



Credit: Hugh Jennings

ENVIRONMENT

WHAT YOU WILL FIND IN THIS CHAPTER

- ▶ Information about the health of Bellevue's natural environment.
- ▶ Policies that seek to protect and enhance natural resources such as critical areas, aquatic resources, and tree canopy.
- ▶ Policies that provide a framework for reducing greenhouse gas emissions and reducing air and noise pollution.
- ▶ Policies that address minimizing our impacts on the environment through green building and curtailing waste.

ENVIRONMENT VISION

BELLEVUE EMBRACES ITS STEWARDSHIP OF THE ENVIRONMENT BY PROTECTING AND RETAINING NATURAL SYSTEMS, AND BUILDING FOR A SUSTAINABLE FUTURE.

As growth and development occurs, Bellevue is working to build a healthier, greener, and more sustainable future for generations to come. New buildings are designed to protect and even restore natural systems. The community highly values and celebrates the results, such as reduced energy use and greenhouse gas emissions, increasing tree canopy, and more salmon in local creeks.

INTRODUCTION



Credit: Hugh Jennings

The City of Bellevue has long been known as the “City in a Park.” Located between the shores of Lake Washington and Lake Sammamish, Bellevue is surrounded by unique, environmentally sensitive wetlands and urban forests that provide amenities for residents and key habitat corridors for wildlife. Bellevue is also a vibrant metropolitan city with gleaming skyscrapers, inviting shops, and diverse cultural attractions. Protecting and enhancing an urban ecosystem requires coordinated efforts by government, businesses, and individuals. The City of Bellevue serves as chief steward of the city’s environment and assumes responsibility for the implementation of many federal and state environment statutes. Through regulations, programs, and incentives, the city encourages the preservation, restoration, and improvement of the natural environment in an urban setting.

As Bellevue has matured, environmental sustainability has assumed a higher priority in public policy. A community that embraces sustainability must continually improve the relationship between the developed and natural environment, including:

- Minimizing the susceptibility of environmentally sensitive areas to damage
- Minimizing the rate at which resources are consumed
- Minimizing the amount of noise, waste and emissions generated
- Maximizing open space, habitat and opportunities for recreation ; and
- Improving infrastructure systems to support healthy living for people and wildlife

Bellevue evaluates the impact of administrative and legislative decisions on the urban environment – with particular attention to impacts on environmentally sensitive areas – and weighs the merits and costs of its environmental protection and enhancement against other important responsibilities (e.g. public safety, infrastructure needs, and economic development). Bellevue recognizes the importance of protecting an environment that has attracted so many people to the city while providing for the needs of the growing number of residents and businesses that call Bellevue their home.



WHAT DOES IT MEAN?

- ▶ Continuing growth and development in Bellevue has the potential to negatively affect the city’s environmental resources, particularly natural open spaces, water quality, and tree cover. Protection of environmental resources helps maintain community livability, as well as Bellevue’s image as a “City in a Park.”
- ▶ State law requires cities to plan for the protection of environmentally critical areas, such as wetlands and geologically hazardous areas. This element establishes policies for ensuring future development preserves the environmental benefits of critical areas, as well as making sure development does not occur in areas where environmental hazards exist.
- ▶ Increasing automobile travel and greater energy consumption has the potential to result in increased air pollution and carbon emissions.
- ▶ A growing array of tools and strategies exist to help mitigate the effects of urban development on the environment, and Bellevue is making use of many of these tools. Examples include Low Impact Development (LID) techniques for managing stormwater and green building standards for sustainable use of energy and resources in building construction.

TODAY'S CONDITIONS AND TOMORROW'S PROJECTIONS



ENVIRONMENT TODAY AND TOMORROW

Bellevue's 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.

While Bellevue is renowned for its streams, parks, forests, and fish, conditions in these environments have been on the decline. Along with significant population growth and development, Bellevue has witnessed declines in citywide tree canopy and increases in impervious surfaces and traffic congestion. These changes result in negative impacts that threaten the livability of Bellevue. However, there are some encouraging trends. There is a growing awareness of the contributing factors to climate change and an increasing willingness to lower greenhouse gas emissions and better protect the natural systems that provide valuable ecological services. There is a growing body of research with evidence of the emotional and psychological benefits of nature. As a result, there is an encouraging movement toward greener cities that celebrate biodiversity and strive to develop in ways that minimize negative impacts or even result in net-positive changes in environmental conditions.

CHALLENGES AND OPPORTUNITIES

Water Resources

Bellevue has a wealth of both surface and groundwater resources. There are about 79 miles of streams within the city limits; approximately 13 miles of large-lake shoreline (Lake Washington and Lake Sammamish); and 3 small lakes (Larsen Lake, Lake Bellevue, and Phantom Lake). The city's lakes, streams, wetlands, and groundwater aquifers are integrated natural systems that form the basis of the local water cycle. These streams and water bodies provide fish and wildlife habitat, convey stormwater flows, provide recreational opportunities, and enhance the community's aesthetic appeal.

Using the Benthic Index of Biotic Integrity (B-IBI) – a scoring system based on the type and number of macroinvertebrates in water samples – the health of water bodies can be quantified. B-IBI scores range from 10 (poor condition) to 50 (pristine condition). Scores below 36 are considered biologically impaired. B-IBI scores are significantly correlated with the amount of urbanization (i.e. percentage of impervious area) in a watershed – with lower scores expected when a watershed is more than 10 percent impervious. In recent years, large areas of Bellevue's lake and stream basins have experienced rapid development. As of 2008, 46 percent of the total area in Bellevue was impervious. Like most urban streams in the Puget Sound lowlands, all of Bellevue's major streams are classified as biologically impaired and have been impacted by urban development.

Stormwater

As in any urban areas, ensuring surface water quality will be a continuing challenge as further urbanization occurs and greater amounts of stormwater are discharged to lakes and streams.



WHAT ARE BENTHIC MACROINVERTEBRATES?

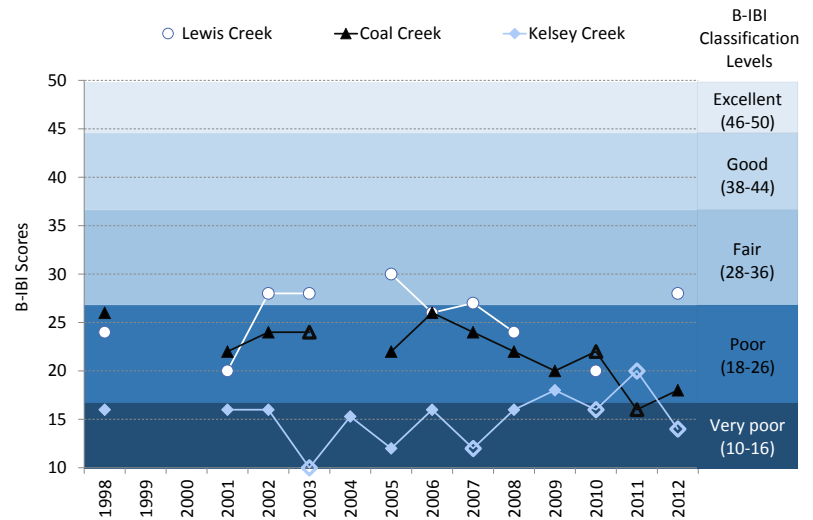
Invertebrates are any animals that lack a backbone, which describes the vast majority of animal species on earth.

Benthic macroinvertebrates are simply those animals without backbones that live in streams or river and are large enough to be seen with the naked eyes. Examples include many species of insects, crustaceans, or mollusks.

The B-BIBI scoring system monitors the number of macroinvertebrates in water samples because they provide a way to evaluate water quality.

Chemical testing for pollutants only provides a snapshot of conditions, but organisms living in water are affected by long-term conditions. The number and type of macroinvertebrate species present provides information about the long-term water quality in a body of water.

Figure EN-1. Bellevue Stream Water Quality



Preventing pollution at its source is a more effective method to protect surface water quality than treatment after contamination has occurred. An approach to controlling water pollution and providing flow control is through application of Low Impact Development practices with a focus on limiting impervious hardscape surfaces and retaining and restoring native soils and vegetation where conditions are suitable to do so.

There is strong evidence that non-point source pollution (pollution that comes from numerous sources, as opposed to pollution from a single source) is killing salmon and other aquatic inhabitants in our lakes, streams, and wetlands. Reducing non-point source pollution (e.g. contaminated runoff from impervious surfaces such as streets, parking lots and rooftops) remains a priority. Each individual, business, and government entity is a potential contributor to water quality improvements by reducing or eliminating soil erosion; limiting the use of herbicides, pesticides and fertilizers; and properly using and disposing of oil, grease, and hazardous materials. Bellevue works to reduce pollution by educating residents and businesses about water quality problems; demonstrating on-site pollution control techniques such as

bioswales and rain gardens; providing guidelines for landscaping and parking lot maintenance; and participating in regional water quality monitoring to address contamination issues and gauge the effectiveness of water quality control measures.

Critical Areas

Bellevue's natural environment is composed of a wide variety of land forms, soils, water courses, and vegetation. Construction and development activities alter the natural environment. Some areas of Bellevue have topographical, geological, hydrological, and vegetation characteristics that are compatible with development of varying intensities while other areas are incompatible. The city regulates land use and development activities to protect public health, safety, and welfare as well as certain critical areas – such as wetlands, aquifer recharge areas, geologically hazardous areas, floodplains, and fish and wildlife habitat conservation areas – that are especially susceptible to the negative impacts of development.

WHAT ARE CRITICAL AREAS?

The Growth Management Act requires cities and counties to adopt regulations for the protection of environmentally critical areas, which include wetlands, aquifer recharge areas, fish and wildlife habitat conservation areas, areas of frequent flooding, and geologically hazardous areas. Critical areas may not be suitable for development, either because they are environmentally sensitive, or it is not safe to build near them.



Credit: Hugh Jennings

Wetlands

Wetlands are integral to Bellevue’s urban landscape and the local hydrologic cycle. They reduce floods, contribute to stream flows, and improve water quality. Each wetland provides various beneficial functions, but not all wetlands perform all functions, nor do they perform all functions equally well. Large wetlands and wetlands hydrologically associated with lakes and streams, have a relatively more important function in the watershed than small, isolated wetlands.

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. Undeveloped land adjacent to a wetland provides a buffer to help minimize the impacts of urbanization. The long-term success in function of the wetland is dependent on land development strategies that protect and restore wetland buffers. Science indicates that an undeveloped vegetated buffer is equally as important as the wetland itself as it contributes to the function of the wetland by providing wildlife habitat, retaining stormwater, filtering sediment and pollution, and moderating water temperature. Through acquisition and regulation, Bellevue has successfully protected larger wetlands and many wetlands associated with streams – recognizing and preserving the multiple and related functions of wetlands and streams. In addition to fish and wildlife benefits, publicly-owned wetlands provide significant value to the community in the form of open space, passive recreation, education, and cultural resources. Privately-owned wetlands are important components of the hydrologic cycle and if properly managed, can provide amenities for property owners.

Geologic Hazard Areas

There are a variety of geologic hazards in Bellevue including steep slopes and seismic and coal mine hazards. Slopes over 40 percent are considered steep slopes and regulated as critical areas. The northern edge of the Seattle Fault (a thrust fault zone two to four miles wide that extends from the Kitsap Peninsula near Bremerton to the Sammamish Plateau) runs through Bellevue approximately parallel to I-90 and is considered capable of generating a magnitude 7.0 to 7.5 earthquake. Soil liquefaction could occur during an earthquake in certain areas – such as on non-engineered fills, peat soils, and recent alluvial deposits. The potential frequency and risk of a seiche - an oscillation of an enclosed body of water caused by seismic motion or large landslide displacement – in Lake Washington and Lake Sammamish is being studied. Some areas of the Newcastle Subarea are potentially impacted by past coal mining practices that left underground voids which can cause the ground surface to subside. Mine openings, waste dumps, fire hazards, and underground gases pose other risks. Catastrophic risks could include ground openings and localized subsidence. Subsidence that occurs over a large area can cause non-catastrophic problems such as foundation cracks, roadway failures, and separation of utility pipes.

Engineering provides some solutions to environmental constraints associated with geologic hazards, but such solutions must be evaluated for suitability in individual circumstance. One of the most cost effective methods of preserving slope stability is the preservation of native vegetation and retention of forested conditions within and at the top of geologic hazard areas. In addition to providing significant habitat value in areas of high opportunity (bands of steep slope areas extend throughout the city often providing habitat corridors in highly urbanized areas), preservation of vegetation and forest features helps prevent erosion, retains important soil binding root systems, and provides valuable open and greenspace.





Frequently Flooded Areas

Flooding is caused by excess surface water runoff and is exacerbated when eroded soil from cleared land or unstable slopes reduces the waterway's natural capacity to carry water. Construction and development activity within the floodplain reduces the floodway capacity. Flooding causes significant public safety problems, extensive property damage, and habitat destruction.

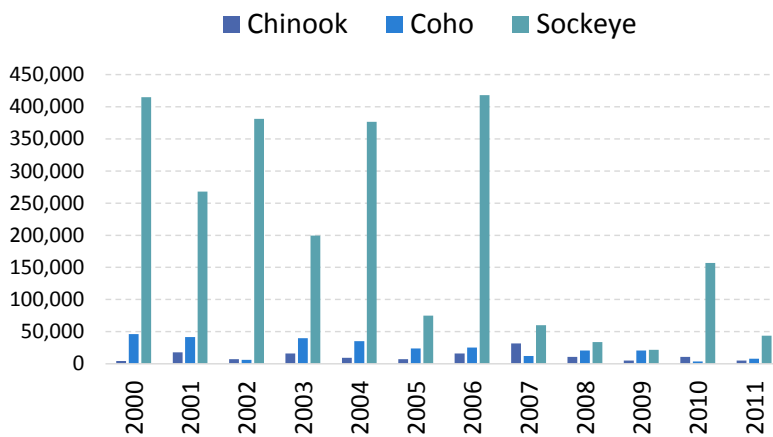
Numerous small floodplains exist in areas of Bellevue, such as along Coal Creek west of I-405; Kelsey Creek through the Lake Hills Greenbelt, Glendale Golf Course, and Kelsey Creek Park; Valley Creek near Highland Park; Richards Valley; and the shoreline of Lake Sammamish. Under the Federal Flood Insurance Program some floodplain development is allowed if eligibility requirements are met. The city regulates land uses and land alteration activities to minimize the potential for damage from flooding.

Fish and Wildlife Habitat Conservation Areas

Designated fish and wildlife habitat conservation areas in Bellevue include riparian corridors, wetlands, naturally occurring ponds, lakes and shorelines, and steep slopes over 40 percent. Other lands may be given special consideration for fish and wildlife habitat if there is a primary association with an endangered, threatened or sensitive species. Some of these areas are discussed and inventoried in other sections of this element, such as the water resources section, and in the Shoreline Management Element. The city seeks to protect and sustain the existing natural functions of these areas and encourages the enhancement of areas that have been degraded in the past.

Special status wildlife are those designated by federal or state government agencies as endangered, threatened, proposed, candidate, sensitive, and monitor species, and species of local importance in King County. Of the 23 special status species known to exist in Bellevue in 2002, 13 live in the city full time or breed here, and ten are migrants or are rarely observed. The Chinook salmon and the bald eagle are both threatened species that are commonly found in Bellevue.

Figure EN-2. Lake Washington Salmon Species Migration



Credit: Hugh Jennings

The Kelsey Creek basin is the primary Chinook salmon stream system in Bellevue. Coal Creek also provides Chinook habitat. Coho and sockeye salmon have been seen in most of Bellevue’s streams where suitable and accessible habitat exists. Salmonids migrate through portions of Lake Washington and Lake Sammamish within Bellevue’s jurisdiction. Along these migration routes, the nearshore environment provides important habitat functions and values, including cover from predator species. Chinook salmon and their habitat are protected under the Endangered Species Act (ESA). City monitoring of fish species in Bellevue’s streams indicates that the abundance and diversity of fish have remained mostly steady in recent years, but the number of salmon spawning in Bellevue’s streams has declined, similar to regional trends.

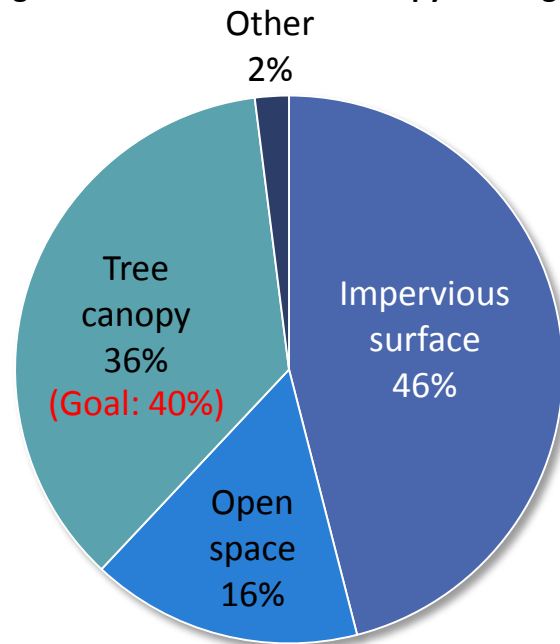


Credit: Bob Cerelli

Tree Canopy

Bellevue’s urban tree canopy provides habitat, stormwater management services, oxygen, carbon capture, and a buffer for urban noise and visual pollution. Beyond the trees themselves, vegetation and soils in natural areas reduce the velocity, temperature, and amount of water flow during storms. Development projects that result in tree loss rob the community of all of these critical ecosystem services. Tree canopy in Bellevue has decreased 20 percent since 1986, a loss conservatively estimated to be equivalent to \$15 million in lost stormwater services and \$68,000 per year in lost air quality removal services. Continuing on this trend will jeopardize Bellevue’s cost of living, quality of life, and image as a “City in a Park.” As a critical part of the equation for greenhouse gas reductions, Bellevue’s existing tree canopy stores roughly 332,000 tons of carbon in wood. Bellevue’s tree canopy city-wide is currently 36 percent. American Forests recommends a city-wide goal in urban areas of 40 percent tree canopy to maintain environmental benefits.

Figure EN-3. Bellevue Tree Canopy Coverage



Greenhouse Gas Emissions

Bellevue measures greenhouse gas emissions from municipal operations as well as community-wide activities. Bellevue has achieved nearly a 25 percent reduction in emissions from government operations since signing the Mayors Climate Protection Agreement (MCPA) in 2006. A 2011 inventory reveals emissions from the whole community are leveling off, reversing an alarming trend in emissions growth. In 2014, the King County Growth Management Planning Council (GMPC) unanimously voted to adopt countywide greenhouse gas emission reduction targets of 25 percent by 2020, 50 percent by 2030, and 80 percent by 2050. To meet these goals, significant emissions reductions are still needed.

Vehicle miles traveled, community electricity use, and community natural gas use account for over 98 percent of current emissions. Emphasis on actions to reduce emissions in these areas offer the most cost effective greenhouse gas emission reductions.

Ultimately, the long-term sustainability of a city is dependent on the quality of its transportation systems. Current trends are promising. Data suggests that a transition away from auto dependence is occurring, especially among people aged 21 to 30. Vehicle miles traveled in the Puget Sound Region has held steady for a decade, even as population has grown. Approximately 25 percent of Bellevue’s employees work for companies with Commute Trip Reduction programs. One-third of Bellevue residents commute to work in a way other than driving alone. Since 2000, transit usage in Downtown is up more than 500 percent, and transit statistics indicate increased usage city-wide. Demand for walkable, bikeable, and transit-oriented communities is increasing the value of real estate in communities that support those modes of transportation. To meet the transportation demands of the future and greenhouse gas emissions targets, 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.

Figure EN-4. Bellevue GHG Emissions

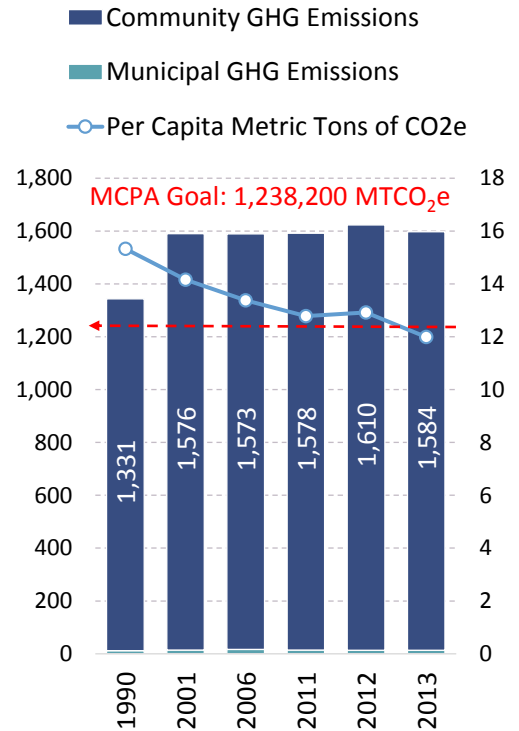
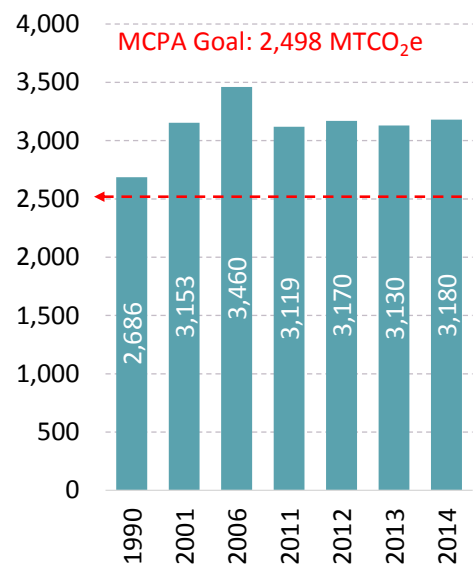


Figure EN-5. GHG Emissions of Bellevue’s Municipal Fleet

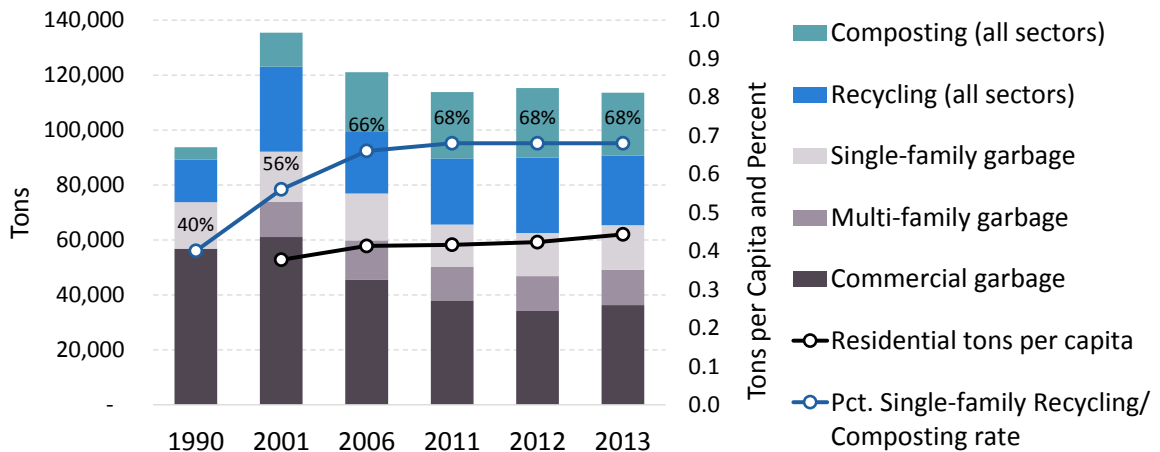




Waste and Materials Management

Increased material consumption and waste has historically been linked to rising standards of living. 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, almost two-thirds of all material discarded nationally still goes to waste in landfills or incinerators. There are some encouraging trends in diverting certain products – such as used cooking oils and various types of e-waste – from the waste stream and finding opportunities for reuse. Improving the sustainability of materials management requires both reducing waste through recycling, composting and waste prevention, as well as reducing the lifecycle impacts of materials through manufacturing design, producer responsibility for product disposal impacts, and educating people about consumption choices.

Figure EN-6. Solid Waste Generation and Diversion, 2001-2011



Bellevue has been a leader in recycling and waste reduction for decades. The amount of waste generated per household in Bellevue has declined since 2007. Bellevue's residential recycling and composting rate is 67.7 percent, among the highest in the state. 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 in times of economic growth.



BELLEVUE'S ENVIRONMENT PLAN



Through a combination of regulations, programs, and incentives, the city seeks to preserve the natural environment, mitigate the impacts of urban development, and restore habitat areas.

PROTECTING CRITICAL AREAS

Bellevue recognizes the importance of preserving the functions and values of various environmental features and realizes that such functions are difficult to replicate or replace once destroyed. Environmentally critical areas provide a myriad of functions and values that are important to the sustainability of Bellevue's urban environment. Bellevue's critical areas provide valuable habitat, protect and enhance water quality, facilitate stormwater conveyance, enhance local aesthetics, and offer recreation, cultural resources, and education opportunities.

Bellevue seeks to protect these functions and values through the use of a Critical Areas Overlay District which establishes a regulatory framework for critical areas and their buffers. Land use regulations applicable to development within the Critical Areas Overlay District are intended to guide development in a manner that preserves and enhances critical area functions and values.

Bellevue recognized the importance of critical areas and was an early adopter of regulations to ensure their protection. The city has been protecting critical areas since the 1980's and continues to do so. Regulations include, but are not limited to:

- Limitations on impervious surface coverage
- Designation of acceptable land use intensities
- Buffer and setback requirements
- Requirements for the location of certain uses
- Best management practices for clearing and grading activities
- Standards for pollutant control

These regulations protect the land's capacity to absorb and retain rainfall, safely convey stormwater, maintain water quality, and resist erosion. Preserving the functions and values of such areas reduces property damage, public safety hazards, and habitat destruction.

Enhancing Our "City in a Park"

Bellevue's park-like setting is defined by more than open spaces, ball fields and playgrounds. As a "City in a Park," Bellevue streams and lakes that are home to protected species of fish and other aquatic life; dense forests of madrona, cedar and Douglas fir trees where hundreds of species of birds and even large mammals can thrive; and unique wetlands that provide peacefulness, recreation, and a balanced web of ecosystem functions. These valuable environmental resources exist across multiple land use classifications and therefore require a restoration approach that prioritizes involvement from diverse stakeholders and takes advantage of opportunities for public-private partnership.

To counter the losses to citywide tree canopy over the last 30 years of intense urban development, new city policies call for establishing a citywide tree canopy retention target and developing an action plan for meeting the target across the many different land use types where tree canopy can exist (e.g. right of way, commercial, residential, and public lands).

PRESERVING HABITAT FOR SENSITIVE SPECIES

State law requires cities to give "special consideration" to the preservation or enhancement of habitat for anadromous fish. Anadromous fish are those species, such as salmon, that spawn in fresh water streams or lakes, migrate to salt water for a portion of their life cycle, and then return to fresh water. Provisions for anadromous fish and associated habitat protections are included in Bellevue's critical areas and shoreline regulations. Fish species listed as threatened or endangered under the federal Endangered Species Act (ESA) are protected in accordance with the Act. Bellevue coordinates its ESA responsibilities with regional salmon recovery planning efforts.

Bellevue has a strong history of protecting habitat for a variety of species. See policy direction below for specific guidance on protection of habitat resources.

BELLEVUE'S COMMITMENT TO BUILDING GREEN

Bellevue has demonstrated its commitment to sustainable development through a number of recent building projects. The Mercer Slough Environmental Education Center (MSEEC) was designed and built to have minimal impact on the environment. Special gutters, porous concrete, and catchment ponds slow and filter water runoff at the site. Green roofs at the site reduce impermeable surfaces and warming around buildings. Renewable, recycled, local materials, along with sustainably harvested wood were used in the construction of the buildings. In 2009, the city received a gold LEED (Leadership in Energy and Environmental Design) rating for the MSEEC.

Since then, two other Parks facilities have been constructed to LEED standards. The Bellevue Youth Theater is integrated into Crossroads Park with a green roof providing a natural insulator, resulting in significant energy savings while limiting the impact of stormwater runoff. The Bellevue Botanical Garden Visitor Center's new buildings are expected to achieve LEED Gold certification, as well. Bellevue City Hall also has a U.S. EPA Energy Star rating of 99 out of 100 and is one of the most efficient city halls in the nation.

To improve conditions for aquatic life in Bellevue's streams, all remaining barriers to fish passage that exist on public land are planned for removal by 2022. Yet it is not helpful or cost effective to improve conditions for aquatic life in one stretch of stream if scouring flows or pollutions are allowed to occur in another. Therefore the city will work in partnership with private land owners, often leveraging the resources of regional land conservation districts, to restore and enhance habitat.

Encouraging Low Impact Development and Green Building

Green building and Low Impact Development are key strategies to balancing urban growth with environmental protection and achieving Bellevue's long-term environmental sustainability. Green building reduces resource consumption and environmental impacts throughout the design, construction, and operation phases of development. Based on scientific standards, green building strategies promote sensitive site development and emphasize water savings, energy efficiency, materials selection, and indoor environmental quality.

One example of green building is Low Impact Development (LID). LID focuses on how stormwater enters, is stored and leaves a site. By mimicking natural systems, LID can help maintain or restore the natural hydrology of watersheds. Site design using LID principles incorporates vegetation and small-scale hydrologic control to capture, treat and infiltrate storm water runoff on site. When implemented throughout the watershed, LID can improve habitat by complementing the regulatory protections afforded to environmentally critical areas. LID techniques applicable to new development or redevelopment include: preserving native vegetation, natural drainages and porous soils; reducing impervious surfaces; diverting runoff from the storm drainage system to on-site infiltration systems; and clustering development.

Green building practices can be used by individuals on a small scale (e.g. home remodel) or on a broader scale (e.g. plat) and are applicable to residential, commercial, industrial, or institutional users. In addition to the environmental benefits, green building and Low Impact Development practices can also reduce long-term building operating costs, improve indoor health for residents and tenants, and add value due to consumer demand for energy and resource-efficient buildings.

Reducing Greenhouse Gas Emissions

Significantly reducing greenhouse gas emissions over several decades requires a wide range of strategies. Efforts discussed above that maintain healthy natural ecosystems, encourage green building practices, and ensure Low Impact Development are critical to success, but there is more that can be done. The bulk of greenhouse gasses emitted by the Bellevue community are traced back to fossil fuel energy sources in our built environment and vehicles. Increasing the adoption of cleaner and more renewable sources of energy in our homes and transportation modes has often proven to be more cost effective in the long-term while sparking innovative job markets and contributing significantly to greenhouse gas reduction in the short-term.

Bellevue will remain a leader in supporting clean technology such as renewable solar energy and electric vehicles. For example, in 2014, the city helped facilitate the Solarize Bellevue campaign, a community-purchasing program that helped reduce the cost of installing solar photovoltaic (PV) systems on local residences and businesses. The program resulted in 50 new solar arrays in Bellevue and a 140% increase in solar production communitywide. New technologies, coupled with educational campaigns promoting energy efficiency and conservation techniques will help the community transition to cleaner and more cost effective forms of energy.



Credit: A&R Solar

Belleveue has also emerged as a leader supporting the growth of electric vehicle adoption. Over 75 publicly available electric vehicle charging stations are located throughout the city, ensuring that residents, employees, and the city’s own fleet can take advantage of low-cost, zero-emissions forms of transportation. New technologies, coupled with mobility strategies such as mass transit, pedestrian/bike infrastructure, and transit-oriented development, which are elaborated upon in the Transportation Element, will help the community reduce the significant greenhouse gas emissions associated with today’s transportation infrastructure. Transportation policies TR-38, TR-140 and TR-143 also address greenhouse gas emissions and the use of emerging technologies.



Managing Materials to Reduce Waste

Throwing away valuable material translates into profound economic waste: Americans throw away \$11 billion in packaging materials and \$165 billion in food waste each year¹.

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 lifecycle.

The U.S. EPA reports that 42 percent of all U.S. GHG emissions can be attributed to the provision of goods and food². Progress in this field requires a shift to “materials management” -which looks upstream to the production and procurement stages of an object’s life cycle to ensure that materials being used can be optimally managed for waste prevention downstream. Products are produced with more environmentally friendly practices and materials, used in a manner that maximizes product efficiency and reduces waste (e.g. rechargeable batteries), and reused for their highest possible value in other products at the end of their useful life.

¹ Mac Kerron, C (2012). *Unfinished Business: The Case for Extended Producer Responsibility for Post-Consumer Packaging and Gunders, D. (2012). Wasted: How America Is Losing Up to 40 Percent of its Food from Farm to Fork to Landfill.*

² US Environmental Protection Agency (2009). *Opportunities to Reduce Greenhouse Gas Emissions through Materials and Land Management Practices.*

Bellevue can reduce the impacts of products it procures and influence greener product design throughout supply chains by adhering to Environmentally Preferable Purchasing Practices (EPPP).

Reducing Air and Noise Pollution

Many federal, state, regional, and local agencies enact and enforce legislation intended to protect air quality. Air quality in Bellevue, and in much of the Puget Sound area, is tied to controlling emissions from all sources, including: internal combustion engines, industrial operations, and indoor and outdoor burning. In the Puget Sound region, vehicle emissions are the primary source of air pollution. The city seeks long-term strategies to address air quality problems, not only on the local level, but in the context of the entire Puget Sound Basin with coordination and major direction from the Puget Sound Air Pollution Control Agency. Local and regional components must be integrated in a comprehensive strategy designed to improve air quality through transportation system improvements, vehicle emissions reductions, and demand management strategies.

Excessive noise is a form of pollution that has direct and harmful effects upon the public's health and welfare and adversely affects the livability, peace, and comfort of neighborhoods and the city as a whole. Noise, like many forms of pollution, is both a local and a regional problem. Noise that originates on residential, commercial, or industrial land within the city is regulated through enforcement of Bellevue's comprehensive noise control ordinance. Because commercial and industrial uses both generate the most noise and are the least sensitive noise receptors, the city's noise regulations are focused on protecting residential neighborhoods from excessive noise that could impact quality of life.

ELECTRIC VEHICLES

Bellevue has been a leader in supporting the growth of electric vehicle adoption. Over 75 publicly available electric vehicle charging stations are located throughout the city, ensuring that residents, employees, and the city's own fleet can take advantage of low cost, zero emissions forms of transportation.





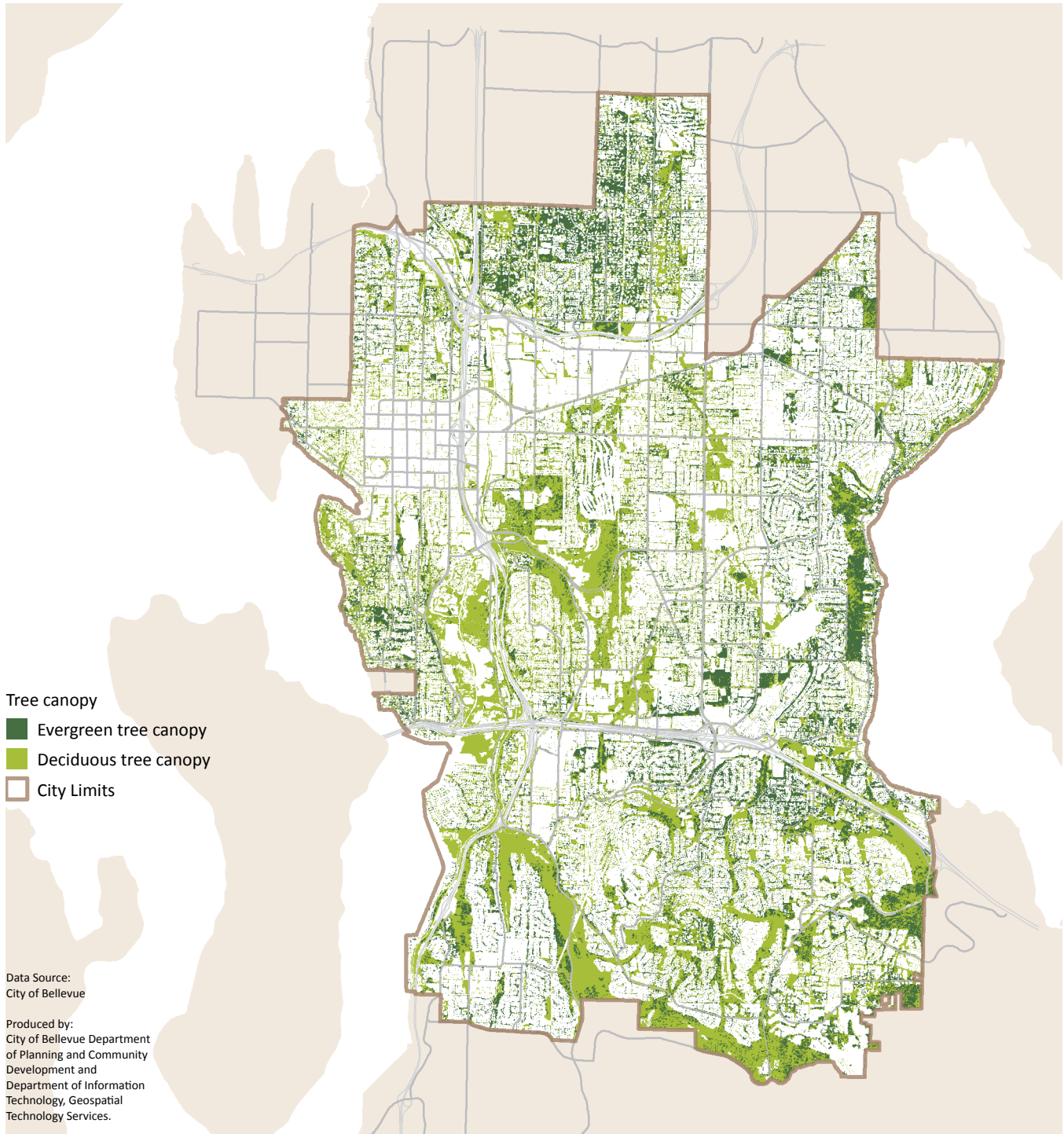
Traffic noise affects many residential neighborhoods. The city considers noise mitigation when designing new roadway improvements. Decisions on mitigation must include the full range of environmental analysis, as well as the impacts on community character. For example, while noise walls reduce the traffic noise in residential areas, they often seriously degrade the pedestrian environment and “harden” the street edge by walling off the street corridor from the adjoining neighborhood. The Transportation Element contains policies relating to traffic noise.

WHAT DOES SUCCESS LOOK LIKE?

- A trend of steadily decreasing GHG emissions and vehicle-miles-traveled (VMT), paired with a corresponding increase in transit ridership.
- Increased citywide tree canopy cover to meet the 40 percent standard recommended by American Forests.
- Increased percentage of waste recycled or composted, especially in the commercial sector.
- Steadily improving conditions in critical areas and fish and wildlife habitat areas.

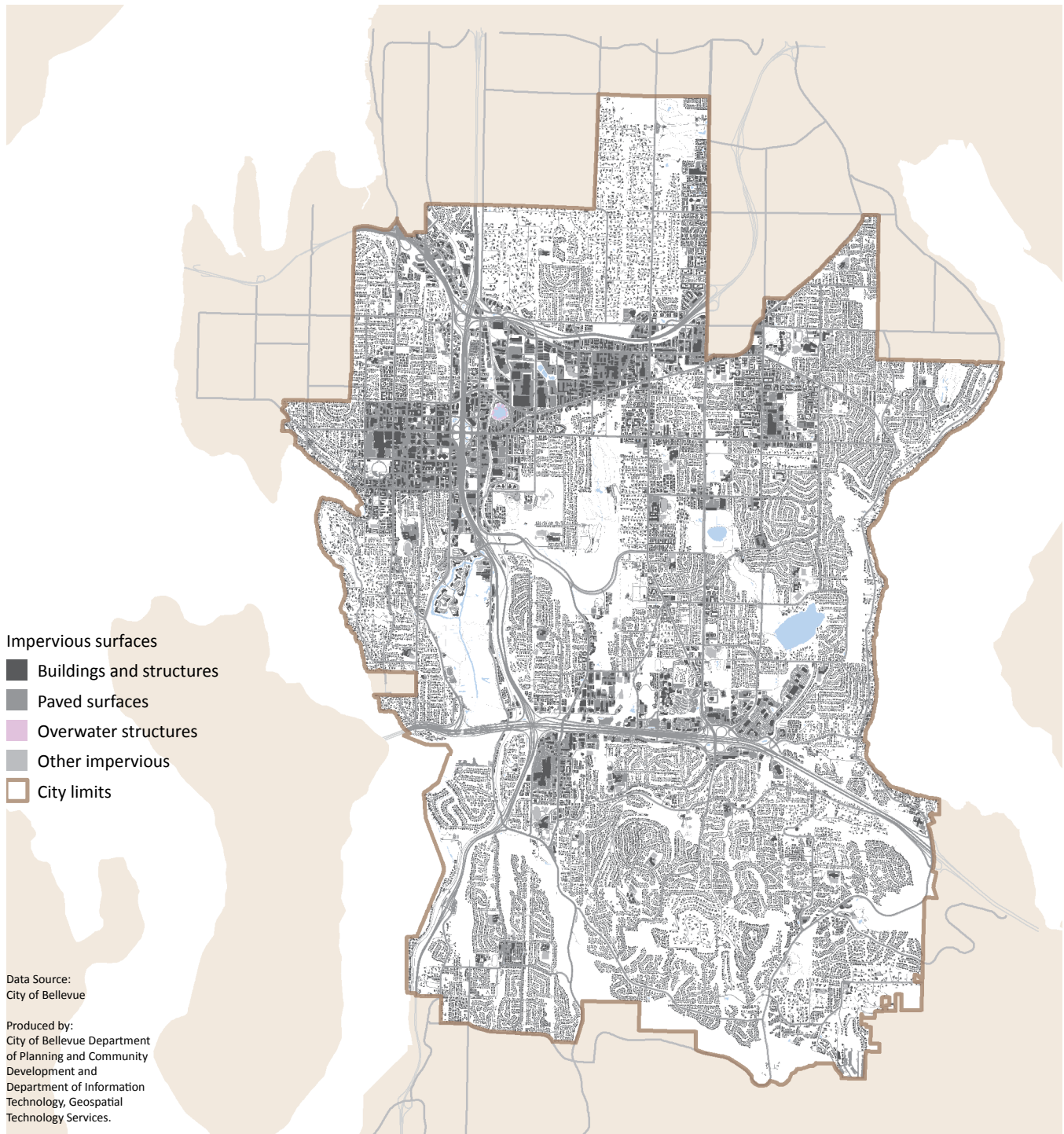
Map EN-1. Tree Canopy

This map shows evergreen and deciduous tree canopy in Bellevue in 2013. Tree canopy comprised about thirty-six percent of Bellevue landcover in 2013.



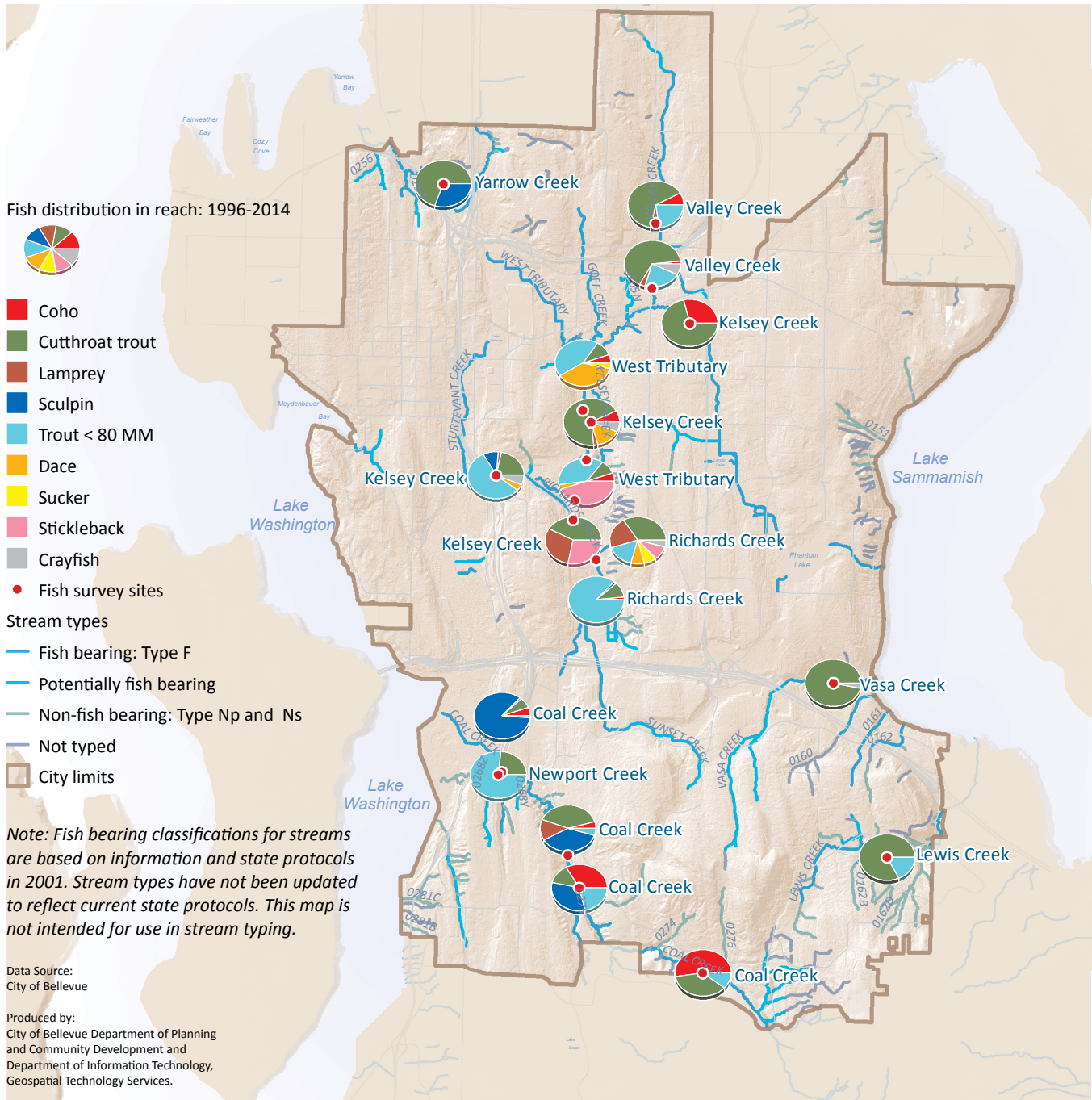
Map EN-2. Impervious Surface

This map shows impervious surfaces in Bellevue in 2013 including buildings and structures, paved surfaces and other impervious surfaces. In 2013, impervious surfaces comprised about 42 percent of Bellevue landcover.



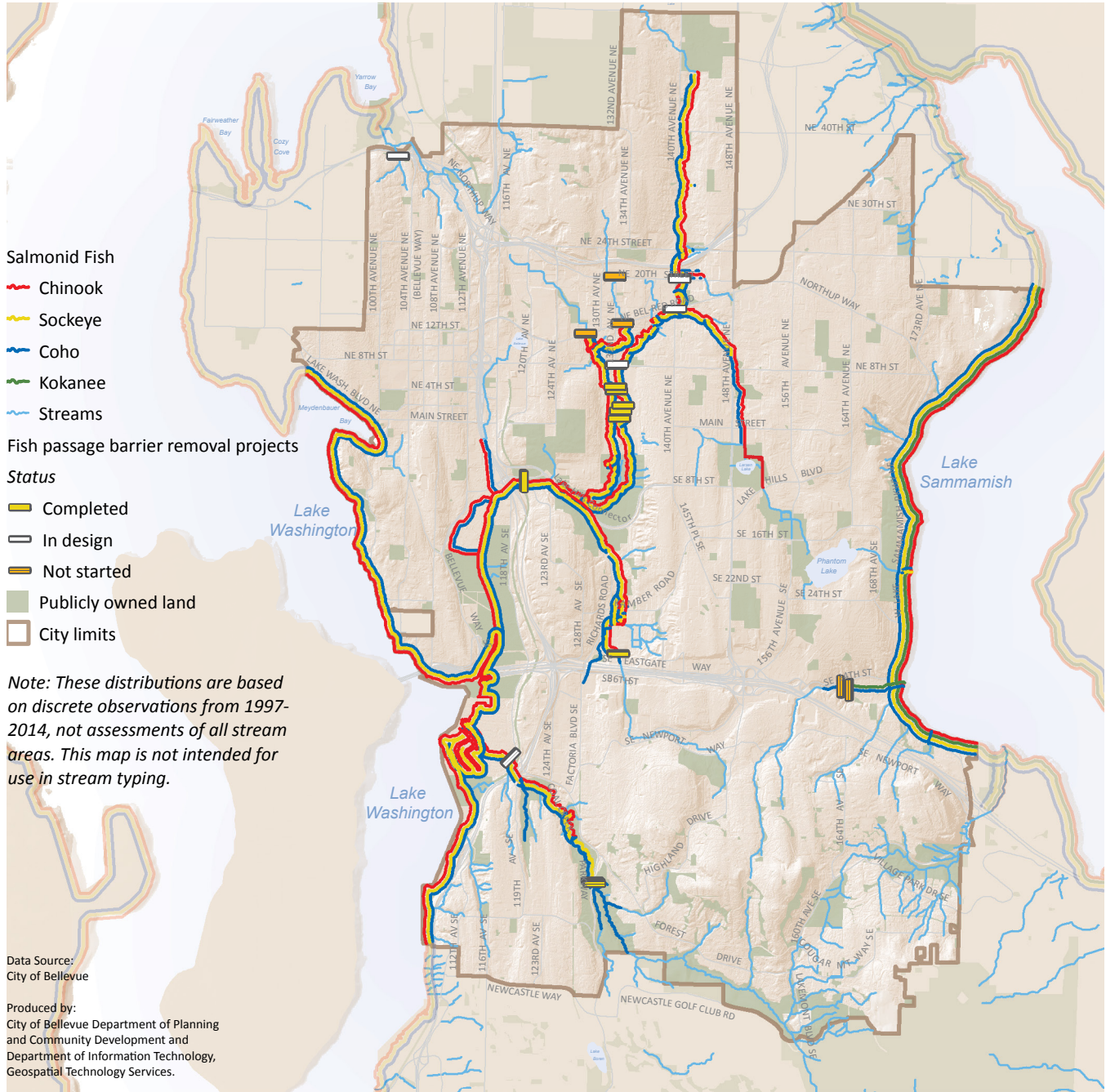
Map EN-3. Sampling of Summer Fish Species

This map shows fish-bearing and non-fish bearing streams in Bellevue along with the different resident fish species found within stream reaches during the summer months since 1996. Other salmonid fish species found in streams during the fall are shown in the Salmonid Distribution map. For more information, see [Summer Fish Monitoring Reports](#) and the [Stream Typing Inventory](#) report.



Map EN-4. Distribution of Spawning Salmon

This map shows the distribution of salmon that spawn in Bellevue streams during the fall, along with publicly owned lands and 22 priority public fish barriers identified in 2009. Some of the barriers are partial barriers restricting migration during low or high flows. More information about the state of the water system can be found in [Chapter six](#) of the [Storm and Surface Water System Plan](#).



Map EN-5. Critical Areas Overlay – Streams, Wetlands and Floodplains

Bellevue has numerous hydrologic features. This map is a graphic representation of known streams, wetlands, FEMA mapped floodplains, and fish and wildlife habitat areas within Bellevue.

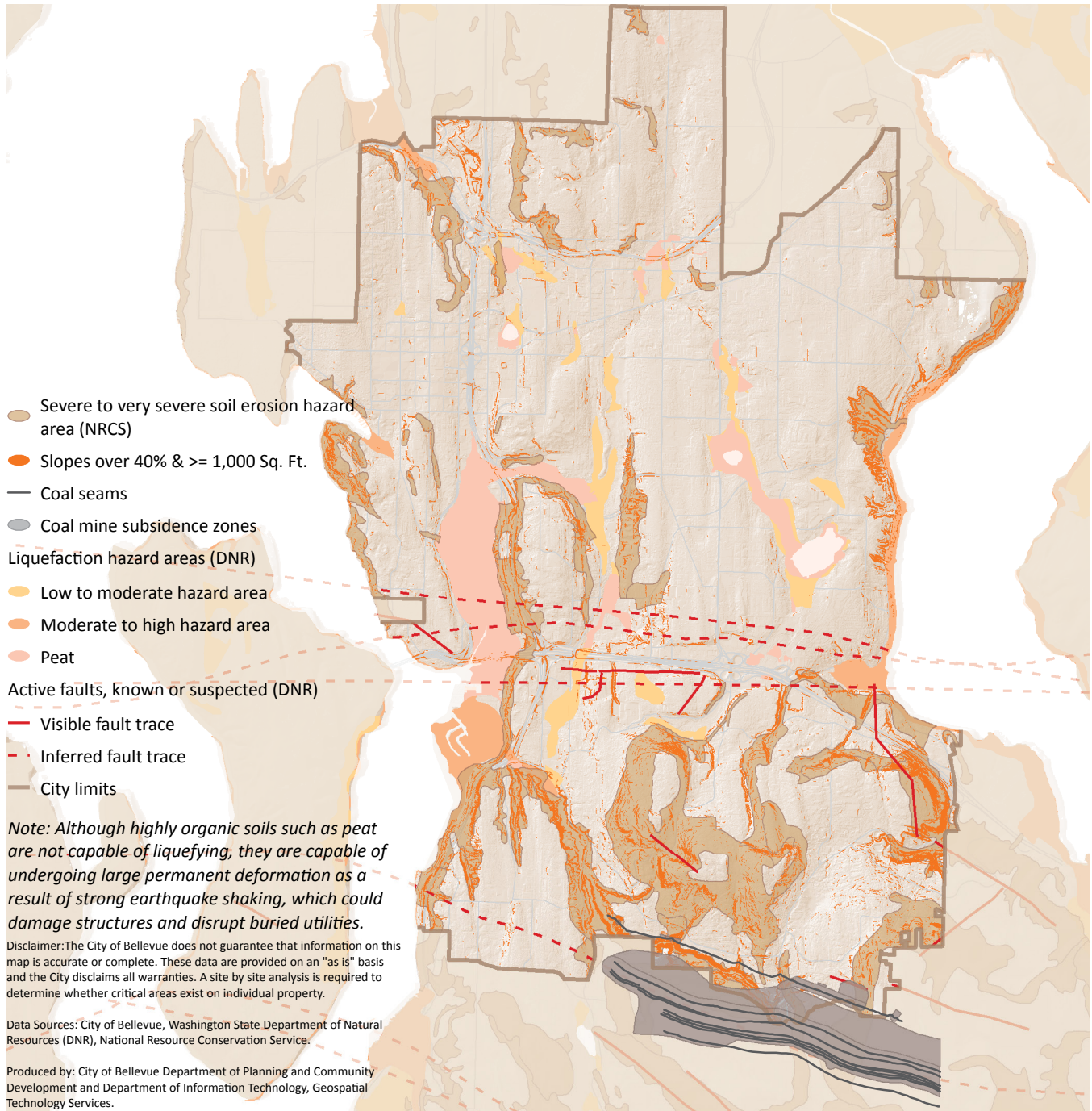
**The City of Bellevue does not guarantee that the information shown on this map is accurate or complete. Site specific field identification based on critical area definitions in Bellevue’s Land Use Code is required to determine whether critical areas exist on individual property. Flooding may occur in areas beyond (or outside) the mapped floodplain.*



Map EN-6. Critical Areas Overlay – Geologic Hazards

Bellevue has diverse geologic terrain. This map is a graphic representation of known earthquake fault lines, liquefaction zones, soil erosion hazards, steep slopes, and coal hazards including coal seams and coal subsidence zones within Bellevue. Bellevue works to protect against risks associated with these hazards.

**The City of Bellevue does not guarantee that the information shown on this map is accurate or complete. Site specific field identification based on critical area definitions in Bellevue’s Land Use Code is required to determine whether critical areas exist on individual property.*



GOALS & POLICIES

GOAL

Ensure that planning efforts, infrastructure investments, and municipal operations proactively manage natural resources to meet the needs of current and future generations while maintaining the integrity, stability and beauty of natural systems.

POLICIES

Environmental Stewardship

- EN-1.** Balance the immediate and long range environmental impacts of policy and regulatory decisions in the context of the city's commitment to provide for public safety, infrastructure, economic development and other obligations.
- EN-2.** Conduct city operations in a manner that ensures the sustainable use of natural resources, promotes an environmentally safe workplace for its employees, and minimizes adverse environmental impacts.
- EN-3.** Minimize, and where practicable, eliminate the release of substances into the air, water, and soil that may have harmful impacts on people, wildlife, or the environment.
- EN-4.** Promote and invest in energy efficiency and renewable energy resources as an alternative to non-renewable resources.
- EN-5.** Protect air, water, land, and energy resources consistent with Bellevue's role in the regional growth strategy.
- EN-6.** Establish an achievable citywide target and take corrective actions to reduce greenhouse gas emissions such as reducing energy consumption and vehicle emissions, and enhancing land use patterns to reduce vehicle dependency.





Credit: Mandar Phalak

- EN-7.** Develop and implement climate change adaptation strategies that create a more resilient community by addressing the impacts of climate change to public health and safety, the economy, public and private infrastructure, water resources, and habitat.
- EN-8.** Provide regional leadership on environmental issues that extend beyond Bellevue’s boundaries and require regional cooperation.
- EN-9.** Educate the public about environmental issues and illustrate how individual actions can have a cumulative effect to benefit the environment.
- EN-10.** Use life cycle cost analysis and best management practices in city projects and procurement to achieve effective environmental stewardship and long-term fiscal responsibility.
- EN-11.** Support partnerships between the city and private landowners to steward private lands, streams, habitat and other natural resources for public benefit.
- EN-12.** Work toward a citywide tree canopy target of at least 40% canopy coverage that reflects our “City in a Park” character and maintain an action plan for meeting the target across multiple land use types including right-of-way, public lands, and residential and commercial uses.
- EN-13.** Minimize the loss of tree canopy and natural areas due to transportation and infrastructure projects and mitigate for losses, where impacts are unavoidable.

Waste and Materials Management

- EN-14.** Reduce waste, reuse and recycle materials, and dispose of all wastes in a safe and environmentally responsible manner.
- EN-15.** Prioritize the use of products that are recyclable and made from recycled materials, or have other environmental attributes throughout their lifecycle.

- EN-16.** Engage in Environmentally Preferable Purchasing practices and support product stewardship to reduce waste to landfill and carbon emissions.
- EN-17.** Work with residents, businesses, and waste haulers to continue to improve percentage of waste diverted from landfill.



Water Resources

- EN-18.** Integrate site-specific development standards with urban watershed-scale approaches to managing and protecting the functions of critical areas.
- EN-19.** Retain existing open surface water systems in a natural state and restore conditions that have become degraded.
- EN-20.** Maintain surface water quality, defined as meeting federal and state standards and restore surface water that has become degraded, to the maximum extent practicable.
- EN-21.** Monitor surface water quality and implement measures to identify and address the sources of contamination.
- EN-22.** Employ the best management practices and technology, education, and enforcement strategies to minimize non-point source pollution.
- EN-23.** Retrofit public storm drainage systems and prioritize investments where there is a significant potential for restoring surface water quality important to preserving or enhancing aquatic life.
- EN-24.** Reduce runoff from streets, parking lots and other impervious surfaces and improve surface water quality by utilizing low impact development techniques in new development and redevelopment.
- EN-25.** Restore and protect the biological health and diversity of the Lake Washington and Lake Sammamish basins in Bellevue's jurisdiction.



- EN-26.** Manage water runoff for new development and redevelopment to meet water quality objectives, consistent with state law.
- EN-27.** Conserve groundwater resources.
- EN-28.** Allow existing farming and agriculture in wetlands and in the 100-year floodplain so long as water quality and buffer functions are not substantially impacted.

Geo Hazards

- EN-29.** Allow land alteration only for approved development proposals.
- EN-30.** Regulate land use and development to protect natural topographic, geologic, vegetational, and hydrological features.
- EN-31.** Protect geologically hazardous areas, especially forested steep slopes, recognizing that these areas provide multiple critical areas functions.
- EN-32.** Maintain updated geologic maps of the city, in conjunction with updates to regional geologic mapping efforts and other significant changes.
- EN-33.** Incorporate information from geotechnical reports and documented landslides and erosion problems into the city's Geographic Information System.
- EN-34.** Promote soil stability and the use of the natural drainage system by retaining critical areas of existing native vegetation.
- EN-35.** Prohibit development on unstable land and restrict development on potentially unstable land to ensure public safety and conformity with natural constraints.
- EN-36.** Require an analysis of soil liquefaction potential where appropriate, in the siting and design of structures and infrastructure.

- EN-37.** Use geotechnical information and an analysis of critical areas functions and values to evaluate the geologic and environmental risks of potential development on slopes between 15% and 40%, and implement appropriate controls on development.
- EN-38.** Require a structure setback from the top and the toe of a steep slope (40%+) to protect public safety.
- EN-39.** Use specific criteria in decisions to exempt specific small, isolated, or artificially created steep slopes from critical areas designation.
- EN-40.** Minimize and control soil erosion during and after development through the use of best management practices and other development restrictions.
- EN-41.** Provide information to the public about potential geologic hazards, including site development and building techniques and disaster preparedness.
- EN-42.** Regulate development in coal mine hazard areas by requiring that a project proponent (with review, oversight, and approval by the city):
- Conservatively evaluate risks.
 - Eliminate the potential for catastrophic effects and keep development out of catastrophic risk areas.
 - Mitigate any non-catastrophic impacts.
 - Protect ratepayers from costs associated with development in areas potentially impacted by mining.
 - Provide disclosure mechanisms to inform property purchasers of past mining activities.



Low Impact Development and Green Buildings

- EN-43.** Maintain land use regulations that limit the amount of impervious surface area in new development and redevelopment city-wide.



- EN-44.** Provide land use incentives to minimize the amount of impervious surface area below that allowed through prescriptive standards, in new development, redevelopment, and existing development citywide.
- EN-45.** Implement the city-wide use of low impact development techniques and green building practices.
- EN-46.** Make low impact development the preferred and commonly-used approach to site development to minimize impervious surfaces, native vegetation loss, and stormwater runoff.
- EN-47.** Construct and operate new city facilities to exceed required development standards in order to conserve energy, water, and environmental resources.
- EN-48.** Support the use of emerging best practices in the area of green building and site design through the use of pilot programs and model ordinances.
- EN-49.** Provide education and incentives to support the implementation of low impact development practices, integrated site planning, and green building, with a focus on early consideration of these in the site development process.

Air Quality

- EN-50.** Support federal, state, and regional policies intended to protect clean air in Bellevue and the Puget Sound Basin.
- EN-51.** Work with the private sector to reduce growth in vehicle trips as a key strategy for reducing automobile-related air pollution.
- EN-52.** Implement transportation projects that provide significant air quality improvements to areas with existing air quality problems, even where the project does not bring all locations up to adopted standards, provided that the project is the best feasible solution and it significantly improves the air quality at each substandard location.

- EN-53.** Provide transportation improvements for the purpose of relieving localized air quality problems by shifting traffic to less congested facilities nearby, provided this does not encourage cut-through traffic in neighborhoods.
- EN-54.** Promote the use of alternative fuels such as electricity and compressed natural gas and evaluate the use of such fuels for the city's vehicles.
- EN-55.** Maintain the ban on outdoor burning within the urban area and encourage the composting of leaves and other yard debris and other actions as alternatives to burning.
- EN-56.** Reduce the amount of air-borne particulates through a street sweeping program, dust abatement on construction sites, and other methods to reduce the sources of dust.



Credit: Hugh Jennings

Fish and Wildlife Habitat

- EN-57.** Provide incentives to private property owners to achieve specific habitat improvement goals, including retention and enhancement of native vegetation.
- EN-58.** Encourage property owners to incorporate suitable indigenous plants in critical areas and buffers, consistent with the site's habitat type and successional stage.
- EN-59.** Recognize and support the broad benefits and educational value of public access to critical areas and appropriate low-impact uses such as trails.
- EN-60.** Identify, prioritize and implement public projects to improve habitat.
- EN-61.** Pursue grants to support habitat improvement projects.
- EN-62.** Preserve and maintain the 100-year floodplain in a natural and undeveloped state, and restore conditions that have become degraded.
- EN-63.** Preserve and maintain fish and wildlife habitat conservation areas and wetlands in a natural state and restore similar areas that have become degraded.



- EN-64.** Manage aquatic habitats, including shoreline and riparian (streamside) habitats, to preserve and enhance their natural functions of providing fish and wildlife habitat and protecting water quality.
- EN-65.** Stabilize stream banks and shorelines if necessary by using bioengineering techniques except where hydrology, excessive cost, or other factors make this approach infeasible.
- EN-66.** Give special consideration to conservation or protection measures necessary to preserve or enhance anadromous salmonids, recognizing that requirements will vary depending on the aquatic resources involved, including differing stream classification, and that additional efforts may be identified in the regional salmon recovery planning process.
- EN-67.** Prohibit creating new fish passage barriers and remove existing artificial fish passage barriers in accordance with applicable state law.
- EN-68.** Require and provide incentives for the opening of piped stream segments during redevelopment where scientific analysis demonstrates that substantial habitat function can be restored, and where the cost of restoration is not disproportionate to the community and environmental benefit.
- EN-69.** Preserve and enhance native vegetation in Critical Area buffers and integrate suitable native plants in urban landscape development.
- EN-70.** Improve wildlife habitat especially in patches and linkages by enhancing vegetation composition and structure, and incorporating indigenous plant species compatible with the site.
- EN-71.** Preserve a proportion of the significant trees throughout the city in order to sustain fish and wildlife habitat.

- EN-72.** Encourage residents and professional landscaping firms to utilize native plants in residential and commercial landscapes.
- EN-73.** Promote urban backyard wildlife habitat programs, and support “certification” of community and private backyard wildlife habitats.
- EN-74.** Develop and support additional habitat enhancement demonstration projects.
- EN-75.** Protect wildlife corridors to minimize habitat fragmentation, especially along existing linkages and in patches of native habitat.
- EN-76.** Develop programs and regulations acknowledging that designated critical areas such as wetlands, shorelines, riparian corridors, floodplains, and steep slopes provide multiple functions including fish and wildlife habitat.
- EN-77.** Utilize studies and management recommendations to protect important wildlife habitat characteristics on land that is not a designated critical area.
- EN-78.** Manage fish and wildlife habitat conservation areas to protect overall habitat functions and values (food, water, cover, space), except where a “special status species” requires targeted habitat management.
- EN-79.** Rely on federal, state, and county agencies to identify “special status” wildlife species, but allow for a process to identify species of local importance to Bellevue.
- EN-80.** Manage naturally occurring ponds to provide fish and wildlife habitat, promote good water quality, and control invasive aquatic plants.



Critical Areas

- EN-81.** Use the best scientific information available in an adaptive management approach to preserve or enhance the functions and values of critical areas through regulations, programs, and incentives.



- EN-82.** Use prescriptive development regulations for critical areas based on the type of critical area and the functions to be protected; and as an alternative to the prescriptive regulations, allow for a site specific or programmatic critical areas study to provide a science-based approach to development that will achieve an equal or better result for the critical area functions.
- EN-83.** Recognize critical area function in preparing programs and land use regulations to protect critical areas and to mitigate the lost function due to unavoidable impacts.
- EN-84.** Use science based mitigation for unavoidable adverse impacts to critical areas to protect overall critical areas function in the watershed.
- EN-85.** Implement monitoring and adaptive management plans for critical areas mitigation projects to ensure that the intended functions are maintained or enhanced over time.
- EN-86.** Facilitate the transfer of development potential away from critical areas and the clustering of development on the least sensitive portion of a site.
- EN-87.** Reduce or eliminate regulatory barriers to protecting and enhancing critical areas.
- EN-88.** Develop partnerships with land conservation organizations to acquire critical areas and buffers to protect and restore critical areas functions.
- EN-89.** Explore opportunities for public acquisition and management of key critical areas of valuable natural and aesthetic resources, and fish and wildlife habitat sensitive to urbanization through a variety of land acquisition tools such as conservation easements and fee-simple purchase.
- EN-90.** Prioritize efforts to preserve or enhance fish and wildlife habitat through regulations and public investments in critical areas with largely intact functions and in degraded areas where there is a significant potential for restoring functions.

- EN-91.** Allow for building footprint expansion options for existing single family structures in critical areas, protective buffers, and setbacks only in a manner that does not degrade critical area functions.
- EN-92.** Require mitigation proportional to any adverse environmental impacts from development or redevelopment in the Protection Zone.

Noise

- EN-93.** Ensure that excessive noise does not impair the permitted land use activities in residential, commercial, and industrial land use districts.
- EN-94.** Protect residential neighborhoods from noise levels that interfere with sleep and repose through development standards and code enforcement.
- EN-95.** Require a noise analysis for transportation projects in or near residential areas if existing or projected noise levels exceed city-adopted standards, and implement reasonable and effective noise mitigation measures when appropriate.
- EN-96.** Work with the state to mitigate freeway noise, while addressing aesthetic concerns.
- EN-97.** Require new residential development to include transportation noise abatement design and materials where necessary, including the preservation of vegetation, to minimize noise impacts from arterials and freeways.
- EN-98.** Evaluate the benefit of measures designed to mitigate arterial noise, particularly noise walls, along with impacts on the pedestrian environment and neighborhood character.
- EN-99.** Consider noise impacts when evaluating measures designed to keep traffic volumes and speeds within reasonable limits on collector arterials.



POLICY CONNECTIONS



The Environment Element sets policies to ensure that the natural beauty and environmental resources of Bellevue are preserved for future generations. Other elements of the Comprehensive Plan include policies that address resource conservation, protection, and enhancement.

Policies to protect ground and surface water resources and the reduction of household waste can be found in the **Utilities** Element.

The **Capital Facilities** and **Neighborhoods** Elements address emergency preparedness for natural hazards.

The **Transportation** Element contains a set of policies on environmental considerations for the development of transportation facilities.

Policies about the stewardship of city-managed open spaces are in the **Parks, Recreation and Open Space** Element.

IMPLEMENTATION

Bellevue implements the Comprehensive Plan through numerous actions, including day-to-day operations, capital investments, strategic partnerships, and review of new development projects. The city’s environmental strategy is implemented through a variety of plans and programs, some conducted in partnership with other agencies or with community groups. The following list shows some of the relevant plans that implement the Environment Element.

Implementation	Type
<p><u>Water Comprehensive Plan</u></p> <p>This plan establishes policies and supports the development and on-going work of programs that support resource conservation and protection.</p>	<p>Functional Plan: updated on a six year cycle.</p>
<p><u>Wastewater System Plan</u></p> <p>This plan establishes policies and supports watershed restoration efforts.</p>	<p>Functional Plan: updated on a seven year cycle.</p>
<p><u>Storm and Surface Water System Plan</u></p> <p>This plan establishes the city’s storm and surface water policy including resource conservation and protection.</p>	<p>Functional Plan: updated on a seven year cycle.</p>
<p><u>Parks and Open Space System Plan</u></p> <p>This plan is the primary tool to guide the long-term growth and development of Bellevue’s parks and open space system. It includes policies that support resource management as well as several programs that encourage environmental stewardship and awareness.</p>	<p>Functional Plan: updated on a six year cycle.</p>
<p><u>King County Solid Waste Management Plan</u></p> <p>This county plan sets policies for the management of waste streams over a 20 year time period.</p>	<p>Functional Plan: updated on a six year cycle.</p>
<p><u>Environmental Stewardship Program</u></p> <p>The ultimate goal of the Environmental Stewardship Initiative is to create a sustain-able 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.</p>	<p>Program: On-going.</p>
<p>Solid Waste & Recycling Conservation Program</p> <p>The Utilities Department engages in this program to promote conservation, waste reduction and resource management.</p>	<p>Program: On-going.</p>
<p>Community Partnerships</p> <p>Form and maintain partnerships that help Bellevue to meet local and regional environmental goals with community agencies such as King County, Puget Sound Energy, and the Cascade Water Alliance.</p>	<p>Partnerships: On-going.</p>
<p>Development Review</p> <p>Development review ensures that regulations, standards and policies for the protection, conservation, and enhancement of the environment are met during the design of new development.</p>	<p>Project review: On-going.</p>

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