimize the negative impacts of a changing climate.</li> </ol>

**1.** *Benchmark, report, and regularly monitor community and municipal GHG emissions.*

Bellevue calculated municipal and community emissions for the years 2006 and 2011 and, for comparison, estimated those for 2001 and 1990 (the “benchmark” year). That laborious data-collection task will soon be replaced by a web-based application that allows fast and accurate creation of reports showing various environment and natural resource usage data, including greenhouse gas emissions. Easy, transparent, and nearly “real time” data will provide an additional basis for policy decision-making and operational resource management.

**2.** *Make recommendations to City Council to adopt new targets for GHG emissions reduction.*

Bellevue, along with 17 of 39 King County cities, adopted the Mayors Climate Protection Agreement (MCPA) GHG emissions reduction targets: 7 percent below 1990 levels by 2012. As shown, Bellevue has made progress toward, but will not reach, that target by the end of 2012. Having a target in place is important since it provides an operational framework and drives progress. This report recommends that the Bellevue City Council adopt an updated GHG emissions reductions target that is aligned, to the extent feasible and possible, with regional and statewide targets. Grant funding for GHG-reducing efforts is generally more widely available to municipalities that have adopted reduction targets.

**3.** *Determine the need for resiliency planning to minimize the negative impacts of a changing climate.*

Preparing for (or adapting to) the impacts of climate change is necessary to minimize the negative consequences of climate change in Washington. Options for adapting to climate change are varied; and the choices made by any one community will depend on how climate change may affect its interests, the resources available to that community, and the risk tolerance of its residents and leaders. Being a resilient community in this context requires a comprehensive, thoughtful approach to assessing risks and vulnerabilities and implementing prudent preparatory measures.



## MOBILITY & LAND USE





**Goal:** *Significantly expand the use of convenient low- or zero-emission transportation for commutes in and through Bellevue.*

Transportation infrastructure and roadways are among the most visible and defining elements of urban spaces. Transportation systems are also intrinsically linked to the economic development of a city, moving goods and people to and from places of production and employment with efficiency or, alternatively, with substantial delays. How a community provides for the mobility of its residents and workers has profound impacts on quality of life, cost of living, human health, social networks, air and water quality, and wildlife. On an individual level, people with long commutes also report increased stress, health problems, and lower well-being.<sup>9</sup> Ultimately, the long-term sustainability of a city is dependent on the quality of its transportation systems.

The 20th Century saw the rise of the automobile as the primary form of transportation. Automobiles enabled freer movement of people and goods, but at high costs. Air and water pollution, traffic congestion, stress, injury and fatalities, dependence on fossil fuels, and GHG emissions are just a few of the negative consequences that have resulted from the increasing dependence on automobiles use over the past century.

## CHANGING COURSE

Data suggests that a transition away from auto dependence is already underway. Nationally, driving (measured in vehicle miles traveled, or VMT) plateaued in 2004 and began dropping in 2007, reaching its lowest level in nearly a decade in 2011.<sup>10</sup> In the Puget Sound region, the VMT decline began even earlier and has remained steady for a decade, even as population has grown.<sup>11</sup>

Younger people, in particular, are less interested in driving. Drivers ages 21 to 30 drove 12 percent fewer miles in 2009 than in 1995.<sup>12</sup> At the same time, demand for walkable, bikeable, and transit-oriented communities is increasing the value of real estate in communities that support those modes of transportation.<sup>13</sup>

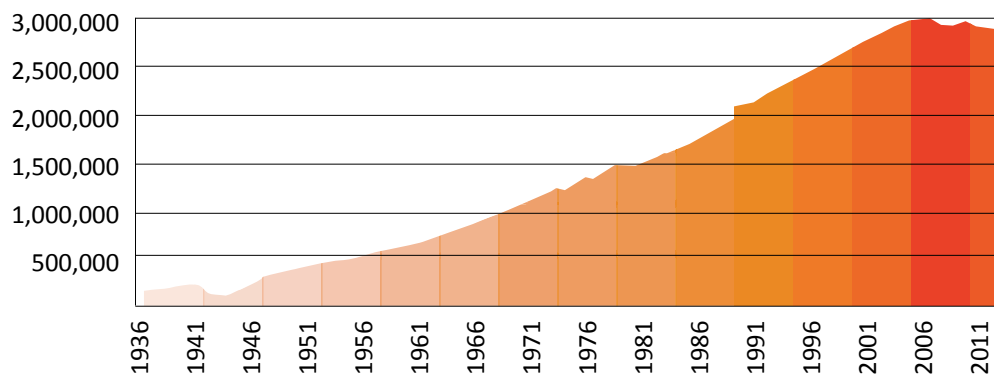
The number of people choosing alternatives to driving is also increasing. Between 2000 and 2010, bicycle commuting in the US increased by 39 percent.<sup>14</sup> To meet the transportation demands of the future, cities must dramatically increase transit, walking, and biking options and design compact, livable neighborhoods where such modes of travel are preferable to using a car. When cars are needed, infrastructure and support for alternative technologies such electric vehicles and alternative fuels will reduce the environmental impacts of vehicles.

*“Let’s remain a City in a Park and not become a City in a Parking Lot.”*

*—Kim Becklund  
Bellevue Transportation  
Policy Advisor*



Total US Vehicle Miles Traveled (in millions)



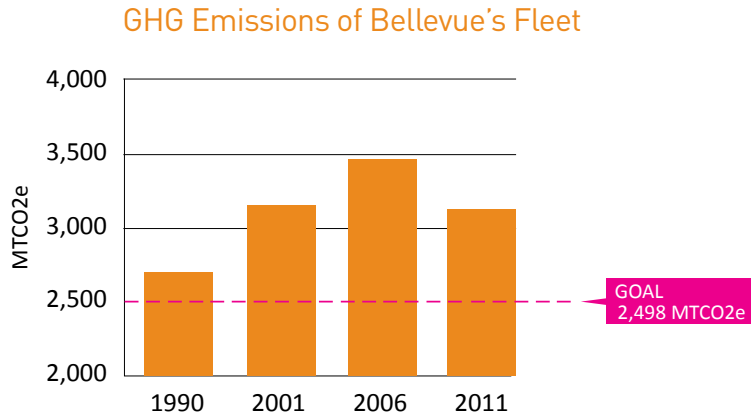
Source: US Department of Transportation Federal Highway Administration. (2010). "Highway Statistics 2010 Public Road Mileage" and "Historical Monthly VMT Report" (2012)

## HOW IS BELLEVUE DOING?

In Bellevue, traffic and limited transportation options are among residents' biggest concerns.<sup>15</sup> Traffic congestion in the Seattle-Bellevue area cost nearly \$2 billion in wasted fuel and lost work hours in 2010 alone.<sup>16</sup> The following data shows Bellevue's progress toward the goals of reduced fuel consumption, reduced vehicle miles traveled, and reduced drive-alone rate.

## GHG Emissions of Municipal Fleet

Bellevue’s addition of electric and alternative fueled vehicles into its fleet is making a measurable difference in the City’s emissions. State law requires that, to the extent feasible, local governments use only electricity or biodiesel to operate publicly owned vessels, vehicles, and construction equipment by the year 2018.<sup>17</sup> ESI’s efforts are helping ensure compliance with that law.

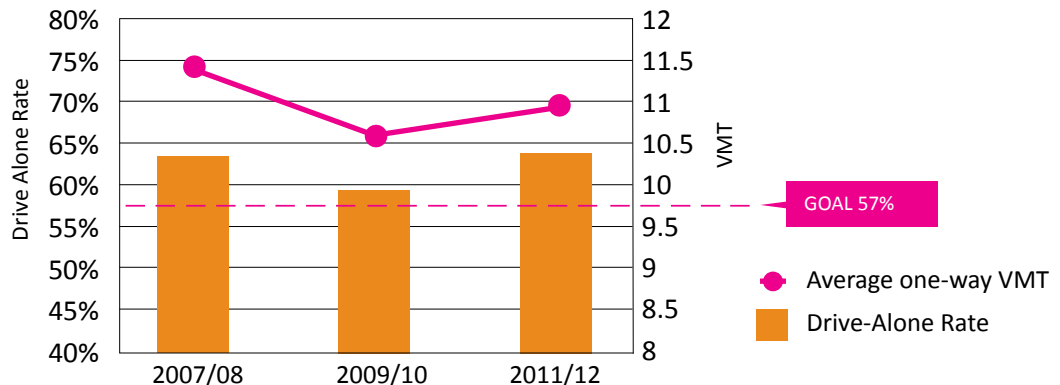


Source: Fuel data provided by Bellevue Fleet.

## Commute Trip Reduction

Accommodating Bellevue’s large and growing daytime population (130,900, in comparison to the residential population of 123,400)<sup>18</sup> presents local and regional travel challenges. The state has mandated a 10 percent reduction in drive-alone rates between 2007/2008 and 2011/2012. This Commute Trip Reduction (CTR) law applies to employers with 100 or more full-time employees in congested areas. The CTR drive-alone rate in Bellevue is currently 63.9 percent. Notably, the number of workers at CTR sites has expanded from 21,316 workers at 52 sites in 2007/2008 (~15 percent of total workers in Bellevue) to 32,449 workers at 60 affected worksites in 2011/2012 (~25 percent of total workers in Bellevue). However, the average number of daily, one-way vehicle miles traveled to work (VMT) has declined from 11.4 miles (one-way) to 10.9 per employee. The chart below shows drive-alone rate and one-way VMT results from Bellevue workers reporting under the CTR program.

### Bellevue Workers Drive-Along Rate and Average One-Way VMT

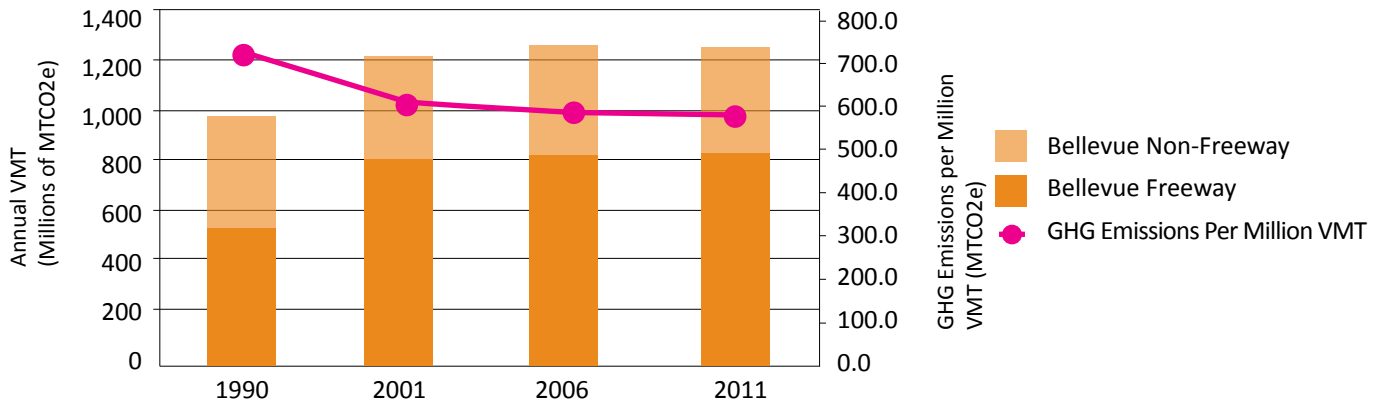


Source: CTR data worksheet (no Fill version) dated 12 Dec 2012, provided by WSDOT

## Vehicle Miles Traveled

Annual vehicle miles traveled (VMT) measures freeway and non-freeway miles traveled in and through Bellevue. Annual VMT increased regionally 2.79 percent from 2005-2011, to 1,330 million miles or 581 MTCO<sub>2e</sub> per million VMT (see GHG Methodology for a full explanation on how this was calculated).

### Total Annual Vehicle Miles Traveled in Bellevue and GHG Emissions Intensity

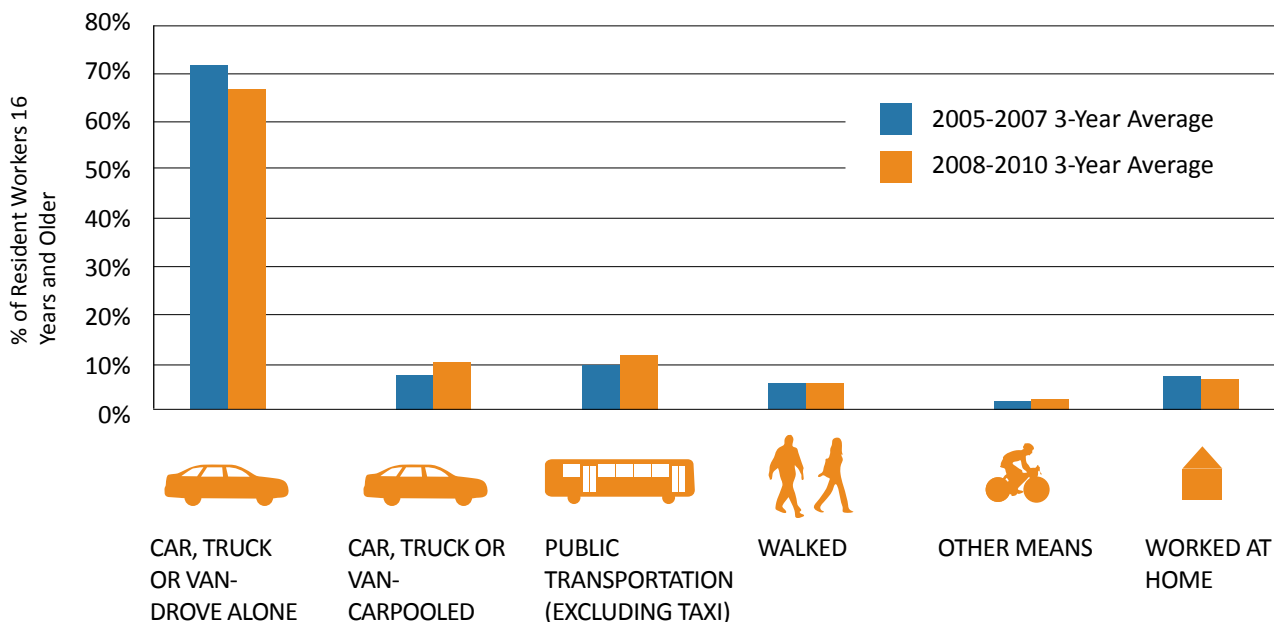


Source: City of Bellevue Department of Transportation 2011 model for vehicle miles traveled, adjusted for previous years which were based on Puget Sound Regional Council models

## Mode Split

Mode split describes the number of trips, or percentage of travelers, using a particular type of transportation. Many cities set mode split targets to encourage balanced and sustainable transport modes (e.g., 30 percent non-motorized [cycling and walking], 30 percent public transport). In the 1980s, Bellevue implemented some of the first Transportation Demand Management policies in the country. The City's Comprehensive Plan includes policies and practices for transportation, land use, and urban design for reducing auto dependency and providing a multi-modal system of viable transportation options.<sup>19</sup>

### Transportation Mode Used by Bellevue Resident Workers



Source: American Community Survey data (3 year averages) "Means of transportation to work by selected characteristics."



# INTEGRATING LAND USE AND TRANSPORTATION IN DOWNTOWN BELLEVUE

Denser, mixed use, and pedestrian-friendly places can result in fewer trips by car and reductions in greenhouse gas emissions. Downtown Bellevue's growth in recent years provides a great example, where many more people are living closer to work, restaurants, and shopping and reducing their vehicle miles traveled. In 2013, Downtown Bellevue had 10,500 residents and over 43,000 employees, spaced over two-thirds of a square mile—only 2 percent of the City's land area.

Bellevue's Downtown Land Use Code has incentivized housing development and active, pedestrian-friendly streetscapes. Maximum parking ratios prevent overbuilding of parking supply. The major east-west arterial, NE 6th Street, is dedicated principally for pedestrians and transit center use, rather than cars. The City works actively with Downtown businesses, transit agencies, and the group Transmanage to shift commuters away from driving alone.

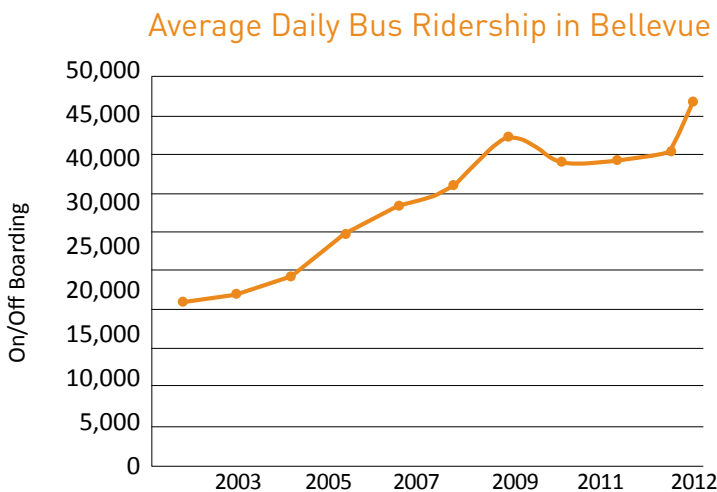


Results on the ground have been dramatic. Since just 2000, transit usage in Downtown Bellevue is up more than 5 times, to total boardings of 14,000 daily trips in 2012 (not counting pass-throughs). Pedestrians are increasing. From 2009-2011, afternoon peak pedestrian counts on 108th Ave NE rose 42 percent and 55 percent on Bellevue Way. About 42 percent of Downtown Bellevue residents commute to work by means other than driving alone – compared to 32 percent for Bellevue as a whole. Fourteen percent of Downtown residents walk to work, and 9 percent of households are car-free.

The Downtown Livability Initiative, underway in 2013, aims to ensure that future growth occurs in a way that is increasingly pedestrian-friendly, sustainable, and additive to the quality of place.

## Public Transit Usage (on/off)

Transit (on/off) statistics show steady growth throughout Bellevue. With these counts of the number of riders getting on and off of buses in key locations in Bellevue, the City can determine if, and to what extent, transit usage is increasing and where more or less transit service is justified.

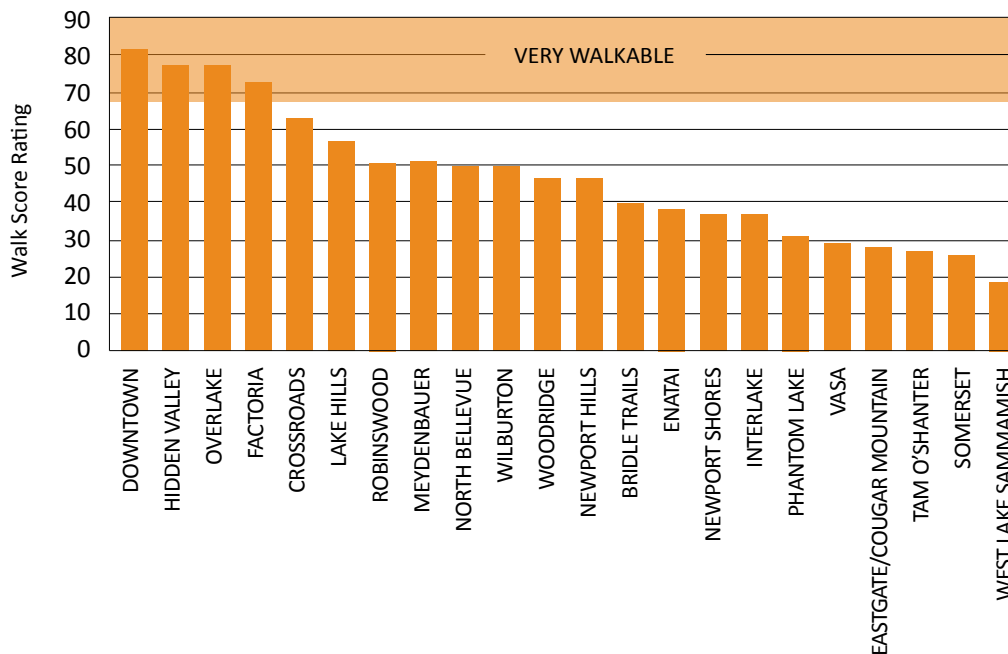


Source: City of Bellevue Department of Transportation (2013). Existing and Future Conditions Report

## Walk Score

One of the characteristics used to evaluate potential places to live and work is the walking distance between homes and amenities (such as parks, restaurants, groceries), which is something attempted to be captured through the “Walk Score.” A Walk Score above 70 indicates that a neighborhood is “very walkable.” Currently, only four out of twenty-two of Bellevue’s neighborhoods rate as “very walkable,” while 14 score below 50, designating them “car-dependent.” Walk Score measures only the “point-to-point” linear distance to amenities and does not integrate any other key criteria for walkability. Walk Score does not, for example, measure street design, safety, topography, or weather.<sup>20</sup> While imperfect, the measurement system is currently being refined and provides an interesting lens combining land use, mobility, environmental and livability evaluation and planning criteria.

Walk Score Of Bellevue’s Neighborhoods

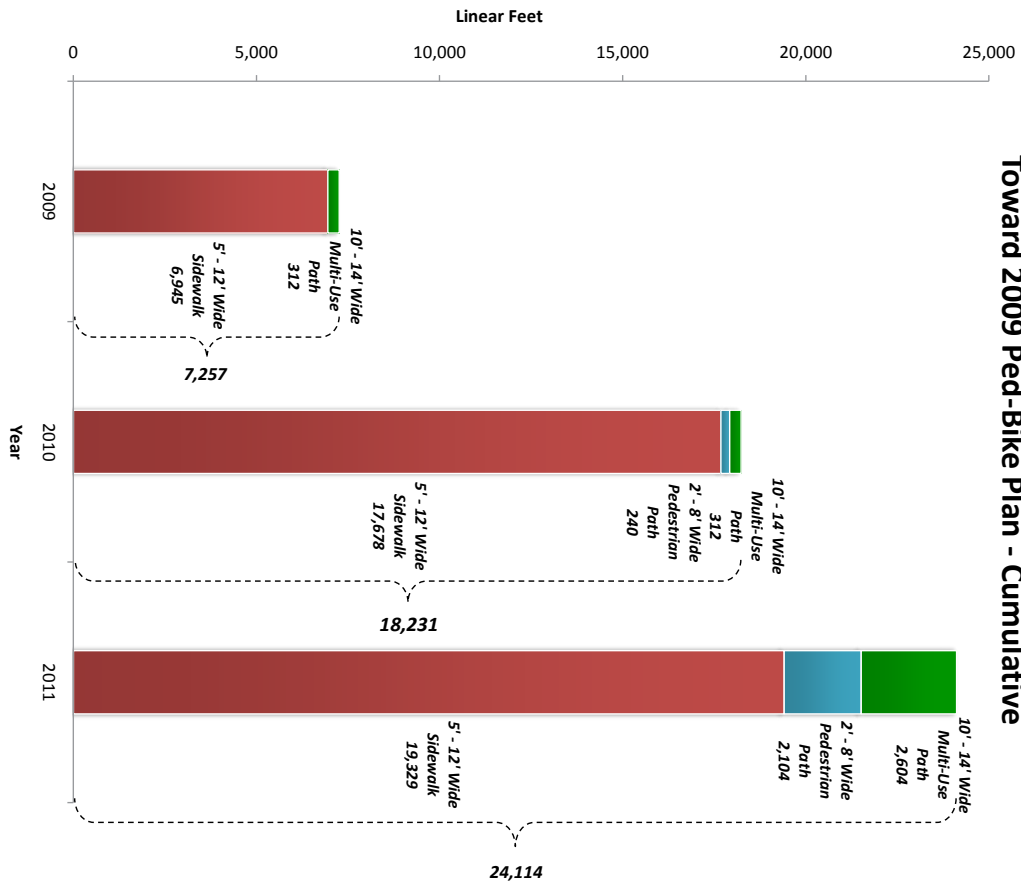


Source: Walk Score for the City of Bellevue. Retrieved September 2012 from <http://www.walkscore.com/WA/Bellevue>.

## Miles of Pedestrian and Bike Facility Construction

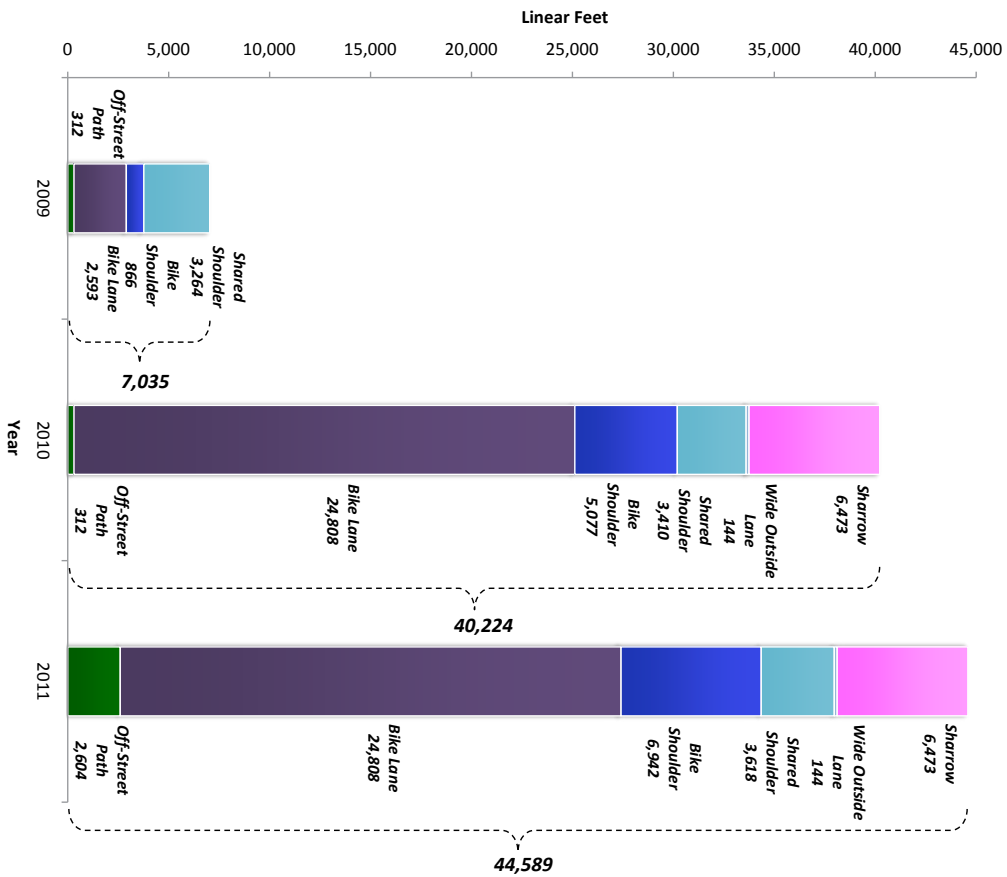
The City of Bellevue supports walking and biking as safe, healthy, and attractive alternatives to driving. Specific routes and corridors are detailed in the City’s Pedestrian and Bicycle Transportation Plan. In 2011, approximately 1.4 miles of pedestrian facilities (2,317 feet of sidewalk, 2,808 feet of pedestrian trail and 2,292 feet multi-use trail) and 0.83 miles of bicycle facilities were built in the City of Bellevue.

## Pedestrian Facility Construction Toward 2009 Ped-Bike Plan - Cumulative



Source: City of Bellevue (2011). Pedestrian and Bicycle Progress Report 2011.

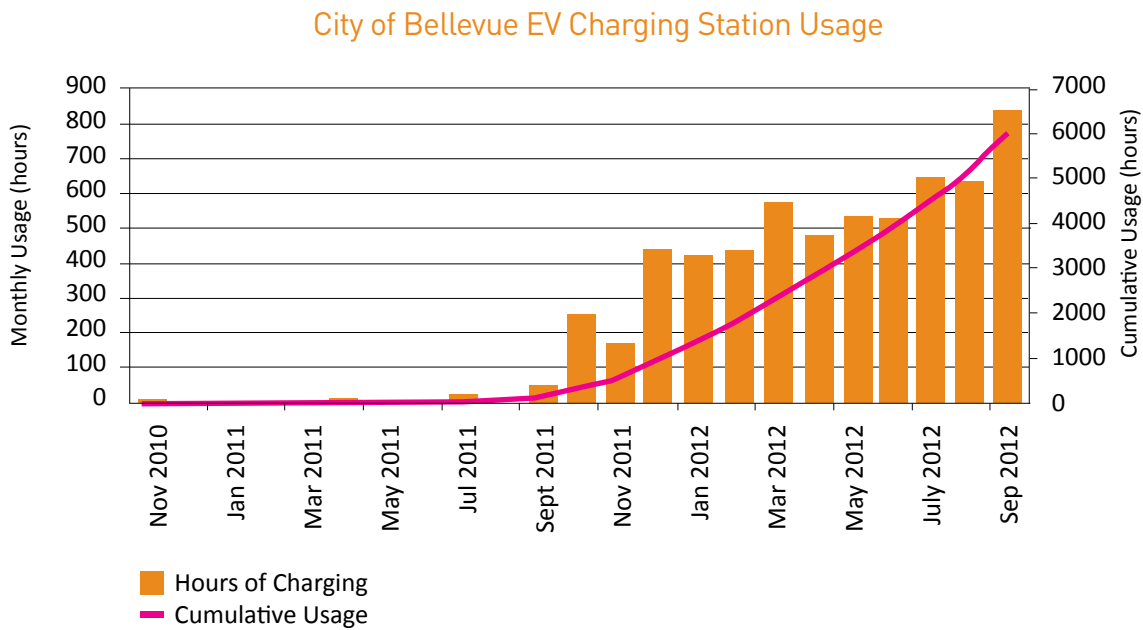
## New Bicycle Facility Construction - Cumulative



## Electrical Vehicle (EV) Charging Station Use

Electric vehicles produce no direct emissions to the air and less pollution into the water ways than gasoline combustion engines. Because of the region’s cleaner power portfolio mix, indirect emissions are lower as well.

Bellevue has installed 22 stations for public and municipal use since early 2011, and the City plans to expand the network. This chart shows increases in monthly station usage, symbolizing significant market adoption of EV technology.



Source: ChargePoint EV reports.

# STRATEGIES & ACTIONS

The City has identified 15 actions for advancing its objectives and making progress toward its key performance indicators in this category over the next five years. Many of these efforts are underway and will be continued or expanded.

STRATEGIES	INDICATORS	ACTIONS
REDUCE MUNICIPAL FLEET FUEL CONSUMPTION	M GHG emissions of municipal fleet	<ol style="list-style-type: none"> <li>1. Pursue Evergreen Fleets certification for Bellevue's fleet.</li> <li>2. Prioritize the purchase and use of alternative fuel vehicles for Bellevue's fleet; select the most efficient vehicle suitable for the job.</li> <li>3. Reduce idling through behavior change strategies and installation of idling reduction technology.</li> </ol>
EXPAND CONVENIENT, LOW EMISSION TRANSPORTATION OPTIONS	C Drive-alone rate (%)	<ol style="list-style-type: none"> <li>4. Improve transportation access and the proportion of non-drive-alone travel in Downtown Bellevue.</li> <li>5. Continue and grow effective Commute Trip Reduction (CTR) and Transportation Demand Management (TDM) programs.</li> <li>6. Explore alternatives to current concurrency methodology to include multimodal aspects of the transportation system.</li> <li>7. Study the issues and opportunities related to minimum and maximum parking requirements.</li> <li>8. Update and maintain the Bellevue Transit Plan as a guide for transit provision in the community; continue to collaborate with and support efforts by agency and community partners to build market share for transit among employees and residents.</li> </ol>
	C VMT	
	C Mode split	
	C On/off-boarding of public transit	
CREATE A WALKABLE AND BIKEABLE CITY	C Walk Score	<ol style="list-style-type: none"> <li>9. Explore land use policies that lead to a greater mix of amenities within neighborhoods.</li> <li>10. Continue planning for transit-oriented development in key sub areas.</li> </ol>
	C Miles of pedestrian and bike facility construction	<ol style="list-style-type: none"> <li>11. Increase accessibility of pedestrian and bike travel routes according to the City's Ped-Bike Plan.</li> </ol>
REDUCE VEHICLE EMISSIONS	C EV charging station use	<ol style="list-style-type: none"> <li>12. Market, recognize, and promote cycling to increase bicycle ridership and pedestrian travel in the community.</li> <li>13. Right-size the community electric vehicle (EV) charging station infrastructure in Bellevue.</li> <li>14. Continue upgrade of traffic signal management system to improve traffic flow.</li> <li>15. Consider mitigation tools for effectively reducing greenhouse gas emissions associated with development projects.</li> </ol>

## CITY FLEET CUTTING CONSUMPTION OF FOSSIL FUELS

Taking significant steps to cut costs and greenhouse gas emissions, the City of Bellevue has replaced aging vehicles with 3 electric cars and over 90 hybrid vehicles.

Steadily replacing gasoline powered with hybrids over the past several years, the City now has 120 hybrids, more than half of the 230 passenger vehicles in the fleet.

Having a large portfolio of high-efficiency vehicles saves the City more than \$100,000 and 30,000 gallons of gasoline each year, and reduces annual fleet carbon dioxide emissions by 250 metric tons. Moving away from gasoline dependency has proved particularly effective as gas prices have climbed.

“We are not only being good stewards of our environment but also of tax dollars by gradually transitioning to a cleaner, greener fleet,” said Mayor Conrad Lee. “We are walking the talk, and showing our community that it is feasible to use greener cars.”

Bellevue’s investment in charging stations is also paying economic dividends, with luxury electric car maker Tesla choosing to site a showroom here, alongside Chevy and Nissan who are also selling electric models.



### 1. Pursue Evergreen Fleets certification for Bellevue’s fleet.

Efficient fleets reduce government spending and increase healthy living for residents. This action includes Bellevue pursuing certification with the Evergreen Fleets program, a project of the Western Washington Clean Cities Coalition. Certification will align Bellevue’s fleet performance with national standards and provide opportunities for recognition by the national Government Green Fleet 100 Best Fleets program.

### 2. Prioritize the purchase and use of alternative fuel vehicles for Bellevue’s fleet; select the most efficient vehicle suitable for the job.

By diversifying fuels away from traditional fossil fuel (e.g. toward, E-85 Flex Fuel, biodiesel, electric, and natural gas) and

selecting the right size vehicle for optimum efficiency, fleet managers have a significant opportunity to save money and resources.<sup>21</sup> To facilitate this, an internal Fleet Governance Committee will work with City departments, including Procurement, to develop policies and procedures to select the most efficient fuel and vehicle for the job. This action includes the City’s fueling infrastructure being updated to provide bio-diesel, E85, and/or EV plug-in stations for Bellevue’s fleet.

### 3. Reduce idling through behavior change strategies and installation of idling reduction technology.

Vehicles get the worst MPG when their engines run but they don’t move. Because of this, as well as noise and particulate impacts, many states and municipalities restrict idling or have anti-idling policies. In addition, new technology such as battery-based auxiliary power systems for aid cars can assist even further with reducing idle time.

#### **4.** *Improve transportation access and the proportion of non-drive-alone travel in Downtown Bellevue.*

This action will continue to implement and work towards the goals of the Downtown Bellevue Growth and Transportation Efficiency Center plan (“Connect Downtown”), a program which is a component of the state’s revised 2006 Commute Trip Reduction law. This plan provides a customized downtown-wide trip reduction program with 10 objectives covering elements such as public/private partnerships, amenities, marketing, and incentives. The Connect Downtown goal is 63.9% commute drive-alone rate from the 71% baseline. As of 2011, Bellevue is at 65%.<sup>22</sup>

#### **5.** *Continue to grow effective Commute Trip Reduction (CTR) and Transportation Demand Management (TDM) programs.*

CTR programs are required by Washington State law. In Bellevue, employers with 100 or more employees commuting to a worksite in the 6-9 a.m. peak period are required to establish programs to reduce commute trips (BCC 14.40). These employers are eligible to receive assistance from the City to develop effective programs and measure progress. City TDM programs include support for downtown employers through the voluntary Commute Advantage program. In addition, Bellevue maintains the ChooseYourWayBellevue.org website as a one-stop resource for employers, employees, and residents to learn about transportation options and available resources. CTR and TDM programs save money and emissions while significantly reducing congestion.

#### **6.** *Explore alternatives to current concurrency methodology to include multimodal aspects of the transportation system.*

Washington State’s Growth Management Act (GMA) contains a provision requiring local jurisdictions to have in place, or to have funded, necessary transportation facilities concurrent with new development. These Level-of-Service (LOS) standards, called concurrency, are based on the flow rate, built capacity of lanes, and the traffic signals required by Bellevue City Code. Concurrency standards currently do not include pedestrian, bike, bus rapid transit or rail facilities that, in addition to the street network, provide for mobility in dense urban areas. The City of Bellevue aims to explore incorporating more of these multi-modal transportation LOS standards into its concurrency standard. However, significant barriers exist due to the unavailability of reliable measures of alterna-

tive mode improvement impacts on area mobility and necessary financial planning to forecast transit use. The City of Bellevue will work towards resolving these issues in order to better reflect the multi-modal mobility in Downtown and other urban growth areas.

#### **7.** *Study the issues and opportunities related to minimum and maximum parking requirements.*

The current Land Use Code requires developers to build a minimum number of parking spaces based on size and location. This can lead to sprawling parking lots that consume otherwise valuable land and increase traffic congestion while reducing valuable assets like tree canopy and walkability. If auto spaces are not required because of a use of transit, carpooling, walking, or biking, an exemption process for providing onsite parking is needed. Where parking spaces have been reduced, innovative mitigation options for parking impacts should be allowed.

#### **8.** *Update and maintain the Bellevue Transit Plan as a guide for transit provision in the community; continue to collaborate with and support efforts by agency and community partners to build market share for transit among employees and residents.*

Transit services in Bellevue are provided by outside agencies (Sound Transit and King County Metro). The City, however, plays an essential role in providing the infrastructure, planning, and a financial share in expanding and facilitating these transit networks. This strategy continues to support future-focused transit projects that reduce auto-dependency for Bellevue’s residents and workforce.

#### **9.** *Explore land use policies that lead to a greater mix of amenities within neighborhoods.*

Bellevue plans for development through its Comprehensive Plan, which is updated every 7 years. The Comprehensive Plan is aligned with the state’s Growth Management Act and King County’s countywide planning policy. Land use planning for increased urban density, as well as encouraging neighborhood scale amenities, are proven ways to reduce vehicle miles traveled.



## TRANSPORTATION PARTNERSHIPS

Bellevue is served by nearly 40 King County Metro and Sound Transit routes. Under the framework of the Bellevue Transit Plan, the City encourages provision of transit service to activity centers and neighborhoods at levels that make transit a viable option for many Bellevue residents and workers, and facilitates speed and reliability for transit. Riders on the Rapid Ride B line—which opened in Fall 2011 and connects downtown Bellevue to Crossroads, Overlake and Downtown Redmond—benefit from signal priority for buses at certain key intersections along the route.

Through a partnership of the City of Bellevue, other eastside cities and social services agencies, the Eastside Easy Rider Collaborative increases transportation access and options for persons with disabilities, older adults and low income residents.

The City is working closely with Sound Transit on planning for the East Link light rail line, which will connect downtown Bellevue with Bel-Red and Redmond Overlake to the east and Seattle to the west and open for service in 2023.

## 10. *Continue planning for transit-oriented development in key sub-areas.*

Transit-oriented development (TOD) is a concept that creates compact, walkable, livable communities near bus and train lines. Such developments create communities that include a mix of jobs, housing, and urban amenities, providing residents lifestyle options that are not inextricably tied to automobiles. California Air Resources Board studies show that “significantly increasing walking and transit opportunities,” along with strategically located moderate-to-high-density development and transit, could achieve an annual reduction in vehicle miles traveled (VMT) of between 20-30 percent per TOD household.<sup>23</sup> Transit-oriented development reduces regional road congestion, improves air quality, increases transit ridership, and reduces fuel expenses for residents-promoting a healthier lifestyle overall. In Bellevue, key transit sub-areas include Downtown, Eastgate/I-90, Wilburton, Bel-Red 2023, and the Spring District 2023.

## 11. *Increase accessibility to pedestrian and bike travel routes according to the City’s Ped-Bike Plan.*

People walk and bike more often if the travel routes for doing so are safe, attractive, and enjoyable. In the US, walking and cycling are much more dangerous than car travel, both on a per-trip and per-mile basis.<sup>24</sup> Closing infrastructure gaps in sidewalks increases pedestrian safety, as do traffic calming and signal improvements, while improving exercise opportunities and health outcomes. The City’s Ped-Bike Plan calls for 435 projects that when built will yield 90 miles of sidewalk, 144 miles of bikeway, and 20 miles of trail facility improvements. Examples like the West Lake Sammamish Parkway project are enabling more multi-modal mobility for residents.<sup>25</sup>

## 12. *Market, recognize, and promote cycling to increase bicycle ridership and pedestrian travel in the community.*

Traffic improvements can be supplemented by incentive programs in order to increase non-motorized travel. The City’s TDM program incentivizes bike trips by promoting relevant information, giveaways, and contests and installing bike racks. May is Bike to Work Month in the Puget Sound and is a great example of how to recognize and encourage people to get on their bikes. The City hopes to expand its education programs to encourage residents, students, and employees to bike and walk farther and more often.



## ELECTRIC CAR CHARGING LAUNCHES IN BELLEVUE

As of 2012 Bellevue owns 22 stations for municipal and community use. With demand increasing for public electric vehicle charging stations, the City is exploring plans to expand.

The charging stations—funded by the Western Washington Clean Cities Coalition and the American Recovery and Reinvestment Act—automatically track information, allowing the City to understand usage patterns, estimate reductions in petroleum use, and track other data.

The use of electric vehicles rather than cars with internal combustion engines reduces air pollution from Bellevue’s largest single emissions sector – transportation.



### 13. *Right-size the community electric vehicle (EV) charging station infrastructure in Bellevue.*

The City will work both independently and with commercial buildings to right-size the network of charging stations, including consideration of siting Level III “Fast Chargers,” in areas with the highest demand and usage. Other considerations in this process include appropriate cost recovery pricing and regional and state collaboration efforts.

### 14. *Continue upgrade of traffic signal management system to improve traffic flow.*

Traffic signal management allows the City to coordinate and synchronize traffic signals. Bellevue has long been a national leader in signal management, but recent advances in “adaptive” signals (signals that adapt to real time traffic conditions) provide additional opportunities to increase efficiency and therefore air quality and fuel efficiency. Bellevue is in the process of converting all signals to traffic adaptive technology, with plans to complete the project in 2015.

### 15. *Consider mitigation tools for effectively reducing greenhouse gas emissions associated with development projects.*

Bellevue Development Services staff have begun disclosing greenhouse gas impacts of major new developments under review within the City’s jurisdiction through the State Environmental Policy Act (SEPA). Such SEPA requirements are focused on identification, disclosure, and consideration of GHG impacts. However, this information is not currently being utilized to identify greenhouse gas mitigation options associated with the development. This action recommends research and evaluation of potential approaches to mitigating greenhouse gas impacts from new development.

**ENERGY & WATER**



**Goal:** *Ensure long-term access to clean energy and water while reducing the fiscal and environmental impacts of consumption.*

Energy and water supplies are inherently linked to Bellevue's quality of life, economic development, and community health. This region is blessed with some of the best-tasting, cleanest, and most abundant water supply in the country. Reliable, plentiful, and relatively inexpensive energy is another environmental asset that, while often taken for granted by residents, is a reason many major industries and employers locate in the Northwest. However, neither of these assets is endless or without environmental impact. Conservation and efficiency measures, along with focus on the increase of renewable energy, will help protect these attributes into the future.

Hydropower generates 50 percent of Puget Sound Energy's (PSE) electricity.<sup>26</sup> This has given rise to our reputation for having "clean" electricity, as compared to the national average of 42 percent electricity from coal-fired power plants.<sup>27</sup> However, one third of PSE's electricity comes from the coal-fired power plant it co-owns in Colstrip, Montana, which means that electricity use within Bellevue still requires significant combustion of coal.<sup>28</sup>

Even electricity generated from hydropower has negative environmental effects, the primary one being the impact on salmon and other aquatic habitat. Dams radically alter natural water temperatures, chemistry, flow characteristics, and sediment loads, all of which can lead to significant changes in the ecology and physical characteristics of the river upstream and downstream.

The other key fuel source in the region, natural gas, is "cleaner" than coal. However, there are significant concerns about the environmental and human health impacts of natural gas extraction efforts, especially those related to groundwater. The combustion of natural gas also emits carbon.

For these reasons, strategies that increase installation of renewable energy generation sources while simultaneously working on energy conservation and efficiency make a lot of sense.

The supply of water in Western Washington is currently quite robust. However, scientists from the UW Climate Impacts Group show that April snow water equivalent (SWE) is projected to decrease by an average of approximately 27-29 percent across Washington State by the 2020s, 37-44 percent by the 2040s, and 53-65 percent by the 2080s, as global average temperatures increase,<sup>29,30</sup> meaning that water resources and storage planning will become increasingly important.

*"The US economy has tripled in size since 1970 and three-quarters of the energy needed to fuel that growth came from an amazing variety of efficiency advances-- not new energy supplies. ...Going forward, the current economic recovery, and our future economic prosperity, will depend more on new energy efficiency behaviors and investments than we've seen in the last 40 years."*

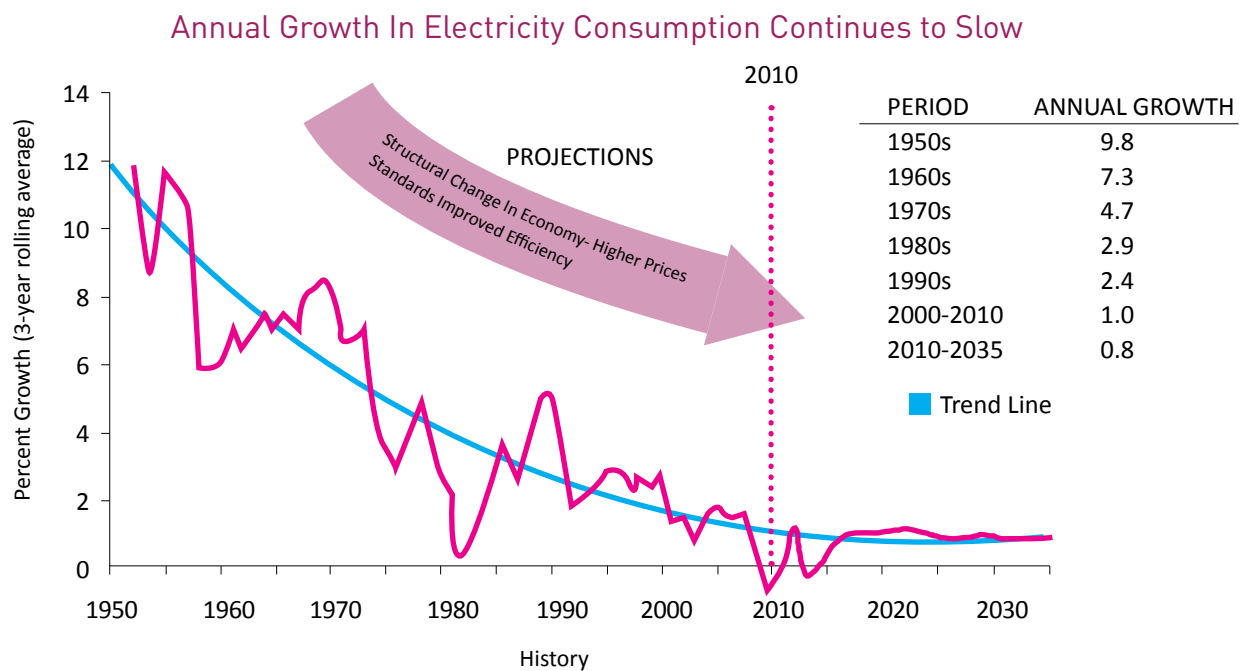
*-John A. Skip Laitner, The Long-Term Energy Efficiency Potential, ACEEE, January 2012*

# CONSERVATION AND EFFICIENCY: A SUCCESS STORY

Steady population growth in the Puget Sound region requires utilities to meet growing demands for energy and water. One way that utilities have met increased demand is by supporting conservation efforts.

Since 1978, regional energy efficiency measures have produced nearly 3,700 MW of savings – equivalent to the production capacity of more than six coal plants. These energy efficiency measures reduce costs for rate payers, conserve natural resources, and avoid the significant capital and operating expenses of building new facilities.<sup>31</sup>

Increased energy efficiency in buildings is a primary reason for a slowing rate of growth in electricity consumption nationwide, despite growing populations and building stock. Nationally, the building sector accounted for about 41 percent of primary energy consumption in 2010, 44 percent more than the transportation sector and 36 percent more than the industrial sector.<sup>32 33</sup>



Source: EIA, Annual Energy Outlook 2012

With respect to water, proactive investments and ongoing efforts, including those of the Puget Sound Partnership, strive to ensure that the protection of the Puget Sound regional watershed and the ongoing availability of safe, dependable water supply. Efficiency technologies and practices have reduced water demand below even the most conservative planning estimates, and the central Puget Sound has sufficient water for at least the next 50 years.<sup>34</sup>

Finally, renewable energy generation is starting to lower carbon emissions from electricity delivered through the grid. In 2006, Washington became the second state after Colorado to pass a renewable energy standard by ballot initiative. Renewable energy has effectively brought down the Northwest region’s grid baseload emissions from 907 lbs of CO<sub>2</sub>e per MWh in 2005 to 823 lbs of CO<sub>2</sub>e per MWh in 2009—a 9.2 percent reduction!



Washington State Initiative 937 required that electric utilities serving more than 25,000 customers in the state of Washington obtain 15 percent of their electricity from new renewable resources by 2020 and undertake all cost-effective energy conservation. The Union of Concerned Scientists found that by 2025, I-937 will result in the following economic benefits for Washington:

- 2.9 percent, or \$1.13 billion, in savings on consumer electricity bills
- 2,000 new jobs in manufacturing, construction, operation, maintenance, and other industries
- \$138 million in additional income and a \$148 million increase in gross state product
- \$2.9 billion in new capital investment
- \$30 million in income to rural landowners from wind power land leases
- \$167 million in new property tax revenues or payment in lieu of taxes for local communities

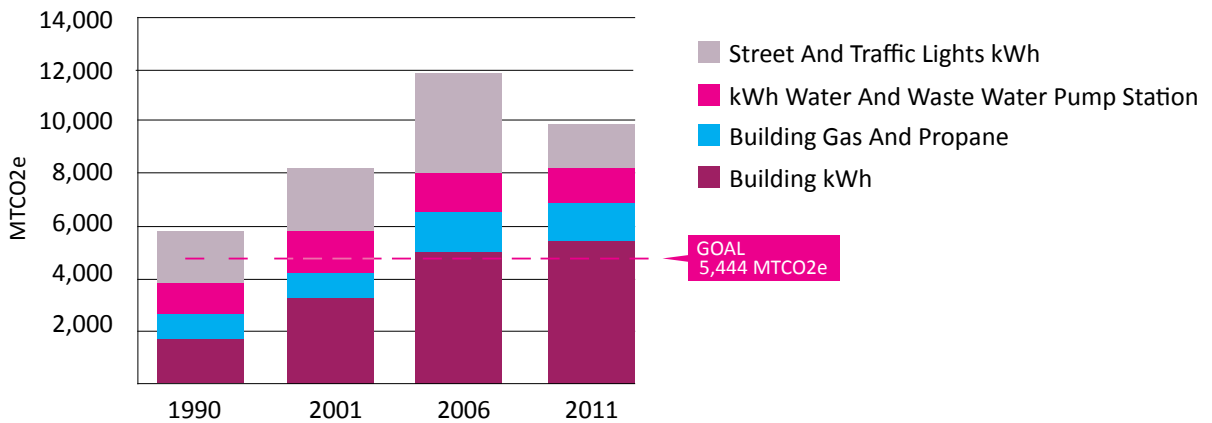
# HOW IS BELLEVUE DOING?

The following data show Bellevue’s progress toward the goals of conserving energy and water and increasing the production and use of renewable energy.

## Energy Consumed - Municipal

Energy efficiency gains throughout the City have reduced greenhouse gas emissions by 1,498 MTCO<sub>2</sub>e since 2006. A proactive resource conservation program accelerated progress in this area since 2009, reducing overall building energy use by 11 percent (without adjusting for outside air temperature). Bellevue City Hall has reduced energy consumption by 27 percent since 2009.

Municipal Electricity and Natural Gas Carbon Emissions  
(all City meters)

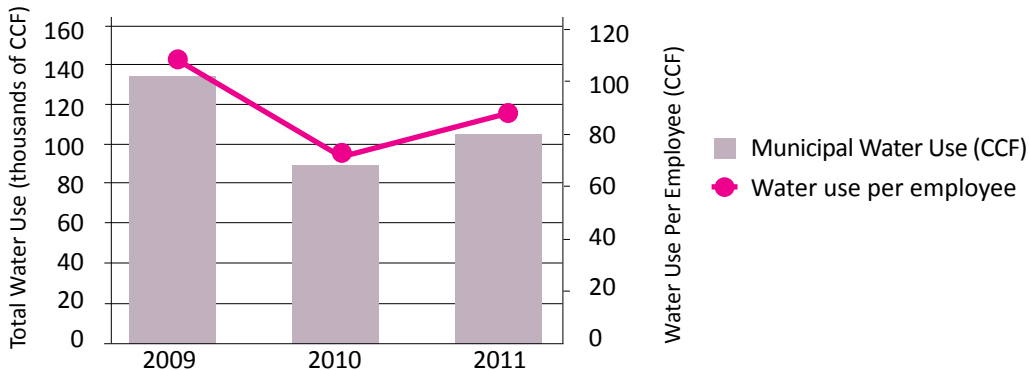


Source: Puget Sound Energy

## Gallons of Water Used - Municipal

The summer of 2009 was relatively dry and hot in Bellevue compared to those of 2010 and 2011. In 2011, several significant leaks (which were repaired) at City Hall and Downtown Park increased the usage compared to 2010. In 2011, municipal water use per employee was 88 CCF.

Municipal Water Use

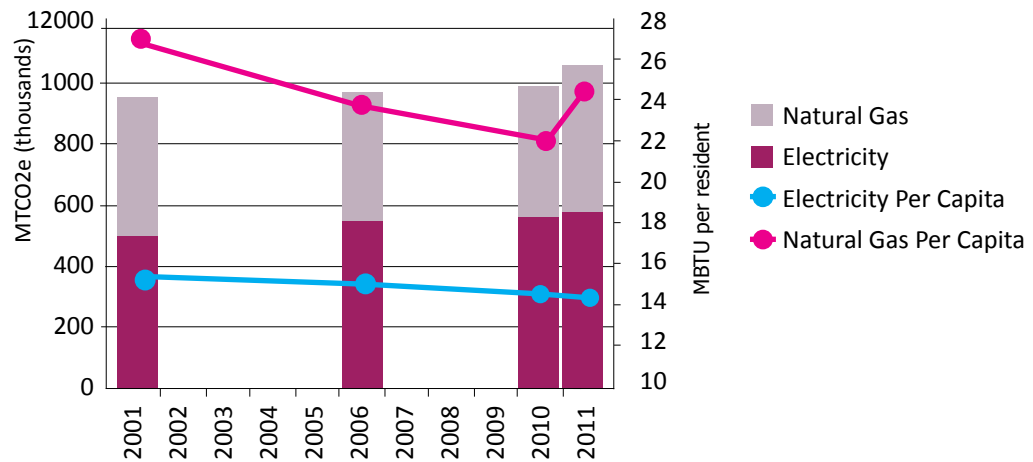


Source: Dave Perry, Bellevue Utilities, Bellevue City Accounts

## Energy Consumed - Community

Residential and commercial efficiency programs and the implementation of the Washington State Energy Code have caused energy use per capita to decline over time. However, total population growth was greater than the per capita reductions, resulting in a net consumption increase compared to 2001.

Total and Per Capita Community Energy Use, 2001-2011

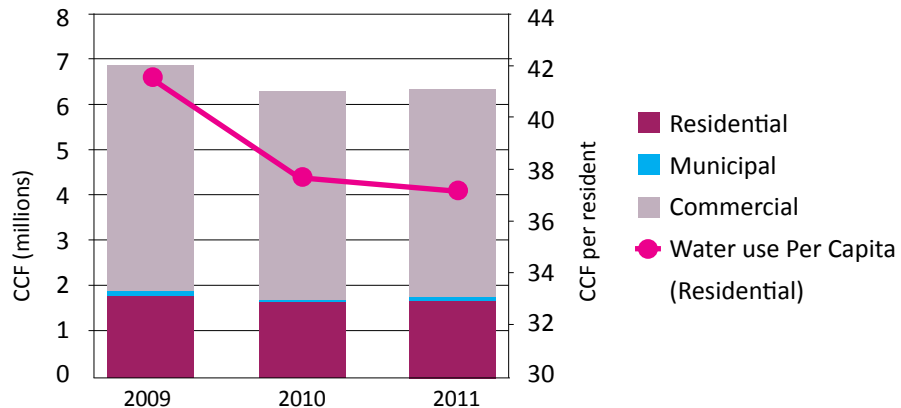


Source: Puget Sound Energy

## Gallons of Water Saved Per Day - Community

Water conservation programs have resulted in savings of more than 566,453 gallons of water per day in Bellevue. Cooler, wetter springs and summers in 2010 and 2011 significantly reduced irrigation demand, a major factor in overall water use. In addition, water use per resident has declined since 2009.

Total and Per Capita Water Use, 2009-2011

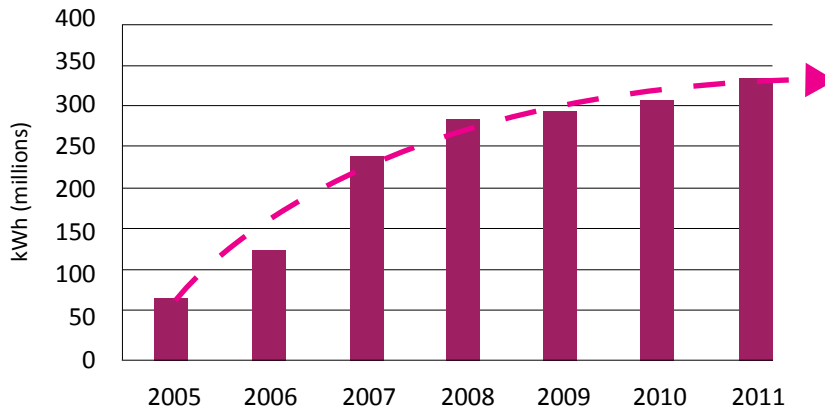


Source: Dave Perry, Bellevue Utilities, Purveyor Reports

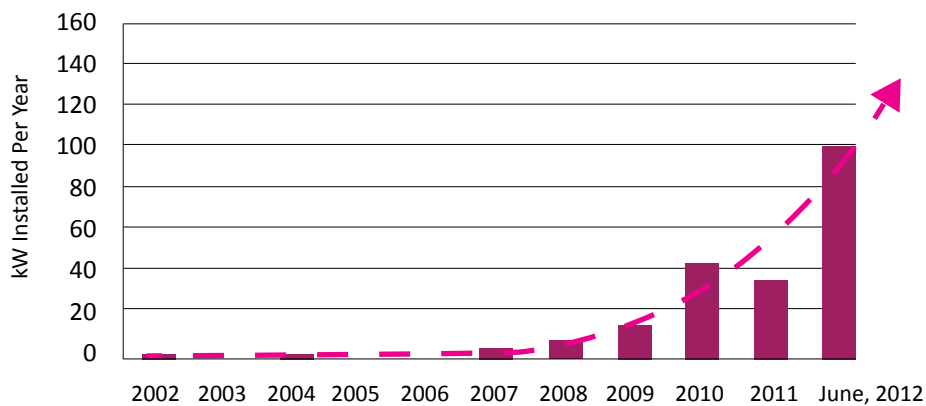
## PSE Sales of Green Power and kW of Renewables Installed

Purchases of “Green Power,” a program managed by PSE that allows customers to pay a slight premium for the purchase of renewable energy, are increasing, showing a demand for green power supplied to the grid. Despite a slight decline in 2011, overall renewable projects installed (solar photovoltaic panels, and wind turbines) are increasing in Bellevue each year.

Green Power Purchased by PSE’s Bellevue Customers



kW of Renewable Energy Installed in Bellevue per Year



Source: Puget Sound Energy



# STRATEGIES & ACTIONS

The City has identified 12 actions for advancing its objectives and making progress toward its key performance indicators in this category over the next five years. Many of these efforts are underway and should continue or be expanded.

STRATEGIES	INDICATORS	ACTIONS
IMPROVE PERFORMANCE OF MUNICIPAL BUILDINGS AND SITES	<b>M</b> Energy consumed	<ol style="list-style-type: none"> <li>1. Continue to implement energy and water conservation retrofits and operational improvements for municipal facilities, street lights and traffic signals, and pump stations.</li> <li>2. Increase the City's I.T. energy efficiency.</li> <li>3. Continue to install and implement water-efficient landscaping and practices for streetscapes, park sites, City facilities, and City-maintained plantings.</li> <li>4. Operate and build City facilities according to established high performance standards of EPA's ENERGY STAR and the USGBC's Leadership in Energy and Environmental Design (LEED), and pursue certification where possible.</li> <li>5. Establish an internal Revolving Loan Fund (RLF) to capture savings from efficiency upgrades and fund new projects.</li> </ol>
	<b>M</b> Gallons of water used	
IMPROVE PERFORMANCE OF COMMUNITY BUILDINGS AND SITES	<b>C</b> Energy consumed	<ol style="list-style-type: none"> <li>6. Establish energy use benchmarking and disclosure requirement for commercial and City buildings with more than 25,000 square feet and multifamily buildings with more than 20 units.</li> <li>7. Encourage energy and water conservation and green building in Bellevue through the energy code and other tools.</li> <li>8. Reduce code barriers and streamline permitting processes for green building and renewable energy projects.</li> <li>9. Move toward real-time energy and water consumption information for customers through electrical "smart-grid" technology and automated meter reads for water use.</li> </ol>
ENGAGE THE COMMUNITY ON BEST PRACTICES FOR CONSERVATION	<b>C</b> Gallons of water saved per day	<ol style="list-style-type: none"> <li>10. Encourage municipal and private market participation in voluntary programs to drive energy and water conservation.</li> <li>11. Conduct community awareness programs to encourage energy and water conservation practices and renewable energy purchases.</li> </ol>
SUPPORT RENEWABLE ENERGY	<b>C</b> PSE sales of Green Power and kW of renewables installed in Bellevue	<ol style="list-style-type: none"> <li>12. Implement renewable energy projects and study the potential for district energy sub-areas in Bellevue.</li> </ol>



## GREENING BELLEVUE I.T.

Information Technology (I.T.) is integral to a high-performing, resource-efficient, and low-carbon organization. For instance, I.T. facilitates teleworking by enabling remote access to applications and data, instituting double-sided printing as the default in 2008 (delivering a 17 percent reduction in paper use), and extending equipment life cycles (PC life was extended from three years to four, and server life was extended from four years to five).

Bellevue's transformation to a thriving high-tech hub required an optimized I.T. infrastructure to support online City services, an extensive application portfolio to manage City operations, and 35 percent annual data growth—all while lowering costs to meet budget reduction targets and staying committed to green I.T.

In order to achieve environmental performance goals, the I.T. Department consolidated direct-attached storage, network-attached storage, and storage area network on a NetApp unified storage architecture. They also leveraged VMware to virtualize and consolidate 70 percent of approximately 200 servers, and they plan to hit an 80 percent virtualization goal in 2012.

Consolidating storage with virtualization enables I.T. to quickly deliver customer services with faster and easier provisioning. The consolidated infrastructure also facilitates appropriate disaster recovery plans, private cloud for secure multi-tenancy and isolation, and virtual desktops.

As part of this commitment, Bellevue I.T. and its facilities organization set higher data center temperatures and installed more-accurate power meters to better measure and assess trends in our energy consumption. The power-usage effectiveness (PUE) improved from 1.6 in 2007 to an ENERGY STAR PUE of 1.5 in 2011, which is rated as "efficient" in terms of industry standards.

### 1. *Continue to implement energy and water conservation retrofits and operational improvements for municipal facilities, street lights and traffic signals, and pump stations.*

Bellevue's Resource Conservation Manager (RCM) program, launched in April, 2009, helps to quantify savings and initiate low-cost conservation throughout the City, and aims to reduce energy consumption by five percent per year. This action also includes retrofitting City-owned street lights to LEDs, maintaining LED signal indications, installing a street lighting control system, and adoption of a dimming policy for street lights.<sup>35</sup>

### 2. *Increase the City's I.T. efficiency.*

Server use, computers, and tablet devices consume a significant portion of electrical plug use. Procuring energy-efficient equipment is a major opportunity, while simultaneously looking for ways to reduce the need for equipment. Server virtualization consolidates server space by optimizing the servers' processing power and allowing servers to run virtual applications. Desktop virtualization removes the actual CPU and places all of the programs, applications, processes, and data on the server and runs them centrally. Third-party cloud-hosting is another strategy that moves data storage external to City control and operations. In cases where the City uses a third-party host, the City will ensure that the power used is environmentally-sound.

### 3. *Continue to install and implement water-efficient landscaping and practices for streetscapes, park sites, City facilities, and City-maintained plantings.*

Water conservation practices include central control systems, drip irrigation, rain sensors, healthy soil management, and leak detection. The City will identify specific opportunities for saving water in streetscapes because these plantings can use a significant amount of municipal water.

# ENERGY DISCLOSURE FOR BUILDINGS:

## *Boosting the Value of Real Estate, Creating Jobs, and Reducing Energy*

Many building owners and operators lack knowledge about the energy performance of their buildings. Making this information more accessible enables the market to factor energy performance into real estate leasing and investment decisions, facilitating demand for energy-efficient buildings and competition to improve energy performance.

An analysis completed by IMT and the Political Economy Research Institute (PERI) at the University of Massachusetts showed that a nationwide energy disclosure policy would:

- Reduce energy costs for building owners, consumers, and businesses by approximately \$3.8 billion through 2015 and more than \$18 billion through 2020.
- Generate more than \$7.8 billion in private investment in energy efficiency measures through 2020, yielding \$3 to \$4 in energy cost savings for every dollar invested.
- Reduce annual energy consumption in the U.S. building sector by approximately 0.2 quadrillion BTUs by 2020, equal to taking more than 3 million cars off the road each year.

Major cities and states now require building owners and operators to comparatively rate the energy performance of their buildings and disclose building energy performance indicators to the marketplace.

As building owners and tenants increase their knowledge and improve their performance, ENERGY STAR certification is more likely to be achieved. The average sale premium is 2 to 5 percent higher for ENERGY STAR rated buildings.



**4.** *Operate and build City facilities according to established high performance standards of EPA's ENERGY STAR and the USGBC's Leadership in Energy & Environmental Design (LEED); pursue certification where feasible and prudent.*

This action will operate and build City facilities and sites to meet the performance standards of ENERGY STAR certification and/or LEED.<sup>36</sup> Both ENERGY STAR and LEED offer high performance guidelines that the City can look to in operating its facilities and sites. By following these standards, regardless of whether City facilities actually are certified, energy and water conservation will increase. The additional step of either type of certification will recognize efforts and impressive achievements, as well as lead by example for the community. Bellevue City Hall has twice earned ENERGY STAR certification, in 2008 and 2010. It is the only City facility that has been certified, out of a handful

of eligible City facilities. The Bellevue Mercer Slough Environmental Education Center was the City's first and, at the time of publication, only LEED Gold-certified new building.

**5.** *Establish an internal Revolving Loan Fund (RLF) to capture savings from efficiency upgrades and fund new projects.*

A revolving loan fund (RLF) is a pool of money designated for funding cost-saving energy efficiency, renewable energy, or other conservation measures over time. A RLF is typically managed by an internal team, and monies are loaned to qualified applicants or departments within a jurisdiction. Savings from projects are used to pay back the loan in a predetermined time frame, thereby making funds available again for new project investments.<sup>37</sup>

**6.** *Establish energy use benchmarking and disclosure requirement for commercial and City buildings with more than 25,000 square feet and multifamily buildings with more than 20 units.*

Energy benchmarking and disclosure ordinances have been passed by two states (California and Washington) and five cities (New York City, Los Angeles, Washington DC, Philadelphia, and Seattle), affecting billions of commercial square feet. Like MPG ratings, transparent energy ratings enable the market to assess building energy performance and identify buildings where energy costs are lower, creating more demand for efficient buildings.<sup>38</sup> Each jurisdiction has a policy that contains unique approaches to implementation. The most common tool used in disclosure is the ENERGY STAR rating system, which is free, is nationally-recognized, and can be easily populated with automated data uploads from PSE. The City of Bellevue will research and pursue the right policy approach for energy use disclosure benchmarking in its local market.

**7.** *Encourage energy and water conservation and green building in Bellevue through the energy code and other tools.*

This action includes leveraging partnerships, providing technical assistance, increasing builder awareness, and considering building incentives. Ensuring energy code compliance is a critical function of the City's development review process. A national study found that every \$1 spent on energy code compliance returns \$6 in energy savings.<sup>39</sup> Throughout most of the United States, building code development, implementation, training, and enforcement have long been underfunded, with energy codes the most underfunded.<sup>40</sup> In Bellevue, that is fortunately not the case. The energy code continues to evolve and it is important to ensure City staff have a high level of training. Bellevue also should continue to adopt the most progressive energy code available. Going beyond energy code compliance involves providing technical assistance and additional resources to encourage green building in Bellevue. Building incentives can also be used to encourage green building projects, such as priority permitting or additional height allowances.

**8.** *Reduce code barriers and streamline permitting processes for green building and renewable energy projects.*

Creating standards for green building and renewable energy projects that enable them to be permitted quickly and easily will lead to greater likelihood that project developers will implement these technologies. Time-intensive permitting costs developers money and creates perceived and real barriers. Analysis of code barriers that exist should be undertaken, resulting in recommendations for barrier removal. For example, as part of a grant from the Department of Energy and the State of Washington, the City of Bellevue has been part of a multi-jurisdictional team to streamline permitting processes for residential solar PV system. In addition, Bellevue will leverage participation in MyBuildingPermit.com (MBP), a multi-agency site, to streamline online permitting processes and share successes with MBP partners and others throughout the region.

**9.** *Move toward real-time energy and water consumption information for customers through electrical "smart-grid" technology and automated meter reads for water use.*

The term "smart-grid" encompasses demand management, instantaneous meter information, load-shedding, peak-pricing, and self-healing networks. Though not directly responsible for power distribution or billing in Bellevue, the City can work with PSE to implement an adaptive electrical "smart grid" because of its potential to increase reliability, efficiency, and awareness of end-user consumption. More frequent meter reading and billing for water use would also enable Bellevue's Utilities Department and its customers to look at consumption profile data for education, awareness, and comparisons, or detecting continuous flow which might indicate a leak.<sup>41</sup> Currently, water meters are read only every other month, making it difficult to identify and correct irregularities in consumption.

## HELPING MAKE SOLAR MORE AFFORDABLE

In 2012, there were an estimated, 23 residential solar arrays in Bellevue. When Don and Ruth Marsh installed solar panels on the roof of their Somerset home in 2010, they cut their annual electric bill by two-thirds. Despite that, Don says solar energy is “not exactly economical.”

According to the Department of Energy, non-hardware costs, also known as “soft” costs, associated with permitting and interconnection make up as much as 40 percent of the total installed cost of a rooftop photovoltaic solar power system. Bringing down this cost could help make solar more affordable and widespread.

Bellevue is working with three other cities (Edmonds, Ellensburg, and Seattle), the state Department of Commerce, and local utilities to establish consistent standards and processes for all utility types and jurisdictions and bring down the costs of installing solar.

Known as the Evergreen State Solar Partnership (ESSP), the team was one of 22 nationwide to receive a grant for the DOE’s Rooftop Solar Challenge. The Solar Challenge is part of Energy’s SunShot initiative, intended to make solar energy cost competitive with other forms of energy by the end of the decade by reducing the cost of installation by about 75 percent.

With the DOE grant, the ESSP aims to reduce administrative barriers to residential and small commercial solar panel installations by streamlining, standardizing, and automating administrative processes.

In addition to shortening permitting processing turnaround times, the ESSP aims to establish online permitting for solar panel installation through MyBuildingPermit.com.



*Who says the sun doesn’t shine in Bellevue? The solar array on Don and Ruth Marsh’s house cut their annual electricity bill by two-thirds.*

### 10.

*Encourage municipal and private market participation in voluntary competitions to drive energy and water conservation.*

Engaging the community in voluntary challenges while providing support and recognition can be a successful strategy for reaching shared environmental goals without promulgating regulations. The City should explore and leverage resources available through existing programs that lead to conservation by residents and businesses. Examples of this approach include the AIA 2030 Chal-

lenge, which sets aggressive targets for the architecture and building community—with the most important goal being that all new buildings and major renovations are carbon-neutral by 2030. Another example is the DOE Better Buildings Challenge: a challenge issued by President Obama to make commercial and industrial buildings 20 percent more energy-efficient by 2020 and accelerate private sector investment in energy efficiency.<sup>42</sup> Striving to meet these challenge targets—and encouraging the private sector to do the same—will help Bellevue reach its GHG reduction targets.

## EASTSIDE SUSTAINABLE BUSINESS ALLIANCE

The Eastside Sustainable Business Alliance is a fusion of Eastside businesses, small and large, with a vision of achieving sustainable operations and positive community impacts. Created by businesses for businesses, ESBA offers the opportunity to work together to lead our region toward the complementary goals of emission reductions, enhanced economy, and superior stewardship.



In addition to providing a forum for education, networking, and creative brainstorming, ESBA facilitates programs to help businesses work together with the community toward a greener future. Programs such as the Eastside Green Business Challenge motivate businesses to realize the financial case for going green while stimulating investments in local resources and clean technology.



The Challenge is a friendly competition among local organizations and seven Eastside cities that helps participants reduce the natural resources they consume and thereby lower costs, enhance their brand, and improve our environment. In 2012, the Challenge helped participating businesses save roughly \$2 million and over 10,000 metric tons of CO2 emissions from energy savings alone.

## 11. *Conduct community awareness programs to encourage energy and water conservation practices and renewable energy purchases.*

Bellevue partnered with PSE and six neighboring cities to implement a successful Home Energy Reports (HER) program (see next page). The City will consider a second phase to that program which would leverage and build upon this success. For example, the City can work with PSE to increase community awareness of renewable energy opportunities. Although most water conservation outreach is now performed by the Cascade Water Alliance, the region's water supplier, Bellevue will continue to encourage water conservation throughout the community with policies, rates, and implementation of outreach and education programs when resources allow.

## 12. *Implement renewable energy projects and study the potential for district energy sub-areas in Bellevue.*

Technologies such as solar photovoltaic (PV) electricity, solar hot water, geothermal, and biomass can generate local, renewable energy. District energy involves the piping of steam, or hot or cold water, such that a single central boiler and/or chiller plant can take the place of lots of smaller ones at individual buildings.<sup>43</sup> There are more than 3,000 district energy systems in North America, most in older downtown cores and on medical, educational, or military campuses. One particularly exciting application of this is using waste heat to heat hydronic pipe loops shared between multiple buildings. District energy projects would require developing an understanding of the potential, codes, and standards, as well as developing (or partnering to develop) expertise on the topic.

# EASTSIDE CITIES PARTNER TO DELIVER HOME ENERGY REPORTS - RESIDENTS SAVE \$4.2 MILLION AND REDUCE GHG EMISSIONS

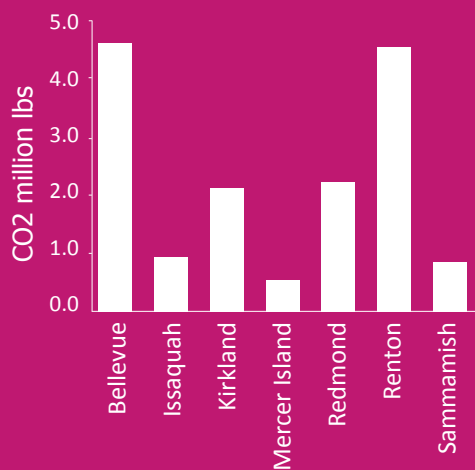
Residents of seven Eastside cities who received bi-monthly reports of their home energy usage reaped total financial savings of approximately \$4.2 million with the Home Energy Reports program.

The 90,000 participating households in the seven-city program together saved 9.3 GWh of electricity, saved 1.3 million therms of natural gas, and prevented the emission of 15 million pounds of CO2. That is the equivalent of taking 1,360 cars off the road for a year or feeding 592 families of four for a year. The program included control groups in order to ensure program results could be attributed to the reports.

## Extraordinary Environmental and Financial Impacts Felt at the Household Level

The program averted 15.6 million lbs CO2 and saved residents \$4.2M.

Averted CO2 Emissions by City



Program Impact - \$ Savings per Household



## What does this add up to?

- 1,360 cars off the road for a year
- 801 houses off the grid for a year
- Average \$45 savings per household
- Aggregate City ROI of 800%
- Enough to feed 592 families of four for a year

1kWh=1.1lbs CO2 1 therm = 11.7 lbs CO2;  
1kWh = \$0.09, 1 therm = \$1.07;

Emissions statistics source: EPA  
Food cost statistics source: USDA



# MATERIALS MANAGEMENT & WASTE





**Goal:** *Inspire systemic change that will reduce negative impacts to land, air, water, materials, and energy resources from existing consumption and waste practices.*

Increased material consumption has historically been linked to rising standards of living, and so too has increased waste. Since 1960, the amount of municipal solid waste generated in the U.S. has nearly tripled. While recycling and composting have increased dramatically over the past several decades, nationally, almost two-thirds of all material discarded still goes to waste in landfills or incinerators.<sup>44</sup> Throwing away valuable material translates into profound economic waste: Americans throw away \$11 billion in packaging materials<sup>45</sup> and \$165 billion in food waste<sup>46</sup> each year.

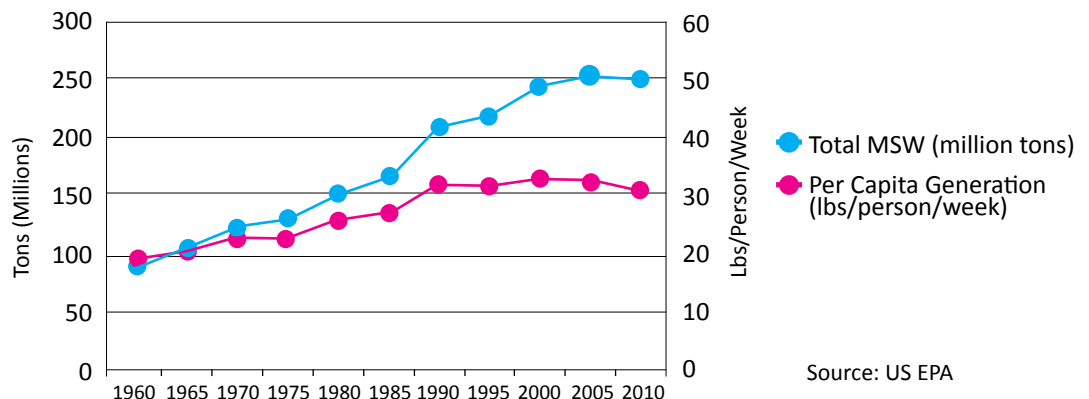
The environmental impacts of materials extend far beyond the landfill or incinerator. From raw materials acquisition to manufacturing, transport, use, and disposal, products have environmental consequences throughout their entire material lifecycle. The U.S. EPA reports that 42 percent of all U.S. GHG emissions can be attributed to the provision of goods and food.<sup>47</sup> Manufacturing and agriculture can require enormous amounts of energy and water, and the majority of industrial processes use chemicals that can pollute air, water, and soil. Recent studies have indicated that children and adults living in the U.S. have widespread exposure and bioaccumulation of many chemicals commonly found in consumer products.<sup>48</sup>

Improving the sustainability of materials management requires both reducing waste through recycling, composting, and waste prevention, and reducing the lifecycle impacts of materials through manufacturing design and consumption choices.

*"Solid wastes" are the discarded leftovers of our advanced consumer society. This growing mountain of garbage and trash represents not only an attitude of indifference toward valuable natural resources, but also a serious economic and public health problem."*

*-Jimmy Carter*

U.S. MSW Generation Rate 1960-2010



# MANAGING MATERIALS INSTEAD OF WASTE

Efforts to reverse waste generation trends and to lower the lifecycle impacts of materials through policies and programs are underway at the federal, state, county, and local levels. Washington State's Beyond Waste Plan aims to eliminate wastes and toxics whenever possible and to use the remaining wastes as resources by 2030. However, a proviso passed by the legislature in 2011 severely reduced funding for state and local governments to work on the Beyond Waste Plan and waste prevention. These budget cuts threaten to reverse positive gains in the following areas from recent years:



## Extended Producer Responsibility

Groundbreaking producer responsibility laws for electronics and mercury-containing fluorescent lamps have become law in Washington and require product manufacturers to finance and implement environmentally sound systems to collect and manage their products at the end-of-life. Other countries around the world have robust and comprehensive systems to take back a whole array of products and packaging, while Washington only has a few such programs.



## Food Scraps Collection

Many municipalities in King County now offer food scraps collection and composting as part of organics collection service. Still, organic materials equal about 55 percent of all materials disposed in landfill that manage our state's waste.<sup>49</sup> Organics and food waste deposited in landfills cause methane generation, a potent greenhouse gas, while composting does not.<sup>50</sup>



## Environmentally Preferable Purchasing

Washington State has established statutes to substantially increase the purchase of recycled-content products by all state and local government agencies in order to develop the market for recycled-content products. Many local and state agencies have formal environmentally preferable purchasing policies that include recycled content and additional considerations such as toxics and greenhouse gases. State and local governments in Washington spend \$4 billion annually on products, a purchasing power that could effectively be leveraged to create a better, healthier environment.<sup>51</sup>

# HOW IS BELLEVUE DOING?

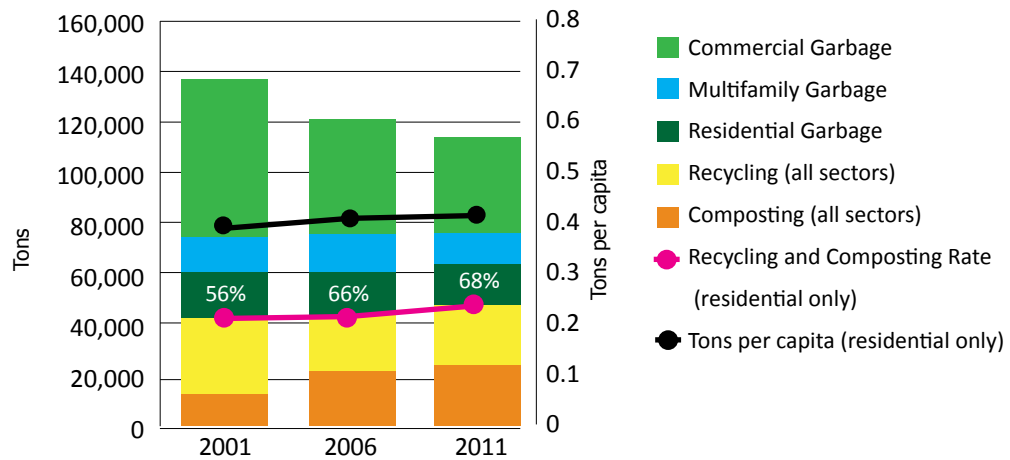
The following data show Bellevue's progress toward the goals of reducing waste and improving materials management.

## Tons of Solid Waste Generated, Recycled, and Composted (%) – Community

Bellevue, along with other communities in King County, has been a leader in recycling and waste reduction for decades. Bellevue's residential recycling and composting rate is 67.7 percent, among the highest in the state.<sup>52</sup> The amount of waste generated per household in Bellevue has declined significantly from a peak of 73.9 pounds per week in 2007. Bellevue residents now dispose of less waste than the state average, but disposal levels are still higher than some other parts of King County.<sup>53</sup>

Recycling rates for businesses and multifamily buildings in Bellevue are much lower than the residential rate, at a combined rate of 24.4 percent of all waste.

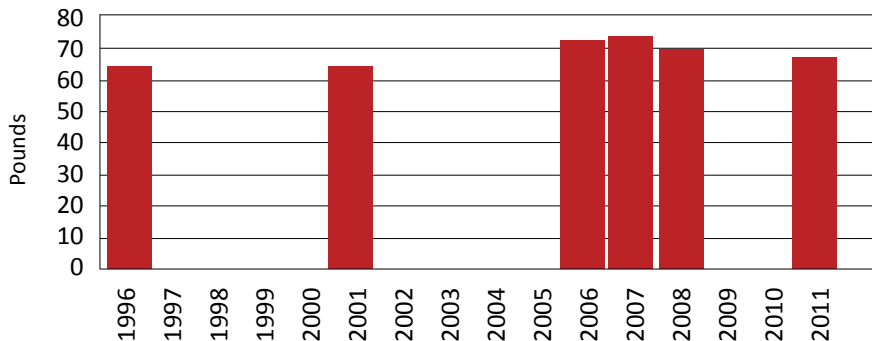
### Community Solid Waste Generation and Diversion, 2001-2011



Source: Bellevue Utilities "City of Bellevue Solid Waste Collection Report 2011" provided by Republic Services. Does not include all commercial waste recycled or composted through private haulers or self haul.

The good news is that total solid waste continues to decline. However, the economic recession of 2008 is likely the biggest driver of the recent decline in waste generation. The true indicator of long-term success will be whether waste generation rates continue to decline as the economy recovers.

### Residential Waste Generated Per Household Per Week (includes garbage, recycling, and yard waste)

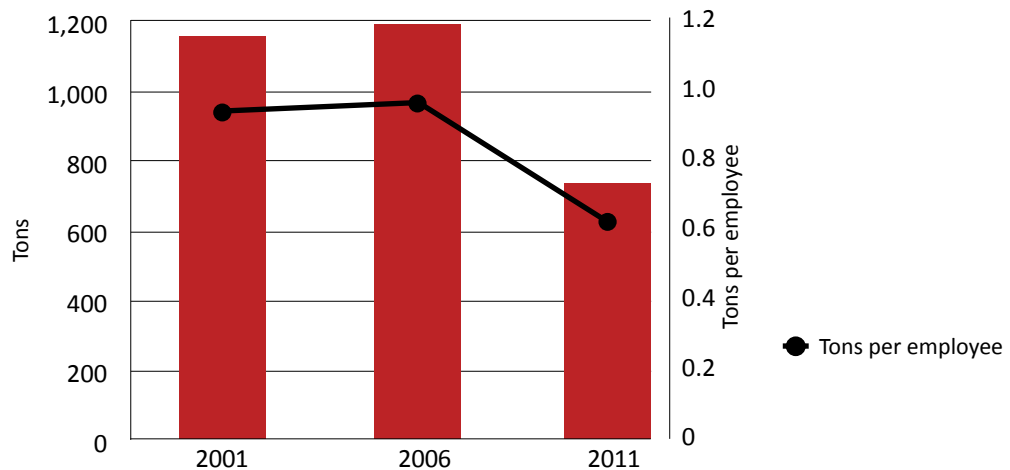


Source: Bellevue Utilities "City of Bellevue Solid Waste Collection Report 2011", provided by Republic Services.

## Tons of Solid Waste Generated, Recycled, and Composted Rate (%) – Municipal

City of Bellevue has been named a “Best Workplace for Recycling” in King County since 2007. It maintains a robust recycling program, including collection for food waste; Styrofoam; batteries; techno-trash; and commingled bottles, cans, paper, and plastic. In 2011, the municipal diversion rate was 37 percent, not including these specially-collected items. Solid waste per employee has decreased significantly since 2001 from 0.946 tons per employee per year to 0.616 tons per employee per year (includes recyclables, food waste, and garbage). Materials diverted in 2011 included 216 tons of recycling and 230 tons of organics.

### Tons Disposed - Municipal (excludes recycling and composting)

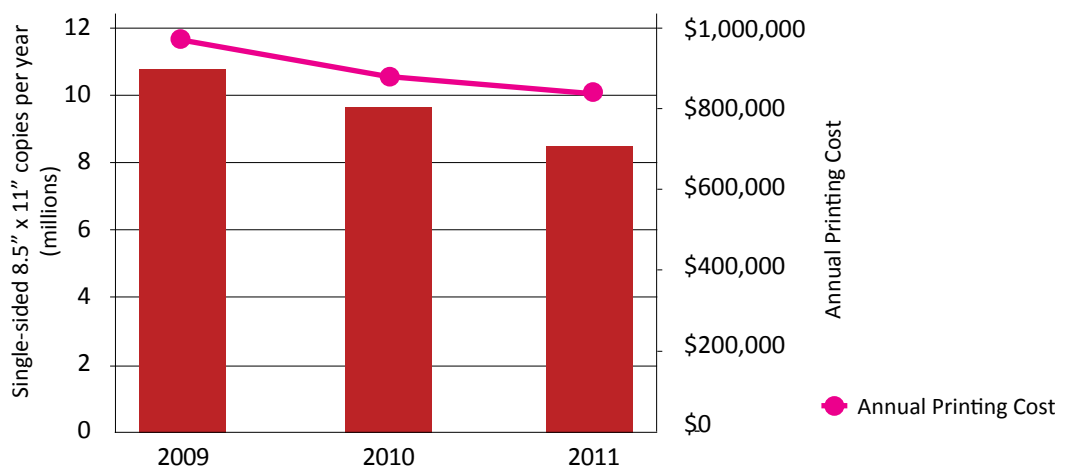


Source: City of Bellevue volume estimates provided by Allied Waste.

## Municipal Purchasing

At the time of publication, Bellevue does not have comprehensive data on the purchase and environmental savings related to the purchase of green products. However, through better materials management actions, paper costs for the City have declined by \$108,000 since 2009, due to a decrease in printing of more than 2.2 million sides of paper.

### City of Bellevue Annual Printing and Printing Costs (excludes offsite jobs)



Source: Copiers NW and Bellevue Finance Reports from Liz Rector.

# STRATEGIES & ACTIONS

The City has identified 11 actions for advancing its objectives and making progress toward its key performance indicators in this category over the next five years. Many of these efforts are underway and should continue or be expanded.

STRATEGIES	INDICATORS	ACTIONS
INCREASE COMMUNITY RECYCLING, COMPOSTING, AND WASTE REDUCTION OPPORTUNITIES	<b>C</b> Tons of solid waste generated	<ol style="list-style-type: none"> <li>1. Provide additional reuse, recycling, and repair opportunities for Bellevue residents and businesses.</li> <li>2. Integrate “toward zero waste” principles in outreach and education materials; promote the reduction of plastic packaging waste.</li> <li>3. Provide City policy support for product stewardship programs as an alternative to ratepayer-funded recycling programs.</li> <li>4. Work to reduce, reuse, and recycle construction waste from building projects throughout Bellevue.</li> <li>5. Improve building codes to require multifamily and commercial buildings to provide sufficient space for recycling and food waste collection, along with garbage.</li> </ol>
	<b>C</b> Recycling and composting rate (%)	
INCREASE MUNICIPAL RECYCLING, COMPOSTING, AND WASTE REDUCTION	<b>M</b> Tons of solid waste generated	<ol style="list-style-type: none"> <li>6. Compost all organics generated by City operations.</li> <li>7. Reduce waste going to landfill generated by City facilities and events.</li> <li>8. Continue programs to educate employees and the organization about our waste generation, recycling, and composting rate.</li> </ol>
	<b>M</b> Recycling and composting rate (%)	
IMPROVE GREEN PURCHASING PRACTICES AND REDUCE MATERIAL CONSUMPTION IN MUNICIPAL OPERATIONS	<b>M</b> Municipal purchasing	<ol style="list-style-type: none"> <li>9. Evaluate and develop green purchasing procedures</li> <li>10. Develop a strategy to reduce consumption of paper products by shifting to electronic documents and file-sharing.</li> <li>11. Operate facilities to LEED-certified O&amp;M standards for Materials and Resources and Indoor Environmental Quality criteria.</li> </ol>

**1.** *Provide additional reuse, recycling, and repair opportunities for Bellevue residents and businesses.*

Innovative recycling and composting programs such as “Repair Cafes” or tool lending libraries deliver the simultaneous benefits of reducing waste, building social networks, strengthening community resilience, and helping people develop new skills. Such programs may be supported through the City’s Neighborhood Outreach grants. The City’s new solid waste contract (to start in 2014) may also include a new “Neighborhood Recycling Center” for drop-off of unusual and bulky recycling items set up by the contracted hauler.

**2.** *Integrate “toward zero waste” principles in outreach and education materials; promote the reduction of plastic packaging waste.*

King County adopted a policy to work toward Zero Waste of Resources by 2030, meaning that materials of value, whether for reuse, resale, or recycling, won’t be put in the garbage and end up in the landfill. In order to align Bellevue with this goal, the Utilities Department will promote “toward zero waste” themes in educational materials about garbage, food waste, and recycling. The City continues to seek and favor voluntary approaches over regulatory ones to reach its objectives.

**3.** *Provide City policy support for product stewardship programs as an alternative to ratepayer-funded recycling programs.*

Product stewardship is “an environmental management strategy that means whoever designs, produces, sells, or uses a product takes responsibility for minimizing the product’s environmental impact throughout all stages of the product’s life cycle.”<sup>54</sup> Ratepayers have been historically burdened with the costs of manufacturers’ failures to design for end-of-life by having to throw away their products as garbage.<sup>55</sup> This strategy aligns with regional initiatives, including legislation, and recommends that the City become a member of the Northwest Product Stewardship Council. City policy support could greatly expand the statewide and local recycling opportunities for numerous materials, including carpet, paint, pharmaceuticals,<sup>56</sup> mercury-containing lamps, and computer peripherals.

**4.** *Work to reduce, reuse, and recycle construction waste from building projects throughout Bellevue.*

Recycling of construction waste is cheaper than solid waste disposal. It will improve builders’ bottom line if they can efficiently sort and collect recyclables.<sup>57</sup> However, many builders still dispose of construction waste in the landfill. Construction waste is 17.6 percent of the state’s commercial waste stream and 12.8 percent of the state’s residential waste stream.<sup>58</sup> This strategy ensures that builders take advantage of rate-based incentives in order to increase construction and demolition (C&D) diversion. One option is to provide recycling checklists to builders during the permitting process. In addition, the City will lead by example and recycle C&D waste at all City construction or demolition projects. In addition, promoting waste prevention practices, deconstruction instead of demolition, and salvage can greatly reduce the amount of waste to be managed, recycled, and landfilled.

**5.** *Improve building codes to require multifamily and commercial buildings to provide sufficient space for recycling and food waste collection, along with garbage.*

Without sufficient space for recycling and food waste collection, tenants cannot easily divert materials from the waste stream. In addition, sufficient space allows for safe, efficient, and aesthetically tolerable collection of waste materials, which is especially important in the downtown business district.

**6.** *Compost all organics generated by City operations.*

Diverting organics from the landfill will reduce methane generation in regional landfills (methane is 21 times as potent as carbon dioxide for its global warming potential) and turn “waste” material into a beneficial soil amendment. Organics recycling has been an excellent success story locally—coupling jobs and industry with impressive environmental results—but the City can go further in its own operations. Major opportunities include composting all paper towels at City Hall, including hand towels in the restrooms, and expanding food waste composting to all City facilities and events.



Workers place recycled asphalt shingles on 164th Ave from NE 8th to SE 14th in early October. The contractor placed 2,898 tons of asphalt. 3% of the aggregate weight of the asphalt mix was comprised of recycled asphalt shingles.

## PAVING THE WAY TO ZERO WASTE WITH RECYCLED ASPHALT SHINGLES

The asphalt industry has been using Recycled Asphalt Pavement (RAP) in the manufacture of new pavement for 30 years. In the 2012 Overlay Program, the City used 20 percent recycled asphalt pavement in the asphalt mix design for the new surface. RAP made up 20 percent of the average asphalt mix by volume, with the remainder comprised of virgin aggregate and asphalt cement binder. As a result the 2012 Overlay program reused approximately 6,000 tons of recycled asphalt in the new roadway surface.

A new ingredient being utilized for pavement is Recycled Asphalt Shingles (RAS). Asphalt roofing shingles are typically thought of as a problematic waste. More than 40,000 tons of these shingles are generated annually in King County, which make up 10-12 percent of the construction and demolition (C&D) waste. However, the asphalt content and the fibers in the shingles make them a promising recycled element that can be used in new pavement.

The 2012 Overlay Program resurfaced 164th Avenue between SE 14th and NE 8th, Lakeside Industries used 3 percent Recycled Asphalt Shingles (RAS) and 15 percent Recycled Asphalt Pavement (RAP). Although this is the first time this mix design has been utilized in Bellevue, a 2009 King County overlay pilot project that used recycled asphalt shingles is performing well.

The bid price for the asphalt containing the shingles is the same price as the other asphalt used on the project; savings may be realized on future projects. Missouri found that the use of recycled shingles saves \$3-5 per ton of finished asphalt mix. A typical resurfacing project in Missouri uses about 30,000 tons of asphalt, for a savings of \$90,000 to \$150,000 per project.

In Bellevue, this one resurfacing project will keep nearly 100 tons of recycled asphalt roofing out of the landfill. 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). That means a savings of 13 MTCO<sub>2</sub>e, or the equivalent of removing 2.5 cars from the road, for a single paving project.

### 7. Reduce waste going to landfill generated by City facilities and events.

The City will continue to strive to provide 100 percent recyclable, compostable, or durable service-ware and packaging at all City events in order to reduce non-recyclable waste going to landfill. A creative and potentially cost-saving program is to phase-out custodial trash pick-up at individual cubicles in the custodial contract in 2014, wherein employees voluntarily service their own garbage generated in their cubicles. This would cut down on the use and disposal of liners and underscore that through robust recycling and composting service, trash service can be significantly reduced.

### 8. Continue programs to educate employees and the organization about waste generation, recycling, and composting rate.

Recycling education needs to be regularly deployed as new materials and procedures change over time and as new employees join the organization. Feedback about progress is a proven motivator to keep up the organization's good work and/or to change behavior and course. Periodic waste audits can help understand what is being thrown away and ensure corrective action over time.



## ENVIRONMENTALLY PREFERABLE PURCHASING SAVED KING COUNTY \$1.54 MILLION IN 2011

Environmentally preferable purchasing (EPP) is defined by the US EPA as purchasing of products and services “having a lesser or reduced effect on human health and the environment when compared with competing products that serve the same purpose. This comparison may consider raw materials acquisition, production, manufacturing, packaging, distribution, reuse, operation, maintenance, or disposal of the product.”

King County’s Environmentally Preferable Products Purchasing Policy (KCC 18.20), originally established in 1989, was updated in 2011 to include revisions for paper reduction and the purchase of 100 percent recycled paper, as well as electronics recycling and reporting requirements. The amended policy directs County agencies to buy environmentally preferable products “whenever practicable.”

In 2011, King County agencies purchased \$60 million worth of environmentally preferable products, saving \$1.54 million compared to the cost of conventional products. The savings are both the result of reduced initial purchase cost and avoided replacement cost due to durability. Often, there are additional savings achieved through less maintenance or reduced energy and water use over time.

### 9. Evaluate and develop green purchasing procedures.

Green purchasing procedures, coupled with an educational and outreach effort, will help City departments consider environmental factors when buying commodities such as paper, paint, chemicals, computers, appliances, fuel, energy, furniture, compost amendments, and office supplies. Green procurement doesn’t necessarily require extra cost or in some cases can be less expensive than traditional products.<sup>59</sup> Green procurement also strives to reduce the amount of material purchased through reuse, salvage, maintenance, repair, new technologies, and smarter processes. Many jurisdictions nationwide have implemented green procurement policies and programs and the City can either replicate this criteria and/or piggyback on available contracts executed by the City of Seattle, King County, or the State of Washington.

### 10. Develop a strategy to reduce consumption of paper products by shifting to electronic documents and file-sharing.

This action includes identifying major areas of paper consumption at the City and savings opportunities such as field inspections, Secure Print, Council packets, Budget One, and contract routing. An interdepartmental team will work to identify and remove barriers to paper reduction. In addition, staff will continue to work with the copier service provider to collect data and report to the organization on monthly and annual paper-use impacts.



11.

*Operate facilities to LEED-certified O&M standards for Materials and Resources and Indoor Environmental Quality criteria.*

LEED is an industry benchmark for green buildings and operations. Prerequisites for LEED O&M within Materials and Resources and Indoor Environmental Quality are adoption of a Sustainable Purchasing Policy, Solid Waste Management Policy, and Green Cleaning Policy (policies which align well with other ESI strategies recommended in this category). Following the O&M LEED checklist will help City facilities along the path to achieving a LEED rating (when and if the City seeks to certify its facilities). Additionally, documenting the City's existing hazardous chemical practices and procedures in greater detail will identify opportunities for improvement. Within this action, the City will also consider third-party certification such as EnviroStars for hazardous and solid waste prevention and management.



## ON THE PATH TO PAPERLESS

In October 2011, Bellevue implemented Phase 1 of a digital permit application system for submission of the electrical, mechanical, and plumbing permits that require plan review called "Paperless Permitting." Applicants can submit their forms online 24 hours a day and have the processing staff review the application materials and send revision requests all online. 35 percent of all permits now occur online. After the Phase 2 implementation of the remaining permit types in July 2013, the City anticipates that at least 50 percent of all applications will occur online within one year.

The Phase 1 implementation has improved the customer experience by reducing the reviewing process for some applications. In addition, applicants are realizing a reduction of their expenses and resources by not having to submit multiple paper copies of the plan sets and other related documents. An estimated 322,000 24"x36" sheets and 76,500 8.5"x11" sheets will be saved annually once the 50 percent electronic submission level is achieved. Collectively, 97,500 miles previously required for permits will not be driven. Bellevue's Paperless Permitting reduces community emissions by 46 MTCO<sub>2</sub> annually and saves applicants over \$600,000 in printing and fuel costs,\* not including the costs of travel time or cost savings from improved processing times.

\*Assumes \$0.30 per square foot of printing and \$0.10 per 8.5"x11" sheet; plus \$3.50 in fuel costs

# ECOSYSTEMS & OPEN SPACES



**Goal:** *Repair the integrity of natural systems in and around Bellevue to the highest of standards, which will allow residents, fish, and wildlife to thrive.*

Healthy functioning ecosystems provide clean air, drinkable water, food, recreation, stormwater management, inspiration, and quality of life, as well as habitat for other species. Rich natural resources and landscapes have enticed many residents and businesses to call Bellevue home.

Urban tree canopies act as a natural sponge and filter for drenching rains and run-off, providing millions of dollars worth of stormwater management services. They provide oxygen for the planet, a playground for adventurous hikers, and a buffer for urban noise and visual pollution. Development projects that result in tree loss rob the community of all of these critical assets, particularly when there is no replacement plan.

Beyond the trees themselves, vegetation and soils in natural areas reduce the velocity, temperature, and amount of water flow during storms. Hard surfaces such as asphalt and pavement increase stream scouring, pollution, and temperature loads. Water temperature is the number one impairment for waterways in Washington State, with pathogens being second. Impervious surface area in Bellevue is 46 percent<sup>60</sup> of total land area – a value that exceeds the accepted threshold for stream channel stability.<sup>61</sup>

Salmon still migrate from freshwater to salt water in the Northwest, and play a vital role in a long and fragile food web. Yet some species are in serious decline. Throughout Puget Sound, only 22 of at least 37 historic Chinook populations remain. The remaining Chinook salmon are at only 10 percent of their historic numbers, with some down lower than 1 percent.<sup>62</sup>

Since 1967 the average population of 20 North American common birds surveyed in the U.S. has fallen by 68 percent, from 17.6 million to 5.35 million; some individual species dived as much as 80 percent.<sup>63</sup> A variety of factors—including reduced habitat, agricultural development, house cats, and glass skyscrapers—have contributed to the dramatic decline of common birds in North America. Warming global temperatures threaten to push avian species out of their normal territories, causing further stress in the future.

*For a planting cost of \$250-\$600, a single street tree provides over \$90,000 of direct benefits (not including aesthetic, social and natural) in the lifetime of the tree.*

*-Dan Burden, Co-Founder Walkable Communities, November, 2008*



## THE HEALTH BENEFITS OF PARKS AND TREES

Several studies have documented the economic burden of physical inactivity and obesity. Recent research suggests that access to parks can help people increase their level of physical activity. More active people save about \$250 per year on their medical bills compared to inactive people, and active seniors save about \$500. The Trust for Public Land found that in Sacramento, 77,617 residents saved \$19.8 million in 2007 because of park exercise.<sup>64</sup>

In a variety of human clinical trials, exposure to nature and greenery has been shown to significantly reduce people's stress levels and helped them better withstand high-stress situations, including pregnancy. Lower maternal stress has a positive effect on healthier babies. Researchers in Portland used satellite images to compare tree cover around the houses of 5,696 women who gave birth in Portland in 2006 and 2007 and found pregnant women living in houses with more trees were significantly less likely to deliver undersized babies.<sup>65</sup>

## PROTECTING PRECIOUS ASSETS & RESOURCES

Bellevue residents highly value living in a "City in a Park." The 320-acre Mercer Slough Nature Park, Lake Washington's largest remaining wetland, provides an oasis of outdoor recreation and educational enrichment to urban dwellers.<sup>66</sup> Bellevue has an impressive 82 miles of streams, which foster fish and wild-life populations that an entire region depends on. When asked in a 2009 survey, 97 percent of residents believed that the parks and recreational opportunities in Bellevue enhance Bellevue's overall quality of life.

However, sustaining the environmental assets that our residents and businesses value depends on actions in and beyond Bellevue's borders. For instance, salmon returning to Bellevue must travel through Lake Union and Lake Washington. Of Bellevue's 26 basins, 17 drain eventually to Lake Washington, and the other 9 to Lake Sammamish. Local choices have broader implications for regional quality of life, and vice versa.

The citizens, businesses, and governments of the Puget Sound have enacted policies dedicated to preserving critical ecosystems and open space. Bellevue was one of the first cities in the country to adopt an open stream policy and critical areas ordinance in the 1980s. The state's 1990 Growth Management Act requires all cities and counties in the state to designate and protect wetlands, frequently flooded areas, farm lands, forest lands, and other natural resource areas. Once adopted, the 2012 Stormwater Management Manual for Western Washington will provide the most detailed and stringent guidelines to date for managing regional water flows during storm events. The manual includes requirements for the most populated areas to use low impact development (LID) for new and redevelopment and to begin monitoring improvements to water quality.<sup>67</sup>

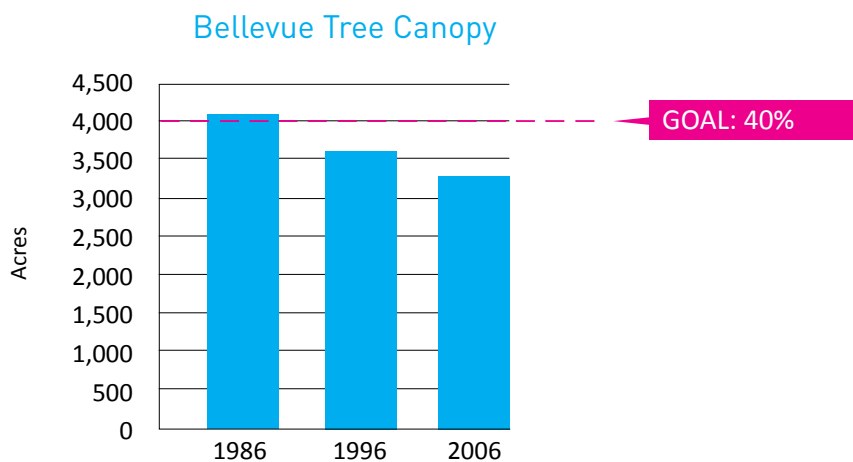
The Bellevue community is working together to enhance and sustain natural resource functions through low impact development (LID), restoration, education, and stewardship.<sup>68</sup> In 2012, over 1,500 community volunteers planted more than 1,000 trees and shrubs and renovated over 7,000 feet of trails throughout Bellevue. Diverse programming such as the Stream Team and Master Naturalist program ensures residents have the opportunity to fully engage with their natural surroundings.

# HOW IS BELLEVUE DOING?

Many programs and policies site goals for maintaining Bellevue’s natural systems, including the *City’s Comprehensive Plan*.<sup>69</sup> Several key trends tell the story of how Bellevue is doing to restore, protect, and enhance these ecosystems in and around the City.

## Tree Canopy Citywide [%]

Tree canopy in Bellevue has decreased 20 percent since 1986, a loss equivalent to \$15 million in lost stormwater services and \$68,000 per year in lost air quality removal services.<sup>70</sup> Continuing on this trend will quickly jeopardize Bellevue’s cost of living, quality of life, and image as a City in a Park. Bellevue’s existing tree canopy is also a critical part of the equation for greenhouse gas reductions, storing 332,000 tons of carbon in wood.<sup>71</sup>



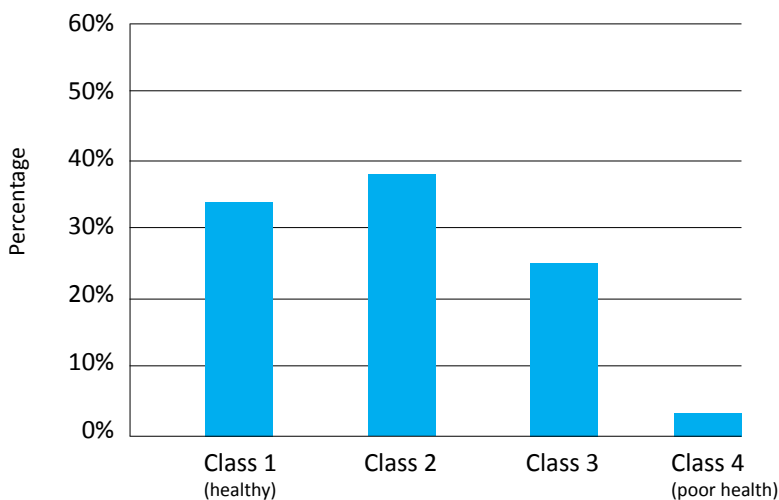
Source: American Forests. (2008). Urban Ecosystem Analysis, City of Bellevue, Washington.

## Trees on Public Lands

Bellevue Parks Natural Resource Division manages approximately 961 acres of deciduous forests. In 2011, Parks completed the U.S. Forest Service i-Tree/UFORE (Urban Forest Effect Model) Ecosystem Analysis of Park & Open Space natural areas. The report found that Parks’ forested areas have 257,000 trees and an overall canopy cover of 74.3%. This natural system works hard for the City and is an extremely valuable asset – pollution removal from these trees is 136 tons/per year, valued at \$961,000/per year. They store 72,900 tons of carbon at a value of \$1.34 million. They sequester an additional 2,400 tons of carbon per year at a value of \$44.1 thousand per year. Their structural value is \$438 million (value based on the physical resource itself, e.g., the cost of having to replace a tree with a similar tree).<sup>72</sup>

The health of these forests is of similar importance to the size. The UFORE methodology classifies forests into health conditions ranging from 1 (highest) to 4 (lowest). Forest Condition monitoring indicates that 72% of Bellevue Park System’s forested natural areas are in Class 1 or Class 2 health categories (approximately 1,132 acres). From 2009 to 2012 Bellevue’s Forest Management Program has restored and enhanced over 50 acres of degraded Class 3 and Class 4 sites and planted over 10,000 trees and 100,000 native shrubs and ground cover plantings.<sup>73</sup>

### Public Urban Forest in Class 1 and 2 Condition, 2011



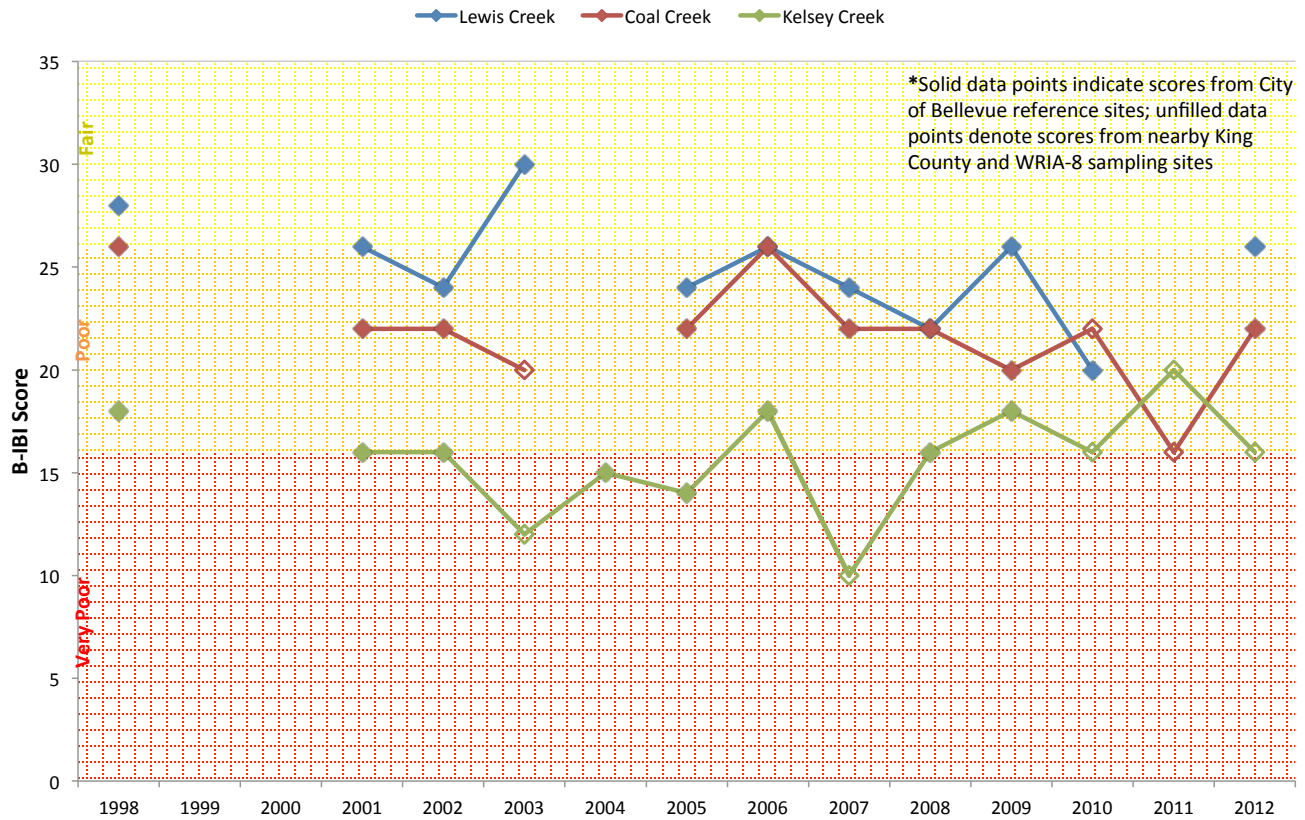
Source: EarthCorps: Forest Condition Assessment Model Analysis. (2012).

## Stream Habitat

While there are no urban standards or requirements for monitoring stream habitat, there are three evaluation criteria that can be used to assess the condition of a stream: 1) the Benthic Index of Biotic Integrity (B-IBI); 2) the amount of large woody debris in the stream channel; and 3) the quality and quantity of pools. The goal of Bellevue’s Utility Department is to continue to maintain and improve stream habitat conditions and B-IBI scores. Trend analysis of woody debris and pools has been recommended in the draft Storm and Surface Water System Plan and will be developed in the future.

B-IBI is a quantitative method for determining and comparing the types, numbers, and sensitivity of aquatic organisms and an indirect measure of the quality of stream habitat. It provides a single, integrated score that ranges from very poor (10) to excellent (50). Scores below 36 are currently considered biologically impaired.<sup>74</sup> Bellevue B-IBI scores rank in the impaired category, similar to all urban streams in the Puget Sound lowland.<sup>75</sup>

## B-IBI Scores for Three Major Bellevue Creeks



Source: City of Bellevue Utilities Department.

Note: In trend analysis of scores from the City of Bellevue between 1998 and 2007, there was no statistically significant trend in the samples.<sup>76</sup> Variation in B-IBI scores may be due to human influences as well as natural differences in the watersheds. The next B-IBI statistical trend analysis is proposed to occur with the next Basin Fact Sheets update.

## Salmon Population

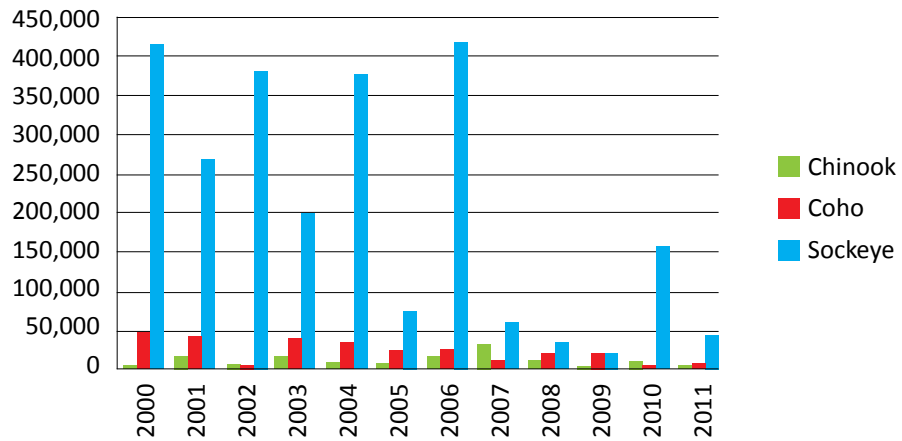
Bellevue's Utilities Department conducts fish monitoring in its streams under its summer juvenile fish monitoring program and its salmon spawner survey program as allowed.

The summer fish monitoring provide indications of local habitat conditions, as the presence of the fish are not affected by harvest or ocean conditions. Results show that native fish diversity and abundance have been maintained in most surveyed streams, with the exception of juvenile coho, which have been decreasing over time.

Counting spawning salmon (the proportion of marked hatchery fish to unmarked native spawning fish) and redds (egg nests) provides an indication of the success of salmon, but can be confounded by changes in harvest and ocean conditions. The results of spawning salmon in Bellevue fluctuated greatly between years. These fluctuating return numbers indicate that the populations may not be able to sustain spawning in the streams.

From a more regional perspective, salmon fish counts at the Chittendon Locks, through which all fish must travel in their transition from ocean to lakes and streams, show significant decline, particularly of the sockeye species.<sup>77</sup>

## Chinook, Coho, and Sockeye Salmon Counts in Chittenden Locks from 2000 through 2011



Source: Anchor QEA, LLC prepared for Bellevue Utilities Staff (April 2012) "2011 Salmon Spawner Surveys Kelsey Creek, West Tributary, Richards Creek, and Coal Creek Bellevue Salmon Spawner Surveys" pg 28

## Acres of Wetlands

Wetlands are integral features of Bellevue's urban landscape and the local hydrologic cycle. Wetlands reduce floods, contribute to stream flows, and improve water quality. Wetlands also provide habitat for birds, amphibians and other wildlife. Each wetland provides various beneficial functions, but not all wetlands perform all functions, nor do they perform all functions equally well. Urbanization in the watershed diminishes the function of individual wetlands by increasing stormwater volume, reducing runoff quality, isolating wetlands from other habitats, and decreasing vegetation. An accurate, current account of the number of acres in wetlands is very difficult to achieve due to fluctuating conditions of wetlands year to year and mapping challenges. In addition, baseline datasets are difficult to assemble. However, it is estimated that as of 2012, Bellevue had approximately 600 acres of wetlands. In 2001, King County had 34,000 acres of wetlands, which was a small increase from 1992.<sup>78</sup> Wetlands are also rated per their ecological health and level of disturbance on a scale from 1 (best) to 4. There are few class 1 wetlands in Bellevue.

## Number of Reduced Pesticide and Pesticide Free Places

By definition, pesticides harm living organisms and the environment if released. The benefits of pesticides can outweigh risks in some cases, such as controlling noxious, disease-carrying, or invasive species. Depending on the pesticide, amount, and timing of exposure, pesticides can affect the structure and functioning of the human brain and nervous system; or contribute to cancer, birth defects and hormonal and endocrine abnormalities. Scientific studies are starting to link even low levels of pesticide exposure to disease, especially during childhood development, and using pesticides with precaution and prudence is increasingly warranted.<sup>79</sup>

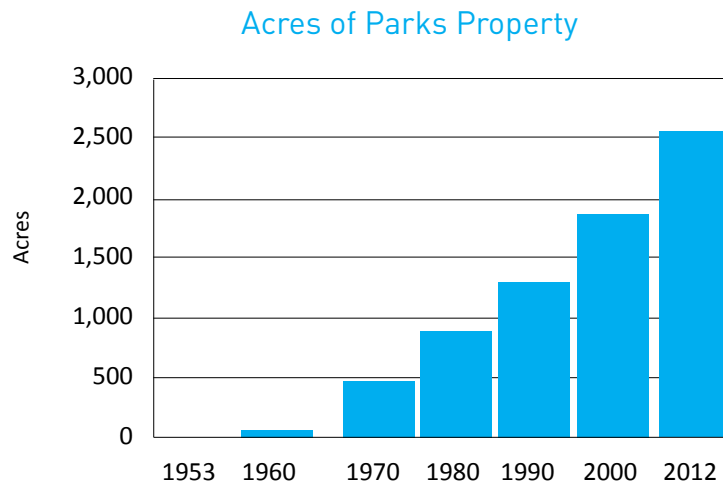
The City of Bellevue and its contractors are required to use pesticides in accordance with the City's Integrated Pest Management (IPM) program standards, adopted in 1997. The IPM program provides policy level guidelines that encourage reduction of pesticide use to the lowest possible amounts. As an example, since 2007, only 4 applications of spot treatments using broadleaf herbicide occurred in Downtown Park. In addition, use of pesticides within 50 feet of lakes, streams, and wetlands has been eliminated and the majority of City owned agriculture land is managed organically. The local Hazardous Waste Management Program in King County (LHWMP) publicizes parks as "Pesticide-Free or Pesticide-Reduced" at [www.lhwmp.org/home/PFParks/index.aspx](http://www.lhwmp.org/home/PFParks/index.aspx). In 2013, 23 Bellevue Parks will be listed on King County's map as pesticide-reduced places.



## Acres of Parks and Open Spaces

As of 2010, Bellevue's parks system included 74 developed park sites covering 562 acres, and the City's open space system included 1,800 acres of forests and natural areas and 60 acres of privately owned but publically managed and accessible Native Growth Protection Areas.<sup>80</sup> Although many of these parks are not ecologically diverse, the health and economic benefits of parks to the community are significant (see text box on page 60).

As of September 2012, there were 2,550 acres of Bellevue parks property.












Source: City of Bellevue Parks Department

## Air Quality

Fine particulate matter less than 2.5 micrometers in diameter (PM2.5) contributes to increased respiratory disease, decreased lung function, heart problems, and premature death. The greatest contributing source to PM2.5 in the Puget Sound area is wood smoke. While wood smoke contributes the greatest mass of PM2.5, particulate matter from diesel engines is the most highly toxic. Bellevue's air quality downtown has slowly improved with regard to PM2.5 since 2003. Overall, the number of unhealthy days and moderate days has declined in King County.<sup>81</sup>

# STRATEGIES & ACTIONS

The City has identified 16 actions for advancing its objectives and making progress toward its key performance indicators in this category over the next five years. Many of these efforts are underway and should continue or be expanded.

STRATEGIES	INDICATORS	ACTIONS
INCREASE TREE CANOPY CITYWIDE	 Tree canopy citywide %	<ol style="list-style-type: none"> <li>1. Research, develop, and implement policies to reverse tree canopy loss trends and restore and maintain the function of existing wetlands.</li> <li>2. Conduct gap analysis and develop specific strategies for forest canopy sub-areas and zones within Bellevue.</li> <li>3. Address the loss of tree canopy on private land in Bellevue.</li> <li>4. Develop a specific right-of-way (ROW) strategy to retain and increase tree canopy.</li> </ol>
	 Trees on public lands	
IMPROVE ECOLOGICAL CONDITIONS FOR FORESTS, STREAMS, WETLANDS, AND WILDLIFE	 Stream habitat	<ol style="list-style-type: none"> <li>5. Improve the health of existing forests and wetlands by removing invasive species, improving the health of native trees, and reducing soil compaction.</li> <li>6. Monitor and report on the health of public urban forests, stream habitat, and fish.</li> <li>7. Conduct a coordinated outreach and education campaign for residents and businesses.</li> <li>8. Build, connect, and protect contiguous trails and wildlife habitat corridors.</li> <li>9. Create healthy stream habitats by removing stream passage barriers, adding wood and pools, reducing scouring flows, and reducing stream temperature. Resume habitat assessment monitoring according to Endangered Species Act guidelines.</li> <li>10. Establish a cross-departmental effort to develop an Aquatic Habitat Plan and establish clear objectives and roles for stream health.</li> </ol>
	 Salmon population	
	 Fish barriers removed	
IMPROVE NATURAL STORMWATER RETENTION SYSTEMS AND REDUCE CHEMICAL USE	 Acres of wetlands	<ol style="list-style-type: none"> <li>11. Maintain and increase pervious surfaces and natural stormwater retention features throughout the City.</li> <li>12. Continue to ensure City and contracted staff use Integrated Pest Management (IPM) techniques, leading to reduced use of pesticides, and promote the benefits to the community.</li> </ol>
	 # of reduced pesticide and pesticide free places	
SUPPORT PRESERVATION OF OPEN SPACE AND AGRICULTURE	 Acres of parks and open space	<ol style="list-style-type: none"> <li>13. Preserve land for open spaces, forests, parks, and agriculture.</li> <li>14. Support local agriculture through partnerships and community events.</li> </ol>
IMPROVE AIR QUALITY	 Air quality	<ol style="list-style-type: none"> <li>15. Identify and reduce sources of particulate matter affecting Bellevue's air quality.</li> <li>16. Reduce idling through infrastructure improvements, education, and policy.</li> </ol>

**1.** *Research, develop, and implement policies to reverse tree canopy loss trends and restore and maintain the function of existing wetlands.*

Examples of policy tools that can reverse tree canopy loss include SEPA checklists, wetland mitigation banking, and Native Growth Protection Easements/Areas,<sup>82</sup> although certain policy adjustments may be needed, as well as more follow-up and enforcement. For example, while the City has policies in place to protect wetlands, some illegal development continues to encroach on these remaining vital areas and the City must remain proactive to prevent this. The functional benefits of wetlands are dependent on being located in the right place, containing the right vegetation, with the right soil type. Therefore, the City will continue to monitor and prevent loss of both wetland acres as well as wetland function.

**2.** *Conduct gap analysis and develop specific strategies for forest canopy sub-areas and zones within Bellevue.*

The overall target for Bellevue is a tree canopy of 40 percent; as of 2007, the canopy is at 36 percent. Bellevue's existing canopy falls short of American Forests' recommendations in all areas, but some are in steeper decline than others.<sup>83</sup> The types of trees present in Bellevue's canopy affect stormwater retention value as well (e.g., deciduous vs. coniferous). In addition to creating a plan for the sub-areas and tree type, the City plans to also develop and implement an action plan for the Central Business District in Downtown on soil health, street plantings, and other tree management practices.

**3.** *Address the loss of tree canopy on private land in Bellevue.*

Private land decisions are a significant reason for the decline in tree canopy in Bellevue. The City needs to develop tools to encourage residents to make environmentally beneficial decisions on private land, such as appropriate land use incentives, as well as outreach and education.

**4.** *Develop a specific right-of-way (ROW) strategy to retain and increase tree canopy.*

The City actively manages 9,640 street trees planted on roughly 200 acres of right of way. These formal streetscapes are valued at over \$48 million dollars in terms of replacement costs and \$12 million in terms of stormwater retention. With over 4,000 existing acres of ROW land in Bellevue, an enhanced strategy to put these spaces to work will save money, among other benefits. The American Forests Urban Ecosystem Analysis found that a 5 percent increase in ROW tree canopy would provide an additional 1.9 million cubic feet in stormwater runoff mitigation, valued at \$3.7 million.<sup>84</sup>

**5.** *Improve the health of existing forests and wetlands by removing invasive species, improving the health of native trees, and reducing soil compaction.*

This action focuses on improving the physical conditions of Bellevue's urban forest and removing threats to long-term health. Bellevue currently successfully partners with community volunteers for native plantings and invasive species removal. Bellevue will continue to engage volunteers in tree canopy restoration projects and explore recruitment of other partners such as the Washington Conservation Corps, AmeriCorps, and Earth Corps, as well as businesses from the Eastside Sustainable Business Alliance, or others.

**6.** *Monitor and report on the health of public urban forests, stream habitat, and fish.*

This action encourages continued collection of data on the health of Bellevue's natural ecosystems. It also recommends engaging new audiences with the information and presenting it in a more meaningful way. The City will publicly report tree canopy coverage statistics through websites and City Parks' visitor centers, and will regularly engage City policy makers with the information. Bellevue Utilities operates a stream health monitoring program that tracks B-IBI index figures and fish counts and uses volunteers to collect the data. Resuming aquatic habitat assessment monitoring according to Endangered Species Act guidelines is also encouraged. These and other efforts by the Bellevue Utilities volunteer program increase local knowledge and ownership of local stream habitat and more accurate trend analysis.

**7.** *Conduct a coordinated outreach and education campaign for residents and businesses.*

One example is to continue promotion of the “Puget Sound Starts Here” campaign, a social media endeavor supported by a consortium of 57 cities and counties under the state’s Puget Sound Partnership. Coordinating the Parks and Utilities departments’ current educational efforts (Master Naturalists, Park Rangers, and Stream Team volunteers) will bring an interdisciplinary perspective on issue areas of streams, forests, stormwater, and species to community audiences. The Local Hazardous Waste Management Program in King County (LHWMP) also advises businesses on proper hazardous waste management and waste reduction. Bellevue will continue to promote these technical assistance resources and encourage improvement through challenge and recognition programs.

**8.** *Build, connect, and protect contiguous trails and wildlife habitat corridors.*

Roads and large areas of development can create barriers to wildlife movement. Connected habitat is critically important for providing a sufficient “home range” for species and preventing isolation of animal populations. Roads and large areas of development also create barriers for bicyclists and pedestrians. Trails that encourage

exercise and non-auto-dependent travel are connected, well-planned, and well-protected from the noise and threat of motor vehicles. The Greenways Mountain-to-Sound is one such regional project, and Bellevue is actively trying to close gaps in the trail system that will run 100 miles along I-90.<sup>85</sup>

**9.** *Create healthy stream habitats by removing stream passage barriers, adding wood and pools, reducing scouring flows, and reducing stream temperature. Resume habitat assessment monitoring according to Endangered Species Act guidelines.*

Urban stream habitats are threatened by many factors: scouring flows, warmer temperatures, fecal coliform, blockages such as unnatural weirs and dams, and culverts. High velocity run-off from hard surfaces (streets, asphalt, roofs) occurs more frequently as a city urbanizes. In contrast to run-off that is slowed down by vegetation and soil absorption, high velocity flows pick up particles that scour the stream and destroy aquatic habitat for microscopic animals and fish. Warmer stream temperature is the most frequent cause of stream and river impairment in Washington and results from run-off from asphalt and unshaded streams.<sup>86</sup> With the Utilities Department in the lead, the City will comprehensively work to address priority issues through a variety of programs.



## STREAM ENHANCEMENTS

In 2012 there were 22 publicly owned culverts/weirs with fish passage problems that the City is trying to fix. The City aims to reduce the number of fish passage blockages to 15 by 2014 and to have zero blockages by 2027.

A wide variety of other stream improvements are constantly underway. Development activities can deposit sediments that have braided stream channels to the point where salmon migration is impaired.

Projects such as the Kelsey Creek West Tributary enhancement (2008) removed these sediments and installed a sediment pond to facilitate the removal of future sediments.

## NATURAL DRAINAGE PRACTICES TO CLEAN AND MANAGE STORMWATER

Runoff from impervious surfaces picks up and carries pollutants from human activity, such as dirt, oil, chemicals, metals, and pet waste directly to streams, lakes, wetlands, and the Puget Sound with virtually no water quality treatment. This mixture is notoriously toxic to salmon<sup>87</sup>, and in fact, polluted stormwater runoff is recognized as one of the most serious threats to Puget Sound.<sup>88</sup> As Bellevue becomes increasingly urbanized, the quality and quantity of stormwater running off hard surfaces will further stress the ecological health of our local water bodies.

Natural Drainage Practices (NDPs), often referred to as Low Impact Development, are accepted stormwater best management practices that more closely mimic natural hydrologic conditions prior to development. In Bellevue, NDPs are an emerging alternative to traditional stormwater management tools (e.g., vaults, ponds, and pipes) that allow stormwater to collect, filter, and slowly release water off-site to streams and lakes. Generally, a combination of NDPs and traditional tools is necessary to meet stormwater management requirements on new and redevelopment projects.

NDPs can include rain gardens, pervious pavement, amended soils, rain recycling, vegetated roofs, reverse-slope sidewalks, and minimal excavation foundation system. Examples of NDP projects in Bellevue include rain gardens, pervious pavement, and bioswales along the right of way at 145th PL SE & SE 22nd Street and at the Lewis Creek Park Picnic area, as well as green roofs at the Mercer Slough Education Center and Larsen Lake Ranger Station.



Rain gardens on 145th Pl SE

**10.** *Establish a cross-departmental effort to develop an Aquatic Habitat Plan and establish clear objectives and roles for stream health.*

Streams differ in their characteristics and requirements to provide a healthy, functioning ecosystem. A citywide Aquatic Habitat Plan, developed and supported by several departments, will help address the specific needs of individual streams and clearly define City department roles in stream health and recovery projects.

**11.** *Maintain and increase pervious surfaces and natural stormwater retention features throughout the City.*

The City will lead by example and install low-impact development (LID) features on City facilities, and encourage similar practices in the community. For example, Mercer Slough Environmental Education Center has a green roof, and the Transportation department has installed pervious sidewalks. Beyond municipal sites, incentives and technical support are necessary for private developers to increasingly use LID features. The City will ensure that codes allow and encourage LID features.

**12.** *Continue to ensure City and contracted staff use integrated pest management (IPM) techniques, leading to reduced use of pesticides, and promote the benefits to the community.*

The Parks department, including its landscape contractors, will continue to manage landscapes using an Environmental Best Management Practices manual, which outlines IPM, healthy soils, and water conservation strategies. Third-party recognition and certification processes can demonstrate to the community that the City is implementing best practices around chemical use and striving for continual improvement. The USGBC's LEED green building standards also contains specific criteria to certify landscapes and site locations, which can be used as a guide in City projects. The LEED standards consider how owners manage open space and habitat, IPM, and stormwater.

**13.** *Preserve land for open spaces, forests, parks, and agriculture.*

Bellevue will continue to strategically acquire land that preserves land for future generations and builds on its remarkable park system. An example of a regional initiative that supports this strategy is the Cascade Agenda to preserve farms, forests, parks, shorelines, and natural areas. Currently 19 northwest cities (Bellevue is not one) are formally listed as "Cascade Agenda" cities.<sup>89</sup> An additional tool to further reduce regional sprawl is Transfer of Development Rights, which allows for more urban density while preserving working agricultural land or forested areas in rural King County.

**14.** *Support local agriculture through partnerships and community events.*

The City will help offer community gardening and farm stand opportunities for residents, and partner with private and non-profit organizations to encourage local Farmer's Markets and Community Supported Agriculture.

**15.** *Identify and reduce sources of particulate matter affecting Bellevue's air quality.*

This action forms a City partnership with the Puget Sound Clean Air Agency and others to address particulate matter, classified as "the most important air pollutant challenge affecting our region" because particulate matter (especially PM2.5)<sup>90</sup> causes an array of serious health effects. In the winter, most particle pollution comes from burning in fireplaces and wood stoves. During the summer, vehicle exhaust (cars, trucks, buses, among others), land-clearing burning and backyard burning of yard waste are the predominant sources of fine particles.

**16.** *Reduce idling through infrastructure improvements, education, and policy.*

The City can help reduce idling through a variety of approaches, including traffic light synchronization, roundabouts, education and signage, and instituting an no-idling policy for applicable City vehicles. Idling is a wasteful consumption of fuel (as it is essentially "zero miles per gallon") and generates exhaust that can cause smog and other respiratory problems.

# ENDNOTES

1. Carbon Disclosure Project. (2012). *Measurement for Management: CDP Cities 2012 Global Report*. Retrieved from <https://www.cdproject.net/CDPResults/CDP-Cities-2012-Global-Report.pdf>
2. Ibid.
3. Washington State Department of Ecology. (2011). *Climate Change: National and Regional Leadership*. Retrieved from Washington State Department of Ecology Web site: <http://www.ecy.wa.gov/climatechange/leadership.htm>
4. Washington State Department of Ecology. (2011). *Climate Change: Policy Framework*. Retrieved from Washington State Department of Ecology Web site: <http://www.ecy.wa.gov/climatechange/laws.htm>
5. King County. (2012). *King County - Cities Climate Collaboration and Pledge*. Retrieved from King County Web site: <http://www.kingcounty.gov/environment/climate/other-governments/climate-pledge.aspx>
6. Lydersen, K. (2009, February 15). Scientists: Pace of Climate Change Exceeds Estimates. *The Washington Post*. Retrieved from <http://www.washingtonpost.com/wp-dyn/content/article/2009/02/14/AR2009021401757.html>
7. National Research Council. (2010). *Adapting to the Impacts of Climate Change*. Retrieved from [http://dels.nas.edu/resources/static-assets/materials-based-on-reports/reports-in-brief/Adapting\\_Report\\_Brief\\_final.pdf](http://dels.nas.edu/resources/static-assets/materials-based-on-reports/reports-in-brief/Adapting_Report_Brief_final.pdf)
8. Climate Impacts Group. (2009). *The Washington Climate Change Impacts Assessment*. University of Washington. Retrieved from <http://cses.washington.edu/db/pdf/wacciareport681.pdf>
9. Crabtree, S. (2010, August 13). *Wellbeing Lower Among Workers with Long Commutes*. Retrieved from Gallup Wellbeing: <http://www.gallup.com/poll/142142/wellbeing-lower-among-workers-long-commutes.aspx>
10. Federal Highway Administration. (2012). *Traffic Volume Trends*. Retrieved from Office of Highway Police Information: Travel Monitoring Web site: [http://www.fhwa.dot.gov/policyinformation/travel\\_monitoring/tvt.cfm](http://www.fhwa.dot.gov/policyinformation/travel_monitoring/tvt.cfm)
11. Williams-Derry, C. (2011, August 8). "Disappearing Cars, Circa 2002." *Sightline Daily*. Retrieved from <http://daily.sightline.org/2011/08/08/disappearing-cars-circa-2002/>
12. Chozick, A. (2012, March 22). "As Young Lose Interest in Cars, GM Turns to MTV for Help." *New York Times*.
13. Leinberger, C. (2012, May 25). "Now Coveted - A Walkable, Convenient Place." *New York Times*.
14. League of American Bicyclists. (n.d.). *2010 Bike Commuting Data Released*. Retrieved from <http://www.bikeleague.org/news/acs2010.php>
15. ORC Interational. (2012). *Bellevue Performance Measures Survey*. City of Bellevue.
16. Texas Transportation Institute. (2011). *Table 2. What Congestion Means to Your Town, 2010*. 2011 Urban Mobility Report. Retrieved from [http://mobility.tamu.edu/files/2011/09/national-table\\_2.pdf](http://mobility.tamu.edu/files/2011/09/national-table_2.pdf)
17. See RCW 43.19.648 for more information. Compressed natural gas, liquefied natural gas, or propane may be substituted for electricity or biofuel if the department of commerce determines that electricity and biofuel are not reasonably available, and transit agencies using compressed natural gas are exempt from this requirement.
18. City of Bellevue Planning and Community Development. (January 2012). *Bellevue By the Numbers*. Retrieved March 1, 2013 from [http://www.ci.bellevue.wa.us/pdf/PCD/Bellevue\\_By\\_The\\_Numbers.pdf](http://www.ci.bellevue.wa.us/pdf/PCD/Bellevue_By_The_Numbers.pdf)
19. City of Bellevue. (2004 Update). *City of Bellevue Comprehensive Plan*. Retrieved from [http://www.bellevuewa.gov/comprehensive\\_plan.htm](http://www.bellevuewa.gov/comprehensive_plan.htm)
20. Walk Score. Retrieved March 1, 2013 from <http://www.walkscore.com/methodology.shtml> Walk Score uses a patent-pending system to measure the walkability of an address. The Walk Score algorithm awards points based on the distance to amenities in each category. Amenities within .25 miles receive maximum points and no points are awarded for amenities further than one mile. Walk Score uses a variety of data sources including Google, Education.com, Open Street Map, and Localeze. Walk Score is an approximation of walkability. There are a number of factors that contribute to walkability that are not part of the algorithm, including street design, safety from crime and crashes, pedestrian-friendly community design, topography, and weather.
21. Biodiesel emits carbon to the atmosphere but since it is not "new carbon" from buried fossil fuels, it does not increase net GHG emissions. For more information, visit the US Dept of Energy at [http://www.afdc.energy.gov/vehicles/diesels\\_emissions.html](http://www.afdc.energy.gov/vehicles/diesels_emissions.html)
22. City of Bellevue. (February 2008) *Downtown Bellevue Growth and Transportation Efficiency Center*. Retrieved from [http://www.ci.bellevue.wa.us/pdf/Transportation/connect\\_downtown\\_plan.pdf](http://www.ci.bellevue.wa.us/pdf/Transportation/connect_downtown_plan.pdf) and email correspondence with Kate Johnson.
23. California Department of Transportation. (2010, April 13). *Transit-Oriented Development (TOD)*. Retrieved from California Department of Transportation Web site: <http://www.dot.ca.gov/hq/MassTrans/tod.html>
24. Pucher, J., & Dijkstra, L. (2003, September). "Promoting Safe Walking and Cycling to Improve Public Health: Lessons From The Netherlands and Germany." *American Journal of Public Health*, 93(9), 1509-1516. Retrieved from <http://policy.rutgers.edu/faculty/pucher/ajphfromjacobsen.pdf>

25. City of Bellevue. (2009). *2009 City of Bellevue Pedestrian and Bicycle Transportation Plan Report*. Retrieved from [http://www.bellevuewa.gov/pdf/Transportation/ped\\_bike\\_plan\\_2009.pdf](http://www.bellevuewa.gov/pdf/Transportation/ped_bike_plan_2009.pdf)
26. Puget Sound Energy. (2012). *Electric Supply*. Retrieved from <http://www.pse.com/aboutpse/EnergySupply/Pages/Electric-Supply.aspx>
27. U.S. Department of Energy. (2012). *Electricity: Overview*. Retrieved from <http://www.eia.gov/electricity/>
28. Ryan, J. (2012, July 27). "Montana Coal Fuels Puget Sound Energy." *KUOW News*. Retrieved from <http://www.kuow.org/program.php?id=27475>
29. Climate Impacts Group. (2009). *Research: Hydrology and Water Resources: Key Findings*. Retrieved from Climate Impacts Group Web site: <http://cses.washington.edu/cig/res/hwr/hwrkeyfindings.shtml>
30. Climate Impacts Group. (2009). *Hydrology and Water Resources: Current Research: Climate Change Impacts on WA State Hydrology*. Retrieved from Climate Impacts Group Web site: <http://cses.washington.edu/cig/res/hwr/wachydro.shtml>
31. Northwest Energy Coalition. (2009). *The Power of Efficiency: Pacific Northwest Energy Conservation Potential Through 2020*. Retrieved from <http://nwenergy.adhostclient.com/wp-content/uploads/Power-of-Efficiency-050109.pdf>
32. U.S. Department of Energy. (2012, March). *Buildings Energy Book*. Retrieved from U.S. Department of Energy Web site: <http://buildingsdatabook.eren.doe.gov/ChapterIntro1.aspx>
33. Deleted
34. Water Supply Forum. (2012). *Regional Water Supply Outlook*. Retrieved from Water Supply Forum Web site: <http://www.watersupplyforum.org/home/outlook/>
35. Since 48% of the total electricity costs for the city are signals and streetlights, it is an important area to address. Most traffic signals have already been converted to LEDs. However, few streetlights have been converted as of 2012.
36. ENERGY STAR is a nationwide, low-cost program that ranks the actual energy use of a building against similar building types, and only certain commercial buildings may receive a score. Commercial buildings that earn the ENERGY STAR (a score of 75 or greater out of 100 points) use an average of 35 percent less energy than typical buildings and also release 35 percent less carbon dioxide into the atmosphere. LEED is program of the U.S. Green Building Council and provides independent, third-party verification that a building is designed and built with environmental performance in mind. LEED for Existing Buildings addresses whole-building cleaning and maintenance issues (including chemical use), recycling programs, exterior maintenance programs, and systems upgrades.
37. The City of Ann Arbor, Michigan, similar in size to Bellevue, established a RLF in 1982 that has afforded the city over \$600,000 in loans, with savings of over \$150,000 per year and \$1.5M cumulative. Ann Arbor has reduced its greenhouse gas emissions by 980 tons of carbon dioxide equivalents per year thanks to this fund.
38. Institute for Market Transformation. (2011). *Introduction to Commercial Building Energy Rating and Disclosure Policies*. Retrieved from [http://www.imt.org/uploads/resources/files/6.26Rating\\_Intro.pdf](http://www.imt.org/uploads/resources/files/6.26Rating_Intro.pdf)
39. Institute for Market Transformation. (n.d.). *\$810 Million Funding Needed to Achieve 90% Compliance with Building Energy Codes*. Retrieved from [http://www.doe.gov/sites/prod/files/gcprod/documents/Energy\\_Code\\_Enforcement\\_Funding\\_Task\\_Force\\_-\\_Fact\\_Sheet.pdf](http://www.doe.gov/sites/prod/files/gcprod/documents/Energy_Code_Enforcement_Funding_Task_Force_-_Fact_Sheet.pdf)
40. Ibid.
41. Schlenger, D. (2012). *Water Utilities Begin the Shift to Advanced Metering Infrastructure*. Retrieved from PenWell Corporation Web site: <http://www.waterworld.com/articles/print/volume-24/issue-8/amra/water-utilities-begin-the-shift-to-advanced-metering-infrastructure.html>
42. To date, the AIA 2030 Challenge has been adopted by many organizations including: The National Governors Association, The National Association of Counties, the states of Minnesota, Illinois, New Mexico, Washington State, and numerous cities and counties. Seattle currently has a "2030 district" commercial area established voluntarily based on the AIA 2030 Challenge goals, and Bellevue is an excellent next pilot testing ground for a similar district. In Washington, Kitsap County, Thurston County, the Seattle 2030 District, and Starbucks have joined the Better Buildings Challenge.
43. More than 50% of all building stock in some countries of Northern Europe is connected to district energy systems. Eco-district development areas and campuses have adopted an exciting district energy vision and implementation strategy in Portland. Compass Resource Management, Ltd. (2010). *Portland Pilot Ecodistricts, Neighborhood Infrastructure: Doing More with Less*. Portland Sustainability Institute, Vancouver, BC. Retrieved from [http://www.pdxinstitute.org/images/posi\\_publications/ecodistricts\\_district\\_utilities\\_final\\_report\\_november10.pdf](http://www.pdxinstitute.org/images/posi_publications/ecodistricts_district_utilities_final_report_november10.pdf)
44. U.S. Environmental Protection Agency. (2011). *Municipal Solid Waste Generation, Recycling, and Disposal in the United States: Tables and Figures for 2010*. Office of Resource Conservation and Recovery.
45. MacKerron, C. (2012). Unfinished Business: *The Case for Extended Producer Responsibility for Post-Consumer Packaging*. Retrieved from [http://asyousow.org/publications/2012/UnfinishedBusiness\\_TheCaseforEPR\\_20120710.pdf](http://asyousow.org/publications/2012/UnfinishedBusiness_TheCaseforEPR_20120710.pdf)



46. Gunders, D. (2012). *Wasted: How America Is Losing Up to 40 Percent of Its Food from Farm to Fork to Landfill*. Natural Resources Defense Council. Retrieved from <http://www.nrdc.org/food/files/wasted-food-IP.pdf>
47. U.S. Environmental Protection Agency. (2009). *Opportunities to Reduce Greenhouse Gas Emissions through Materials and Land Management Practices*. Office of Solid Waste and Emergency Response. Retrieved from [http://www.epa.gov/oswer/docs/ghg\\_land\\_and\\_materials\\_management.pdf](http://www.epa.gov/oswer/docs/ghg_land_and_materials_management.pdf)
48. U.S. Department of Health and Human Services. (2009). *Fourth National Report on Human Exposure to Environmental Chemicals*. Centers for Disease Control and Prevention. Retrieved from <http://www.cdc.gov/exposurereport/pdf/FourthReport.pdf>
49. Washington State Department of Ecology. (2011). *Solid Waste in Washington State: 20th Annual Status Report*. Waste 2 Resources Program. Retrieved from <https://fortress.wa.gov/ecy/publications/publications/1107039.pdf>
50. U.S. Environmental Protection Agency. (2011). *Reducing Greenhouse Gas Emissions through Recycling and Composting*. Materials Management Workgroup of the West Coast Climate and Materials Forum. Retrieved from [http://www.epa.gov/region10/pdf/climate/wccmmf/Reducing\\_GHG\\_s\\_through\\_Recycling\\_and\\_Composting.pdf](http://www.epa.gov/region10/pdf/climate/wccmmf/Reducing_GHG_s_through_Recycling_and_Composting.pdf)
51. Washington State Department of Ecology. (2011). *Green Purchasing*. Retrieved from Washington Department of Ecology Web site: <http://www.ecy.wa.gov/programs/swfa/epp/>
52. Washington State Department of Ecology, (December 2011). *Solid Waste in Washington State: 20th Annual Status Report*. Waste 2 Resources Program. Retrieved from <https://fortress.wa.gov/ecy/publications/publications/1107039.pdf>
53. King County. (2012, June 12). *Indicators: Solid Waste Disposal and Recycling*. Retrieved from <http://your.kingcounty.gov/dnrp/measures/indicators/rc-solid-waste.aspx>
54. Northwest Product Stewardship Council. (2012, September 18). Retrieved from <http://www.productstewardship.net/>
55. In a product stewardship model, those who have the most influence over design decisions have a commensurate responsibility for the product at end-of-life. In addition, those who do not use or benefit from the product are not burdened with the product's disposal impacts or costs. Proper physical and fiscal responsibilities provide incentives to change the design and produce less waste.
56. Pharmaceuticals are managed for safe disposal, rather than recycling.
57. King County. (June 8, 2011). *Construction, demolition & landclearing diversion/recycling and disposal options*. Retrieved from <http://your.kingcounty.gov/solidwaste/facilities/cdl-stations.asp>
58. Washington State Department of Ecology, (December 2011).
59. E.g., re-manufactured cartridges, which Bellevue does not currently purchase.
60. American Forests. (2008). *Urban Ecosystem Analysis: City of Bellevue, WA*. Retrieved from [http://systemecology.org/4\\_Past\\_Projects/AmforReport\\_Bellevue\\_lowres.pdf](http://systemecology.org/4_Past_Projects/AmforReport_Bellevue_lowres.pdf)
61. Booth, D.; Hartley, D; and Jackson, R. (June 2002) "Forest Cover, Impervious-Surface Area, and the Mitigation of Stormwater Impacts." *Journal of the American Water Resources Association*. Retrieved from [https://www.ci.oswego.or.us/sites/default/files/archives/projects/planningprojects/PP09-0011\\_Sensitive\\_Lands\\_Outreach/Second\\_Look\\_Task\\_Force/01-07-10\\_Part\\_1\\_Scientific\\_Papers.pdf](https://www.ci.oswego.or.us/sites/default/files/archives/projects/planningprojects/PP09-0011_Sensitive_Lands_Outreach/Second_Look_Task_Force/01-07-10_Part_1_Scientific_Papers.pdf)
62. Puget Sound Partnership. Retrieved from [http://www.psp.wa.gov/SR\\_status.php](http://www.psp.wa.gov/SR_status.php)
63. National Audobon Society. (2012). *State of the Birds*. Retrieved from Audobon Society Web site: <http://web4.audubon.org/bird/stateofthebirds/cbid/>
64. Harnik, P. and Welle, B. (2009) *Measuring the Economic Value of a City Park System*. The Trust for Public Land. Retrieved from <http://www.tpl.org/publications/books-reports/ccpe-publications/measuring-the-economic-value.html>
65. Donovan, G., Michaelb, Y., Butryc, D., Sullivand, A., and Chasea, J. (January 2011). "Urban trees and the risk of poor birth outcomes." *Health & Place*. Volume 17, Issue 1, Pages 390–393. Retrieved from <http://www.sciencedirect.com/science/article/pii/S1353829210001656>
66. eCityGov Alliance. (2009). *Mercer Slough Nature Park Trails*. Retrieved from MyParksandRecreation.com: <http://www.myparksandrecreation.com/ParksTrails/Details.aspx?pid=471>
67. Puget Sound Partnership. (2010). *2009 State of the Sound Report*. Retrieved from [http://www.psp.wa.gov/downloads/SOS09/09-04534-000\\_State\\_of\\_the\\_Sound-1.pdf](http://www.psp.wa.gov/downloads/SOS09/09-04534-000_State_of_the_Sound-1.pdf)
68. Low impact development (LID) is a development strategy that mimics natural systems to help maintain and restore the natural hydrology of watersheds in urban, developed areas.
69. City of Bellevue. (2009). *City of Bellevue Comprehensive Plan: Environmental Element*. Retrieved from [http://www.bellevuewa.gov/pdf/PCD/CompPlan\\_Vol\\_1\\_09.Environment.pdf](http://www.bellevuewa.gov/pdf/PCD/CompPlan_Vol_1_09.Environment.pdf)
70. American Forests. (2008).
71. Ibid.

72. URFO, January 2010. *City of Bellevue i-Tree Ecosystem Analysis*.
  73. EarthCorps. May 2012. "Forest Condition Assessment Model Analysis of 100 permanent plots located in forested parks in Bellevue, Washington."
  74. City of Seattle, King County, Pierce County, and Snohomish County. (2010). *Puget Sound Stream Benthos*. Retrieved July 8, 2010. <http://pugetsoundstreambenthos.org/default.aspx>
  75. Researchers have found the B-IBI score to be significantly correlated with the amount of urbanization in a watershed, measured by percent impervious area (Alberti et al. 2007; Booth et al. 2004; Morley and Karr 2002). Generally, when a watershed becomes more than 10 percent impervious, the score is lower. Kelsey Creek basin is 40% impervious with 55% tree canopy in the riparian buffer, Lewis Creek basin is 20% impervious with 85% tree canopy in the riparian buffer, and Coal Creek basin is 29% impervious with 69% tree canopy in the riparian buffer (City of Bellevue Utilities Department, 2012)
- References:
- Alberti, M., D. Booth, K. Hill, B. Coburn, C. Avolio, S. Coe, and D. Spirandelli. (2007). "The Impact of Urban Patterns on Aquatic Ecosystems: An Empirical Analysis in Puget Lowland Sub-basins." *Landscape and Urban Planning* 80(4):345-361.
  - Booth, D.B., J.R. Karr, S. Schauman, C.P. Konrad, S.A. Morley, M.G. Larson, and S.J. Burges. (2004). "Reviving Urban Streams: Land Use, Hydrology, Biology, and Human Behavior." *Journal of the American Water Resources Association*. 40(5):1351-1364.
  - Morley, S.A. and J.R. Karr. (2002). "Assessing and Restoring the Health of Urban Streams in the Puget Sound Basin." *Conservation Biology* 16(6):1498-1509.
  - City of Bellevue Utilities Department. (2012). *2012 Storm and Surface Water System Plan Review Draft*. Retrieved March 16, 2013 from [http://www.ci.bellevue.wa.us/pdf/Utilities/Storm\\_Plan\\_2012.pdf](http://www.ci.bellevue.wa.us/pdf/Utilities/Storm_Plan_2012.pdf)
76. Bollman, W. (October 2009) *Biological Assessment of Stream Sites in the City of Bellevue, Based on Macroinvertebrate Assemblages. Report to the City of Bellevue, Washington Utilities Department*. Retrieved from [http://www.ci.bellevue.wa.us/pdf/Utilities/BELLEVUE\\_Bugs\\_FINAL08\\_Summary.pdf](http://www.ci.bellevue.wa.us/pdf/Utilities/BELLEVUE_Bugs_FINAL08_Summary.pdf)
  77. Anchor QEA. (2012). *2011 Bellevue Salmon Spawner Surveys*. Seattle, WA. Retrieved from [http://www.bellevuewa.gov/pdf/Utilities/Bellevue\\_Salmon\\_Spawner\\_Survey\\_4-12-2012\\_Final.pdf](http://www.bellevuewa.gov/pdf/Utilities/Bellevue_Salmon_Spawner_Survey_4-12-2012_Final.pdf)
  78. Metropolitan King County Countywide Planning Policies Benchmark. (June 2005) *Program Indicator 16: Change in Wetland Acreage and Functions*. Retrieved from [http://your.kingcounty.gov/budget/benchmark/bench04/Environment/Environment\\_05.pdf#16](http://your.kingcounty.gov/budget/benchmark/bench04/Environment/Environment_05.pdf#16)
  79. Pesticide Action Network North America. (October 2012) "A Generation in Jeopardy. How pesticides are undermining our children's health & intelligence." Retrieved April 3, 2013 from <http://www.safelawns.org/blog/wp-content/uploads/2012/10/KidsHealthReportOct2012.pdf>
  80. Parker, C. (2010). *Bellevue Parks and Open Space System Plan 2010*. City of Bellevue, Parks and Community Services. Retrieved from [http://www.bellevuewa.gov/pdf/Parks/park\\_plan\\_update\\_draft\\_4-29-10.pdf](http://www.bellevuewa.gov/pdf/Parks/park_plan_update_draft_4-29-10.pdf)
  81. Puget Sound Clean Air Agency. (2012). *2010 Air Quality Data Summary*. Retrieved from [http://www.pscleanair.org/news/library/reports/2010\\_AQDS\\_Report.pdf](http://www.pscleanair.org/news/library/reports/2010_AQDS_Report.pdf)
  82. Either an easement recorded on the property title, or a separate tract or tax parcel
  83. Urban residential (-5%), Suburban residential (-15%), Central Business District (-8%), Commercial/Mixed Use (-4%), and Industrial (-6%). From: American Forests. (2008). *Urban Ecosystem Analysis: City of Bellevue, WA*. Retrieved from [http://systemecology.org/4\\_Past\\_Projects/AmforReport\\_Bellevue\\_lowres.pdf](http://systemecology.org/4_Past_Projects/AmforReport_Bellevue_lowres.pdf)
  84. American Forests. (2008).
  85. City of Bellevue. (n.d.). *EW-4: Mountains to Sound Greenway*. Retrieved from City of Bellevue Web site: [http://www.bellevuewa.gov/pdf/Transportation/Mountains\\_to\\_Sound\\_Greenway\\_Trail\\_Handout.pdf](http://www.bellevuewa.gov/pdf/Transportation/Mountains_to_Sound_Greenway_Trail_Handout.pdf)
  86. US EPA (2008) Washington Causes of Impairment for Reporting Year 2008. Available from [http://ofmpub.epa.gov/tmdl\\_waters10/attains\\_state.control?p\\_state=WA#total\\_assessed\\_waters](http://ofmpub.epa.gov/tmdl_waters10/attains_state.control?p_state=WA#total_assessed_waters)
  87. Associated Press. (January 22, 2013). "Study links coho salmon deaths to stormwater runoff from Washington highways." Oregon Live. Retrieved from [http://www.oregonlive.com/environment/index.ssf/2013/01/study\\_links\\_coho\\_salmon\\_deaths.html](http://www.oregonlive.com/environment/index.ssf/2013/01/study_links_coho_salmon_deaths.html)
  88. Puget Sound Partnership. Retrieved from [http://www.psparchives.com/our\\_work/stormwater.htm](http://www.psparchives.com/our_work/stormwater.htm)
  89. See Forterra at [http://www.forterra.org/who\\_we\\_are/cascade\\_agenda](http://www.forterra.org/who_we_are/cascade_agenda)
  90. PM2.5 are fine particles measuring 2.5 micrometers in diameter or smaller that embed in the lungs.



# APPENDICES

**A-1** Appendix A: Project Portfolio

# SUSTAINABILITY PROJECTS PORTFOLIO



CITY OF BELLEVUE





OCTOBER 2012 ENVIRONMENTAL STEWARDSHIP INITIATIVE






All MTCO<sub>2e</sub> calculations have been updated to reflect eGrid 2009 data found at:  
[http://epa.gov/cleanenergy/documents/egridzips/eGRID2012V1\\_0\\_year09\\_SummaryTables.pdf](http://epa.gov/cleanenergy/documents/egridzips/eGRID2012V1_0_year09_SummaryTables.pdf)  
Non-baseload emission factors were used to calculate savings unless noted otherwise.

# TABLE OF CONTENTS




## Strategic Initiatives & Data Management

	Page	
	A-3	American Recovery & Reinvestment Act
	A-4	Enterprise Environmental Data Management Software

## Community & Business Engagement

	A-5	Eastside Sustainable Business Alliance (ESBA)
	A-6	Eastside Green Business Challenge
	A-6	GreenWA.org Sustainability Engagement Website
	A-7	Schools Outreach
	A-8	Carbon Yeti






## Mobility & Land Use

	A-9	Hybrid and Electric Vehicle Fleet
	A-10	Transportation Demand Management Programs
	A-11	Electric Vehicle Infrastructure




## Energy & Water

	A-13	Recreation Facility Lighting Upgrades
	A-14	City Hall Lighting Upgrades
	A-15	ENERGY STAR rating for Bellevue City Hall
	A-16	Traffic Signal Upgrades
	A-16	Resource Conservation Manager Program
	A-17	Information Technology Energy Efficiency
	A-18	Green Building
	A-19	Home Energy Reports
	A-20	Water Conservation Program
	A-21	SunShot Initiative for Solar Energy

## Materials Management & Waste

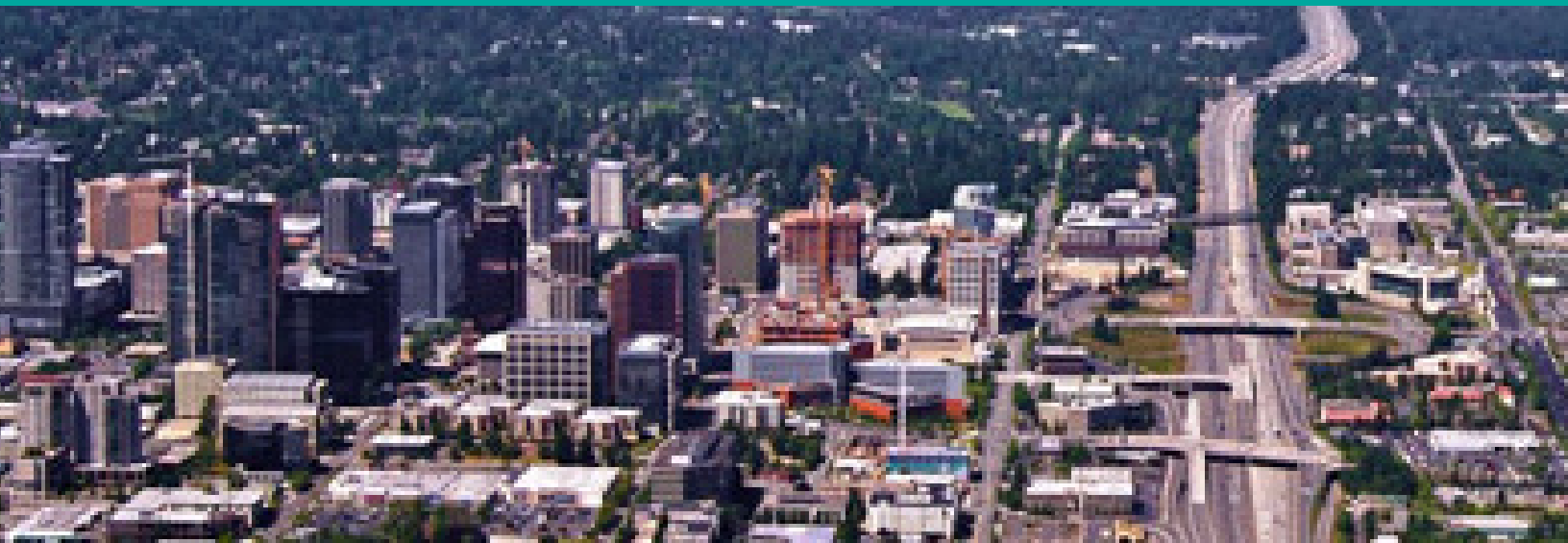
	A-22	Paper Use Reduction
	A-23	In-House Recycling Program
	A-23	Residential Household Hazardous Waste Program
	A-24	Residential Recycling Program
	A-25	Business Waste Reduction and Recycling Education and Technical Assistance

## Ecosystems & Open Spaces

	A-26	Pollution Prevention Education and Technical Assistance
	A-27	Stream Team Stormwater Program
	A-28	Natural Yard Care Program

-  Community Project
-  Municipal Project
-  Both Community & Municipal Project

# Strategic Initiatives & Data Management



## M AMERICAN RECOVERY & REINVESTMENT ACT



In October 2009, the City of Bellevue received \$1.2 million in grant funding from the American Recovery and Reinvestment Act (ARRA), specifically under the Energy Efficiency and Conservation Block Grants (EECBG) program. The purpose of this funding is to “seed the new economy into perpetuity” by funding investments in clean technology, energy efficiency, conservation, education, and training.

ARRA funding has succeeded greatly in providing a necessary boost to sustainability activities for the City. ARRA has enabled the execution of cost and energy-saving projects, commercial and residential engagement, and enhanced measurement and reporting systems that broaden awareness of key environmental performance indicators. Eight specific projects listed below have been or are being administered with ARRA funding. More information on each project is available throughout the document.

Projects include:

1. Green Vehicles: Upgrade of 90 fleet vehicles from gas-only to hybrid and electric technology.
2. Recreation Facility Lighting: Indoor and outdoor lighting upgrades at four major recreation facilities.
3. City Hall Lighting: Lighting upgrades at Bellevue City Hall parking garages and stairwells.
4. Home Energy Reports: Provided reports advising residents of their energy usage patterns as compared with similar neighbors—and opportunities for savings.
5. Sustainability Web Portal: Websites for engaging businesses and residents in sustainability actions ([esba.sustainableeastside.org](http://esba.sustainableeastside.org); [GreenWA.org](http://GreenWA.org)).

6. Enterprise Environmental Data Management Software: Software tool that tracks key environmental performance indicators city-wide and supports trend analysis.
7. Electric Vehicle Charging: Installation of electric vehicle charging stations for City fleet and employee usage.
8. Greenhouse Gas Inventory: An updated inventory of City and community greenhouse gas emissions, coupled with an update to the City’s ESI Strategic Plan for 2013-2018.

## M ENTERPRISE ENVIRONMENTAL DATA MANAGEMENT SOFTWARE



The Enterprise Environmental Data Management software will allow the City to consolidate, track, and manage environmental performance data (e.g., energy, fuel, waste, water, employee commuting, and materials). The software will centrally combine data; measure and report progress; forecast benefits of programs and campaigns; and engage stakeholders with accurate, up-to-date, and transparent information related to the City’s environmental performance targets. Key metrics such as greenhouse gas emissions and resource savings will be tracked more closely and consistently, resulting in the ability to strategically manage and reduce operating costs and negative environmental impacts.

<i>Start date and end date</i> .....	March 2012 – September 2015
<i>Upfront Cost</i> .....	\$40,000
<i>Funding Source</i> .....	ARRA
<i>Annual Energy Savings</i> .....	Expected to drive savings across all operations



# Community & Business Engagement



## © EASTSIDE SUSTAINABLE BUSINESS ALLIANCE



Public and private partners in the Eastside Sustainable Business Alliance (ESBA) work to accelerate the adoption of cleaner technologies and operational improvements in organizations throughout the Eastside. By participating in programs and events, businesses can overcome the green learning curve more quickly—improving environmental, economic, and social bottom lines—with the advice and support of a knowledgeable business community. The ESBA website at [esba.sustainableeastside.org](http://esba.sustainableeastside.org) is home to feature stories, case studies, presentation archives, and emerging programs.

ESBA was launched in 2010 and has grown to engage over 100 eastside businesses of all types and sizes. Other benefits of participation include:

- no cost
- technical tools
- idea-sharing
- marketing opportunities
- community building
- events
- roundtables
- expert advice
- best practices

## © EASTSIDE GREEN BUSINESS CHALLENGE



The Eastside Green Business Challenge is a friendly competition among local organizations and 6 eastside cities (Bellevue, Issaquah, Kirkland, Renton, Sammamish, and Mercer Island) to see who can save the most money and natural resources in one year.

The Challenge successfully launched in January 2012 and gives businesses a year to make as many improvements to their sustainability performance as possible. With a convenient online scorecard, participating entities have insider access to free resources that help them prioritize and tackle the issues that matter most. The Challenge is supported with generous funding from ICLEI–Local Governments for Sustainability and corporate sponsors including Cascade Power Group, Office Depot, Puget Sound Energy, Republic Services, Cedar Grove Composting, and more. The Challenge aims to save the combined business community over \$2 million and 10,000 MTCO<sub>2e</sub>.

<i>Start date and end date</i> .....	January 2012 through December 2012 (program may be continued)
<i>Grant</i> .....	\$25,000 grant, plus in-kind and numerous corporate sponsorships
<i>Funding Source</i> .....	ICLEI–Local Governments for Sustainability and private sector sponsorships
<i>Annual Financial Savings Goal</i> .....	\$2 million
<i>Annual CO<sub>2</sub> Reduction Goal</i> .....	10,000 MTCO <sub>2e</sub>

## © GREENWA.ORG SUSTAINABILITY ENGAGEMENT WEBSITE



Bellevue’s GreenWA.org website is a community engagement platform that helps residents, businesses, and tourists tour and learn about the sustainability assets in Bellevue. Users are treated to a database of fun and educational maps, videos, and knowledge pieces that highlight where, how, and why to live more sustainably in Bellevue.

The “Maps” portion of the site allows users to identify a wide variety of sustainability assets—where they can commute via bicycle, spot salmon in the streams, or recycle an old television, for example. Did you spot a rain garden that you want to know more about? Just click into the map marker for more information on how this asset is helping Bellevue meet its environmental stewardship goals and how to build your own.

By viewing videos, reading articles, or signing up for volunteer opportunities on the events calendar, residents will be able to learn and engage with each other toward common goals – healthy living, clean air, and clean water. The website also allows the City to continue to survey where and how it is pushing the envelope on sustainability innovations and where it has more work to do.

The site is being built with the intention of expansion to regional jurisdictions and with hopes of becoming a national showpiece for community engagement on critical sustainability issues.

<i>Project start and end date .....</i>	2012 – ongoing
<i>Total cost .....</i>	\$124,000
<i>Funding Source .....</i>	ARRA

## © SCHOOLS OUTREACH



The City provides help to Bellevue schools in setting up or improving waste reduction, water conservation, composting and recycling—actions that can save resources as well as money on solid waste bills. Outreach assistance is also available on other environmental topics such as drinking water, conservation, pollution prevention, salmon migration and reducing your carbon footprint.

<i>Start date and end date .....</i>	Ongoing
<i>Outcomes .....</i>	Youth education programs reached about 4,500 students

## © CARBON YETI



Residents can cut greenhouse gas emissions and conserve energy at home without huge lifestyle changes. The City of Bellevue offers tips with the help of a mascot for environmental stewardship, the Carbon Yeti.

In the “Smaller Footprint Pledge” book, the cartoon Bigfoot shows ways to save energy in and around one’s home. The Carbon Yeti has an interactive house online at [www.BellevueWA.gov/yetihouse](http://www.BellevueWA.gov/yetihouse) with related games too.

The Carbon Yeti earned the City a Clean Air Excellence Award from the Environmental Protection Agency in 2011, the Youth Education Recycler of 2010 from the Washington State Recycling Association, and the Green City Award in 2012 from Waste & Recycling News.

<i>Start date and end date</i> .....	April 2007 through present
<i>Total cost</i> .....	\$122,339 as of April 2012
<i>Funding Source</i> .....	Washington State Department of Ecology Coordinated Prevention Grant, solid waste fund, storm water funding
<i>Annual pledges</i> .....	850 pledges between 12/17/07 and 7/12/10
<i>Annual MTCO<sub>2e</sub> Savings</i> .....	1,604 MTCO <sub>2e</sub> per year estimated assuming 100 percent of people pledging changed their behavior (equivalent to a 13.5 percent annual reduction per person from WA per capita CO <sub>2</sub> emissions)
<i>Cost per MTCO<sub>2e</sub> reduced**</i>	\$47 per (\$75,338 for the 2.6 year pledge period above)

\*calculated from Carbon Yeti analysis spreadsheet, provided by City of Bellevue Utilities Department

# Transportation & Mobility



## M HYBRID AND ELECTRIC VEHICLE FLEET



With the help of grant funding from EECBG and Western Washington Clean Cities Coalition, Bellevue is transitioning 90 gas fleet vehicles to hybrid and 3 electric vehicles. Expected annual savings from the replacement of these vehicles is nearly \$90,000 in fuel costs, 267 metric tons of carbon dioxide emissions, and 30,000 gallons of gasoline.

The City purchased three fully electric vehicles in 2012. This purchase not only saves on gas and emissions, but serves as an educational showpiece for our innovative community.

<i>Project start and end date</i> .....	2010 to present
<i>Upfront Cost</i> .....	\$9,200 approximate additional cost per hybrid vehicle
<i>Total grant</i> .....	\$516,000
<i>Funding Source</i> .....	ARRA and Puget Sound Clean Air Agency
<i>Annual Fuel Savings</i> .....	30,000 gallons
<i>Annual Financial Savings</i> .....	\$90,000
<i>Annual MTCO<sub>2e</sub> Reduction</i> .....	267 MTCO <sub>2e</sub>

## C TRANSPORTATION DEMAND MANAGEMENT PROGRAMS



Bellevue has a comprehensive approach to reducing vehicle trips in the community through commute trip reduction (CTR) programs at worksites and outreach to employees and residents. Large employers, with 100 or more employees commuting to a worksite in the 6am-9am peak period, are required per state laws and City ordinance to establish programs (BCC 14.40). These employers receive assistance from the City through a contract with King County Metro to develop effective programs and measure progress.

The base of workers at sites affected by the CTR program has expanded. In 2007/2008, there were 21,316 workers at 52 sites (~15 percent of total workers in the City). During the 2011/2012 survey period, there were 32,449 workers at 60 affected worksites (~24 percent of total workers in the City). The rate of drive-alone commuting at these sites increased slightly, from 63.2 percent to 63.9 percent. The average (one-way) vehicle miles traveled declined from 11.4 to 10.9.

Downtown Bellevue trip reduction programs are guided by the City’s Connect Downtown plan. Small employers in Downtown who are not mandated to provide CTR programs for their employees can receive support through the voluntary Commute Advantage program. Since launching the program in late 2007, 164 employers have substantively engaged with the program by attending workshops or private consultation, and 72 have started commute programs for their employees or significantly enhanced their existing commute program. Overall, one-third of workers in Downtown receive transit passes that are heavily or fully subsidized by their employers. The most recent mode share measurement (2011) shows 17 percent of commute trips to Downtown occurring via transit and an additional 11 percent by carpool and vanpool.

The City also started an online commute club, “Downtown Bellevue on the Move”, in 2011 for downtown workers and residents, in which they can log their non-drive-alone trips and earn rewards; an estimated 120 individuals shifted to a non-drive-alone mode as a result of the program. The proportion of downtown commuters who drive alone to work is at 65 percent in 2011, down from 71 percent in the 2005 measurement.

Citizen surveys consistently show strong support among Bellevue residents for encouraging and facilitating increased use of transportation alternatives, such as riding the bus, carpooling, and vanpooling. The City maintains the ChooseYourWayBellevue.org website as a one-stop resource for employers, employees, and residents to learn about transportation options and available resources.

<i>Program start and end date</i> .....	2007 to present (CTR program for large employers started in 1993)
<i>Annual CTR program cost, 2012 (Actual)</i> .....	State CTR grant and City staff time and overhead (\$112,226)
<i>Other TDM program costs, 2012 (Actual)</i> .....	City funds (\$245,268) + Federal CMAQ funds through King County (\$77,779) + State I-405 construction mitigation funds through King County (\$128,990) = \$452,037
<i>Cost per MTCO<sub>2e</sub> reduced, CTR program only</i> .....	\$5.87

Trip reduction impact (CTR program sites only):

- Scope of program expanded from 21,316 employees (2007/2008) to 32,449 employees (2011/2012).
- Drive-alone commute rate increased slightly from 63.2 percent (2007/2008) to 63.9 percent (2011/2012).
- Average one-way VMT declined from 11.4 to 10.9 miles.
- Total annual GHG savings associated with VMT reductions (adjusting for number of employees) were 19,123 MTCO<sub>2</sub>e in 2011/2012.

	Units	2007/2008	2009/2010	2011/2012
Daily VMT per employee (one-way)	VMT	11.4	10.6	10.9
Daily GHG per employee	Lbs CO <sub>2</sub> e	22.75	21.06	21.83
Total annual GHG emissions-All employees	MTCO <sub>2</sub> e	65,886	66,408	79,176

Note: Emissions above do not include emissions from transit commuters.

## © ELECTRIC VEHICLE INFRASTRUCTURE



Electric vehicle technology is a promising new opportunity to reduce emissions from Bellevue’s largest single emissions sector – transportation. The City is working hard to ensure that our community and region are “plug-in ready” as mass-produced electric vehicles increase their presence in the market. Working in collaboration with all levels of government, as well as businesses, nonprofits and community members, Bellevue is supporting the installation of charging stations throughout the region, which are enabling the use of this cleaner technology, including:

- Streamlining the permitting process and reducing costs to homeowners and businesses for installing charging stations;
- Identifying code changes necessary for the installation of new charging stations;
- Installing publicly available charging stations at City Hall and major Parks facilities (16 to date);
- Providing education about electric vehicles, charging stations and the benefits of this technology;

- Coordinating a regional EV infrastructure strategy with neighboring cities, King County, and the state;
- Procuring electric vehicles for use in City fleets (3 to date); and
- Stay tuned to all developments in this emerging industry.

Bellevue has received direct funding for electric vehicle infrastructure from both the Western Washington Clean Cities Coalition and EECBG. With this funding, the City has installed 16 public use charging stations at 6 different municipal locations. Major contributions to a robust charging network across northwestern states are being made by several other entities, including private businesses, ChargePoint America, and the EV Project.

<i>Program start and end date</i> .....	November 2010 to October 2012
<i>Cost</i> .....	\$260,000 grant
<i>Funding Source</i> .....	ARRA, Western Washington Clean Cities Coalition, and Coulomb Technologies
<i>Cumulative MTCO<sub>2e</sub> Reduction</i> .....	6.97 MTCO <sub>2e</sub> since March 2011 through October 2012



# Energy & Water



## M RECREATION FACILITY LIGHTING UPGRADES



Extensive lighting upgrades took place at Robinswood Tennis Center, South Bellevue Community Center, Newport Hills sports fields, and Highland Center sports fields. New lighting systems provide higher quality light with fewer bulbs and less spillage, saving money and energy while substantially improving sports field and recreational facilities.

<i>Project start date</i>	
<i>Robinswood Tennis Center</i> .....	installed 8.25.10
<i>SBCC</i> .....	installed 8.25.10
<i>Newport Hills</i> .....	installed 7.28.10
<i>Highland Center</i> .....	installed 9.1.10
<i>Upfront Cost</i> .....	\$350,000
<i>Funding Source</i> .....	
<i>ARRA and Puget Sound Energy</i>	
<i>Annual Fuel Savings</i> .....	335,000 kWh
<i>Annual Financial Savings</i> .....	\$37,000
<i>Annual MTCO<sub>2e</sub> Reduction</i> .....	232 MTCO <sub>2e</sub>
<i>Payback Period</i> .....	9.4 years
<i>Cost per MTCO<sub>2e</sub> reduced</i> .....	\$151 (assuming 10 year lifespan)

## M CITY HALL LIGHTING UPGRADES



In 2011, the City replaced less efficient lamps in the parking garage and stairwells of Bellevue City Hall (many which burn 24 hours a day) using EECBG grant funds.

In employee parking garage P-1 through P-4, 147 new hi-lo fixtures and lamps replaced a mixture of 147 100W HPS and 2L 4' 32W fixtures. The hi-lo fixture operates with one F-17 lamp constantly on, and two 32W lamps starting when the occupancy sensor detects motion.

In stairwells 1-7, 87 new 2L F-17 hi-lo fixtures and lamps replaced 81 2L 4' 32W T-8 wall-mounted fixtures, and three 4L 8' 32W T-8 wall-mounted fixtures. Six 3L 4' 32W T-8 ceiling-mounted fixtures were replaced with six (6) 2L 4' 32W T-8 ceiling mounted fixtures. These fixtures have two F-17 lamps, with one constantly on and the other starting when it detects sound/motion.

<i>Project start and end date</i> .....	September 2011 – November 2011
<i>Total Cost (w/o incentives)</i> .....	\$122,854
<i>Funding Source</i> .....	ARRA, \$23,740 grant from PSE, and Bellevue Facilities Fund
<i>Annual Energy Savings</i> .....	118,883 kWh
<i>Annual Financial Savings</i> .....	\$8,591
<i>Annual CO2 Reduction</i> .....	76 MTCO2e
<i>Payback Period</i> .....	14 years without utility incentives; 11.5 years with utility incentives
<i>Cost per MTCO2e reduced</i> .....	\$162 per (assuming 10 year lifespan)

## M ENERGY STAR RATING FOR BELLEVUE CITY HALL



Bellevue City Hall has twice earned the U.S. Environmental Protection Agency’s (EPA’s) prestigious ENERGY STAR in 2008 and 2010. ENERGY STAR is the national symbol for protecting the environment through superior energy efficiency. EPA’s ENERGY STAR energy performance scale helps organizations assess how efficiently their buildings use energy relative to similar buildings nationwide. A building that scores a 75 or higher on EPA’s 1-100 scale may be eligible for the ENERGY STAR.

Not only has City Hall earned the award twice, it is outperforming most buildings nationwide. A score of 96 means City Hall is in the top four percent of similar buildings nationwide. Twenty-five buildings are currently certified as ENERGY STAR in Bellevue. Only three city halls in Washington State are certified, and fourteen across the nation.

CITY HALL RATING	
2007	83
2008*	87
2009	89
2010*	91
2011	96
2012	97
*Certified	

As of June 2012, Bellevue City Hall has reduced its total energy use 25.7 percent since the year ending December 2008!

<i>Certification dates</i> .....	2008, 2010
<i>Total Cost</i> .....	\$5,000 for initial certification, \$1,000 in subsequent years
<i>Total Financial Savings</i> .....	\$186,175 compared to the year of 2008 (approx. \$53,000 per year) through June 2012, adjusting for outside air temperature and rate changes
<i>MTCO<sub>2e</sub> Reduction*</i> .....	862 MTCO <sub>2e</sub> compared to the year of 2008, as of June 2012
*Calculated using Portfolio Manager	

## M TRAFFIC SIGNAL UPGRADES



Bellevue's Transportation Department has replaced all incandescent light bulbs in traffic signals with new light-emitting diodes (LEDs), starting the upgrade in 2001.

The savings to the City in costs, energy, and carbon dioxide emissions are some of the most impressive of any municipal energy efficiency projects to date.

Savings are expected to accumulate over time.

<i>Project start and end date</i> .....	2001 - 2012
<i>Total cost</i> .....	\$493,000 from 2009 to 2012
<i>Annual Financial Savings</i> .....	\$196,000 (2012)
<i>Annual MTCO<sub>2e</sub> Reduction*</i> .....	989 MTCO <sub>2e</sub> in 2012, a 95 percent reduction compared to 2000
<i>Simple Payback</i> .....	2.6 years
<i>Cost per MTCO<sub>2e</sub> reduced</i> .....	\$71 (assuming a 7-year lifespan)

*\*uses base load eGrid emission factors*

## M RESOURCE CONSERVATION MANAGER PROGRAM



The Resource Conservation Manager (RCM) program, started in 2009, focuses on reducing energy use throughout the City's facilities, as well as water conservation and waste prevention.

As of April 2012, the RCM program reduced greenhouse gas emissions by 1,595 metric tons of carbon dioxide (MTCO<sub>2e</sub>) compared to the baseline year ending March 2009.

Some of the energy conservation projects that the City has implemented thus far include:

- Upgrading lighting efficiency and control;
- Scheduling mechanical equipment to better match occupancy;
- Adjusting hot water temperatures to 120F;
- Installing variable frequency drives on pumps and motors;
- Reducing unnecessary plug loads;
- Installing low-flow water fixtures such as showerheads and aerators;
- Educating and engaging employees about energy efficiency;
- Hiring Energy Services Performance Contractors (ESCO) to identify further projects, assist with financing, and install the projects; and
- Reporting on performance.

<i>Program start and end date</i> .....	April 2009 – April 2012
<i>Total Cost</i> .....	\$88,389 per year
<i>Funding Source</i> .....	Puget Sound Energy grant of \$28,000 per year; city energy bill savings
<i>Cumulative Energy Saving goal</i> .....	3,614,320 kWh; 80,407 therms
<i>Financial savings goal</i> .....	\$180,500 per year, \$345,920 cumulatively
<i>MTCO<sub>2</sub>e Reduction goal</i> .....	1,427 MTCO <sub>2</sub> e per year; 2,740 MTCO <sub>2</sub> e cumulatively
<i>Actual Energy Savings</i> .....	3,345,670 kWh; 140,724 therms
<i>Actual Cost Savings</i> .....	\$217,319 annually, \$391,971 cumulatively
<i>Actual MTCO<sub>2</sub>e Reduction</i> .....	1,595 MTCO <sub>2</sub> e annually, 2,888 MTCO <sub>2</sub> e cumulatively
<i>Cost per MTCO<sub>2</sub>e reduced</i> .....	\$60 (includes offset of PSE grant)

## M INFORMATION TECHNOLOGY ENERGY EFFICIENCY



In winter of 2007, the City installed the Nightwatchman software that powers down City monitors and CPUs at midnight. The Resource Conservation Manager program and the IT Change Advisory Board changed this setting to 10 p.m. (previously it was midnight) in the summer of 2010 and implemented Nightwatchman for laptops. IT also assisted in implemented sleep mode for monitors after ten minutes of inactivity in late 2010.

All City computers are rated as ENERGY STAR. Computers bought in the future (as of 2010) by the City will be Electronic Product Environmental Assessment Tool (EPEAT) Gold-rated (HP standard) and Restriction of the use of certain Hazardous Substances (RoHS) compliant—which are high environmental standards for toxicity, materials, and energy use in electronics. Multi-Function Devices (MFPs) leased by the City are also ENERGY STAR-rated.

In addition, IT has a goal of virtualizing its servers from the current 30 to 40 percent virtualization (approximately 60 servers) to 70 to 85 percent virtualization (approximately 100 more servers). Currently 60 percent of servers are virtualized (as of March 2012). Virtualizing servers means reducing the amount of hardware (and infrastructure) needed to support the same file storage. This reduces energy consumption in Data Centers by up to 30 percent for each server replaced.

<i>Start date and end date</i> .....	2007
<i>Annual cost</i> .....	\$5,197/ year
<i>Energy savings</i> .....	94,448 kWh/ year
<i>Financial savings</i> .....	\$6,826/year
<i>MTCO2e Savings</i> .....	60 MTCO2e/ year
<i>Cost per MTCO2e reduced</i> .....	\$86.61

**CM GREEN BUILDING**



Bellevue’s Green Team started as a multi departmental team with expertise in green buildings and sustainable development. City staff members who are LEED AP certified and trained in Low Impact Development (LID) practices are providing review of current building codes for alignment with best practices for both LID and green building. Development Services staff encourage greener development in Bellevue by providing access to resources, knowledgeable support, and expert review of green building projects.

In 2012, there were 22 projects in the City of Bellevue that have been awarded LEED certification, and 24 projects that had registered for LEED certification. LEED Certification is expected to grow as the City’s capacity to support, incentivize, and market these projects continues to increase.

The City has pursued green building features at City Hall (ENERGY STAR-certified) and the Mercer Slough Environmental Education Center (LEED Gold-certified) and installed green roofs at the Lake Hills Ranger Station and Lewis Creek Park. The Bellevue Botanical Gardens Visitor Center is currently planned for a major renovation and will also likely incorporate green features such as a green roof and day-lighting. The City of Bellevue plans to continue to pursue cost-effective green building features when constructing or renovating facilities. Studies show that these buildings provide cost savings over their lifetime and are healthier places to work and live.

## C HOME ENERGY REPORTS



Nearly 35,000 Bellevue residents received free Home Energy Reports showing how their energy use compares with similar-sized homes in their neighborhood. The Home Energy Reports, sent to nearly 100,000 homes on the Eastside, offer participants an environmentally friendly way to “beat the Joneses.” In addition to comparing energy use, the reports offer tips for cutting household consumption of gas and electricity. Eastside residents who received the reports responded to the comparison challenge and cut their use. Altogether, over the course of the 14-month program, residents saved more than \$4.2 million on their electricity and gas bills.

In addition to saving money, participants in Bellevue, Kirkland, Issaquah, Mercer Island, Redmond, Renton, and Sammamish collectively have averted more than 15.6 million pounds of carbon dioxide emissions and saved 9.3 gigawatt hours and 1.3 million therms of energy. This is roughly equivalent to taking 801 homes off the grid for a year, or 1,360 cars off the road for a year.

Across all cities, an 800 percent return on investment was seen with the average home saving about \$45. Bellevue alone averted 4.5 million pounds of carbon dioxide emissions, the equivalent of taking 389 cars off the road for one year. Bellevue households receiving the reports are saving an average of \$38 in energy costs per month, while each home energy report cost the City \$5 to produce.

<i>Project start and end date</i> .....	November 2010 to present
<i>Upfront Cost</i> .....	\$350,000
<i>Funding Source</i> .....	ARRA and PSE (\$175,000 each)
<i>Annual Energy Savings</i> .....	TBD
<i>Annual Financial Savings</i> .....	\$38.18 per Bellevue household; \$4.2 million for all eastside households
<i>Annual MTCO<sub>2e</sub> Reduction</i> .....	7,076 MTCO <sub>2e</sub>
<i>Cost per MTCO<sub>2e</sub> reduced</i> .....	\$49 (assuming one year lifespan of behavior change)

## © WATER CONSERVATION PROGRAM



In 2011, Bellevue supplied over 5.73 billion gallons of water to a population of 123,400, with a daytime work force that increases the population to 130,900. Bellevue’s water system is fully metered. The City does its part to conserve by:

1. Minimizing water loss caused by leaks throughout its distribution system. Distribution system leakage or water loss was 8.7 percent of total consumption in 2011, below the Washington State standard of 10 percent.
2. Offering water efficiency programs to encourage customers to conserve through the City’s partnership with Cascade Water Alliance.

Conservation programs seek to reduce indoor and outdoor water use by promoting high efficiency plumbing fixtures, appliances, and irrigation technologies, as well as leak detection and repair.

WATER CONSERVATION SAVINGS	JAN 2008 - DEC 2011
Toilets & Urinals	30%
Showerheads & Faucet Aerators	23%
Toilet Leak Detection	26%
Commercial Kitchens	10%
Clothes Washers	10%
Irrigation	1%
<b>TOTAL</b>	<b>566,453 gpd</b>

<i>Program Start and End Date</i> .....	Bellevue’s water conservation program began in 1987; current water conservation goal was established in 2007.
<i>Funding source</i> .....	Water fund
<i>Goal</i> .....	Achieve 355,000 gallons per day (gpd) in savings by the end of the six-year period (2008 – 2013). This translates to an average of 59,000 gpd of new saving each year.
<i>Water savings</i> .....	566,453 gpd from Jan 2008- Dec 2011



## © SUNSHOT INITIATIVE FOR SOLAR ENERGY



The Department of Energy is launching a nationwide effort to make solar energy more accessible and affordable, increase domestic solar deployment, and position the U.S. as a leader in the rapidly-growing global solar market.

The SunShot initiative’s goal is to cut red tape—streamlining and standardizing permitting, zoning, metering, and connection processes—and improve finance options to reduce barriers and lower costs for residential and small commercial rooftop solar systems.

The Washington State Department of Commerce team received \$523,800 to create an online permitting system, shorten permitting processing turnaround times, and fix fees through this effort. The team is working to eliminate the use of external disconnect switches and will lift system size and program capacity limits. DOE will award \$12 Million to 22 teams nationwide to help reduce barriers and serve as models for other communities.

The Washington State Department of Commerce team includes the following partner organizations: Cities of Seattle, Bellevue, Edmonds, and Ellensburg; Northwest SEED; Solar WA; Thurston Energy; Sustainable Connections; and serving power utilities.

<i>Program Start</i> .....	2012
<i>Funding source</i> .....	Federal Department of Energy Grant, in-kind labor contribution of \$10,000 from Bellevue staff
<i>Grant amount</i> .....	\$523,800 (Bellevue’s share of the grant is \$65,000)

# Materials Management & Waste



## M PAPER USE REDUCTION



In April 2008, the City passed a double-sided printing policy for all black and white printers/copiers in City Hall. This reduced the number of prints by 17 percent between April 2008 and March 2009. The overall savings due to the reduction in paper usage was \$7,797 in that year.

Other paper-reduction initiatives include e-billing for customers, fire stations eliminating paper dispatch records, and employees receiving paperless paychecks.

The City of Bellevue, led by the Finance Department and the Resource Conservation Team, made a goal to reduce paper use by 5 percent in 2010. Through education, copier consolidation, and more scanning options, Bellevue employees reduced paper copies by more than 10 percent in 2010, and reduced prints by another 11 percent in 2011 below 2010.

<i>Cost savings</i> .....	\$81,203 in printing and paper costs (2010); \$27,350.39 (2011 compared to 2010)
<i>Paper savings</i> .....	1.2 million sheets (2010); 556,500 sheets (2011 compared to 2010)
<i>MTCO2e savings</i> .....	7.6 MTCO2e compared to base year of 2009

## M IN-HOUSE RECYCLING PROGRAM



The City of Bellevue has a robust recycling and composting program at City Hall, the Bellevue Service Center, fire stations, and community centers. In addition, food waste composting is available at fire stations. Regular commingled recycling rate is 37 percent but does not include all specially-collected items below (2011 data):

TechnoTrash (e.g., electronic media, cases, video and audio tapes, small computer accessories, and cords): Containers in copy rooms at City Hall and loading docks at City Hall and BSC collect 480 lbs. annually.

### Battery Recycling at City Hall and BSC:

- Alkaline .....998 pounds
- Ni Cd .....303 pounds
- Lithium Ion .....4 pounds
- Lead Acid .....173 pounds

- Styrofoam                    5-7 times a year, a van load is delivered to V&G Styrorecycler.
- Ink Cartridge                In addition to ink cartridge recycling handled by City procurement, ECCO Recyclers pick up 30+ cartridges about every 6-8 weeks.
- Lids                             Collected 280 lbs. of rigid plastic lids in lunch rooms and delivered to AVEDA for recycling.
- Organics                      Diverted 60.56 tons of organics from the landfill in 2011 from nine fire Stations, City Hall, BSC, NBCC, SBCC, and Mercer Slough.

## C RESIDENTIAL HOUSEHOLD HAZARDOUS WASTE PROGRAM



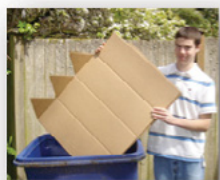
Outreach and education are provided to Bellevue residents regarding proper recycling or disposal of common household items that contain hazardous materials such as arsenic, lead, mercury or other poison. Targeted items include computers, televisions, batteries, cell phones, fluorescent lights, used motor oil, and unwanted medicine. Less toxic alternatives are promoted, where appropriate (i.e., green cleaning recipes). The City of Bellevue partnered with 16 local businesses to provide convenient locations for residents to recycle used motor oil or household hazardous waste.

RESIDENTS' AWARENESS OF PRODUCTS THAT CONTAIN HAZARDOUS MATERIALS AND NEED SPECIAL HANDLING (2006; 2010)

CONTAINS MERCURY	2006 – DEFINITELY/PROBABLY	2010 – DEFINITELY/PROBABLY
Thermostats	52%	69%
Fluorescent Light Bulbs	36%	51%
Computers	39%	51%

<i>Program Start and End Date</i> .....	1993 through present
<i>Funding Source</i> .....	Washington State Department of Ecology Coordinated Prevention Grant and King County Local Hazardous Waste Management Program Grant
<i>Annual Outcomes</i> .....	Consistent annual used motor oil recycling rate above 80 percent. Battery recycling events collected 3,304 pounds of lead acid and 3,542 pounds of alkaline in 2011.

## RESIDENTIAL RECYCLING PROGRAM



In 2011, Bellevue's robust single-family residents recycled 67.7 percent of their waste, which includes organics; multifamily and commercial tenants recycled 24.3 percent of their waste. Overall, Bellevue diverted 39 percent of garbage to recycling or composting in 2011 (including commercial).

<i>Start date</i> .....	Single-family recycling program began in 1989, and the multifamily program began in 1993.
<i>Tons of waste generated (2011)</i> .....	62,332 tons of waste (residential and multifamily)
<i>Tons diverted (2011)</i> .....	34,703 tons of waste diverted from the landfill in 2011 (residential and multifamily only)

## C BUSINESS WASTE REDUCTION & RECYCLING EDUCATION & TECHNICAL ASSISTANCE

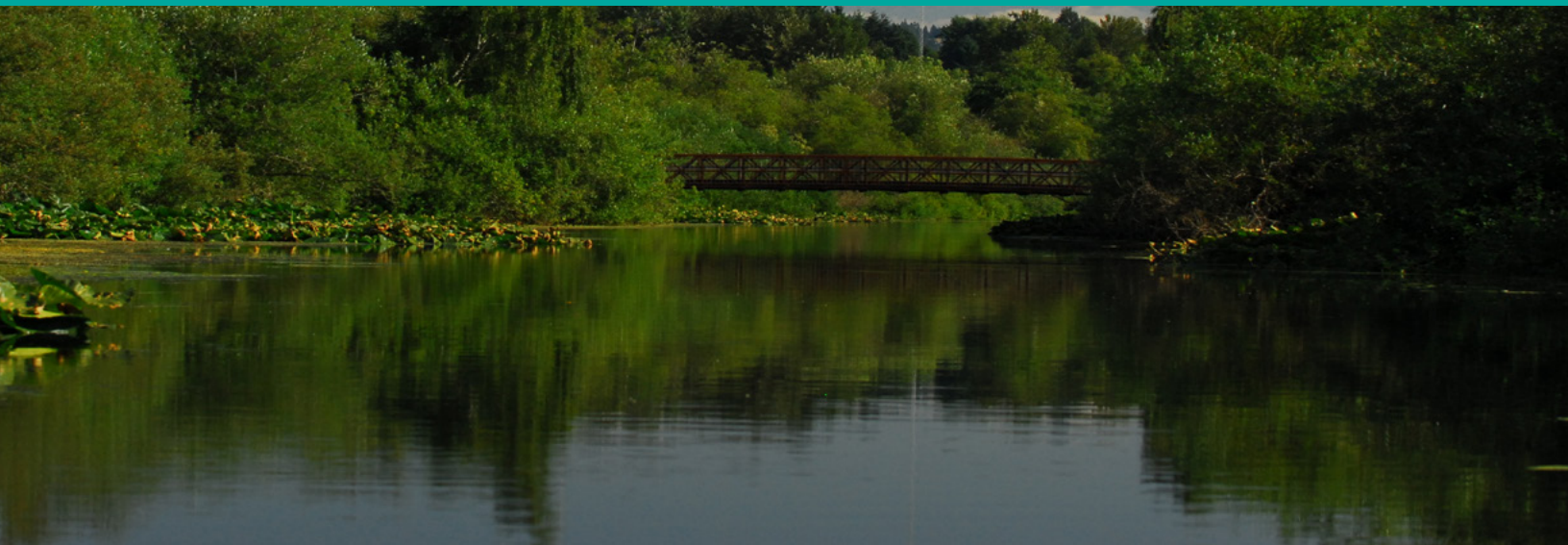


The City of Bellevue provides waste prevention and recycling assistance to Bellevue businesses and property managers through targeted outreach and onsite technical support. The Bellevue business community consists of approximately 10,000 businesses and 130,000 employees. Bellevue businesses consistently rank among the Best Workplaces for Waste Reduction and Recycling in King County. In 2011, 20 Bellevue businesses were awarded Best Workplaces for Recycling and Waste Reduction in King County.

<i>Program Start Date</i> .....	1991 through present; commercial recycling offered as a contract service by the City of Bellevue in 2004, but private services have been available for decades.
<i>Funding Source</i> .....	King County Waste Reduction and Recycling Grant and Solid Waste fund.
<i>Annual Outcomes*</i> .....	13,560 tons of waste diverted from the landfill in 2011. Assistance provided to a minimum of 100 businesses each year.

\*Incomplete information to determine commercial recycling rate because businesses may choose any hauler for recycling. Only Allied Waste is contractually obligated to report tonnage to the City.

# Ecosystems & Open Spaces



## © POLLUTION PREVENTION EDUCATION AND TECHNICAL ASSISTANCE



The City provides education and outreach on pollution prevention best management practices to Bellevue businesses to help them comply with City code requirements. Assistance includes brochures, posters, ads, and onsite technical assistance.

The City also marks storm drains on private property with the message, “Don’t Pollute, Drains to Stream” after obtaining written permission from property owners. The City marked all 15,000+ of its public storm drains with this permanent message, educating the public and reducing pollutants entering Bellevue waterways via public drains from non-point sources. The 4-inch, colorful plastic markers proved to be highly visible and are expected to last up to 15 years.

Coal Creek Watershed residents were sent information and a pledge card promoting BMPs for stormwater pollution prevention (car washing, pet waste, and natural yard care) and tools to promote the desired behaviors were sent to those who pledged. Eleven percent returned the pledge card from Coal Creek and five percent of Kelsey Creek residents returned their pledge (over three percent is considered fantastic).

## CM STREAM TEAM STORMWATER PROGRAM



The Stream Team Mission is to increase community awareness about stormwater issues through multiple methods of outreach and provide opportunities for community involvement by inviting citizens to help monitor and restore local streams. The result of these efforts is informed citizens who appreciate our natural resources, are stewards of our local waterways, and help spread information throughout the community. The Stream Team Program has several goals that are achieved through a variety of programs about salmon, streams, and other stormwater topics. The goals are to:

- Provide information
- Increase community awareness
- Increase community involvement
- Initiate changes that will protect water quality and habitat
- Prevent pollution
- Comply with external federal and state regulations and recommendations, including NPDES (National Pollution Discharge Elimination System), WRIA 8 (Watershed Resource Inventory Area 8 also known as the Cedar/Sammamish/Lake Washington Watershed), and the Endangered Species Act
- Provide services consistent with the Utilities Strategic Plan, the City of Bellevue Comprehensive Plan, and Bellevue’s Core Values (as measured by performance indicators)

Stream Team volunteers gather important information about Bellevue’s streams, lakes, and wetlands and help improve the City’s fish and wildlife habitat in a variety of ways:

- **Salmon Watcher:** monitor local streams for salmon returning in the fall, visiting a site for 15 minutes twice a week from September through December and reporting when, where and what type of salmon are sighted. Attend two-hour workshop in September.
- **Peamouth Patrol:** check local streams for 15 minutes twice a week from mid-April through May. Record spawning times and use of Bellevue streams. Attend one-hour workshop in April.
- **Earth Day/Arbor Day:** Plant native plants near streams and in wetlands.
- **Collect insect samples** from Bellevue streams for water quality monitoring.

In addition to the volunteer efforts, Stream Team provides outreach programs ranging from presentations for schools about our local salmon and streams, to staffing displays at public events and working on educational signage on topics like preventing pollution.

<i>Start date</i> .....	1988
<i>Funding source</i> .....	Stormwater fees
<i>Goal/ outcome</i> .....	Stream Team has about 150 volunteers who donate an average of 700 volunteer hours per year. Volunteers make over 700 stream visits per year monitoring for fish and sampling stream bugs. In addition, over 3,000 students have engaged in Stream Team programs.

## © NATURAL YARD CARE PROGRAM



The Natural Yard Care (NYC) program provides education and how-to-resources to Bellevue homeowners on yard care best management practices to encourage yard care behavior change to conserve and protect water resources, reduce yard waste, and enhance public health. The desired behavior changes correlate directly with the five steps of NYC: 1) build healthy soil, 2) plant right for your site, 3) practice smart watering, 4) think twice before using pesticides, and 5) practice natural lawn care.

NYC practices are promoted through seasonal NYC workshops and the City’s communication avenues. A NYC workshop series was successfully held at Bellevue City Hall in spring 2011. Homeowners from the Coal Creek watershed and the Factoria neighborhood area were invited to participate, but the workshops were open to all interested homeowners. A total of 90 homes participated in the 5 workshops. The program earned an overall satisfaction rating of 98 percent, with 88 percent of the participants pledging to implement the NYC techniques they learned.

NYC tips and resources are regularly featured in Bellevue’s *It’s Your City* newspaper and on the City’s website. A popular resource is the City’s Natural Gardening series which includes a seasonal gardening calendar and guides on the following topics: garden design, choosing the right plants; lawn alternatives; lawn care; soil building; mulching; fertilizing; composting food and yard debris; efficient watering; and natural pest, weed, and disease control. The guides are also available through workshops, City Hall, and the Bellevue Botanical Garden. Approximately 3,500 printed guides were distributed in 2011.

NYC practices are also modeled and promoted through the City’s Waterwise Garden at the Bellevue Botanical Garden. Community volunteers donated approximately 550 hours in 2011, working in the garden while learning more about Waterwise plants and natural care practices.

<i>Program Start and End Date</i> .....	2003 to present
<i>Funding source</i> .....	Water fund, Washington State Department of Ecology Coordinated Prevention Grant, and a grant from the Local Hazardous Waste Management Program of King County
<i>Outcomes</i> .....	In 2011, workshop attendees were asked to sign a pledge to take action on natural yard care. A pledge rate of 88 percent was achieved for the spring series. Research shows workshop attendees will share natural yard care information and practices with 5-7 additional people, extending the reach of the program.



