

1.5°

A PATH TO REDUCING OUR CARBON FOOTPRINT

2019 CLIMATE ACTION PLAN

Beaverton OREGON

1.5°C

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INTRODUCTION



Climate change is one of the greatest environmental challenges of our time. As a global issue, the response to climate change has typically been the responsibility of national and corporate policy. The largest impacts in reducing emissions, however, are at the local level. Cities contribute more than 70 percent of global carbon emissions[1] and are in a prime position to make both immediate and lasting change. Local actions, in collaboration with cities around the globe, will significantly slow the pace and impact of climate change.

In Oregon, climate change is being felt in warmer air and water temperatures. This leads to more flooding as rain falls rather than snow, as well as increased summer droughts and wildfire due to the lack of summer snow melt. These conditions will intensify as more greenhouse gases (GHG) are released.

The City of Beaverton made its initial commitment to addressing climate change by signing the U.S. Conference of Mayor's Climate Protection Agreement in 2008, joined the Climate Mayors coalition in 2014 and reaffirmed commitment to climate protection in 2017 by becoming a signatory of the *We Are Still In* movement.

Our **commitment** is to limit temperature increases to ONE point FIVE DEGREES CELSIUS. This means ZERO EMISSIONS by 2050.

PLAN DEVELOPMENT AND FRAMEWORK

The Beaverton Climate Action Plan (BCAP) presents a framework for action to reduce emissions from our community and to safeguard Beaverton from the effects of higher temperatures, increasing wildfire and smoke, worsening storms and increased flooding.

The plan was informed by community feedback from the extensive engagement process that led to the Beaverton Community Vision Plan. Built upon that strong foundation, the BCAP presents a framework for reducing GHG emissions (mitigation) and responding to a changing climate (adaptation) through strategies and actions outlined in five key framework categories.

Framework Category	Description	Key Actions
Consumption and materials management	Consumer choices to reduce environmental impact	Reducing consumption Sharing goods and tools Reducing wasting of food Lower carbon goods and services
Building energy and urban form	Efficient and low carbon energy today, compact and complete neighborhoods tomorrow	Energy efficiency Low carbon power Smaller homes Compact and dense development
Transportation	Better modes and fuels today, efficient transportation systems for tomorrow	Active, mass transit, and personal vehicles Electric vehicles Transit friendly neighborhoods Alternatives to vehicles
Natural systems	Green spaces and water	Adapted future tree canopy for cooling of buildings, spaces and people Planning for flooding, landslides, and wildfire
Community wellbeing	Livability, health and safety	Acute – warming, cooling and centers with filtration for wildfire smoke Chronic – preparing for population growth; disease pattern shifts and mental health stressors

The framework categories and actions are the result of a planning effort with more than a dozen community partner organizations, city staff and guidance from consultants. An annual progress report will be prepared and the plan updated at least every five years.

ACKNOWLEDGMENTS

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Energy Trust of Oregon
Enhabit
ICLEI-Local Governments for Sustainability USA (ICLEI)
Metro
NW Natural
Oregon Department of Energy (ODOE)
Oregon Department of Environmental Quality (ODEQ)
Oregon Department of Transportation (ODOT)
Oregon Food Bank
Partners for a Sustainable Washington County Community
Portland General Electric (PGE)
TriMet
Tualatin Hills Park & Recreation District (THPRD)
Tualatin Valley Fire & Rescue (TVF&R)
Urban Sustainability Directors Network (USDN)
Washington County
Waste Management
Westside Transportation Alliance

ADOPTION

The Beaverton Climate Action Plan was adopted by the Beaverton City Council on November 12, 2019. Agenda Bill #19274, Resolution #4610.

1 WHY BEAVERTON MUST DEVELOP & IMPLEMENT A CLIMATE ACTION PLAN

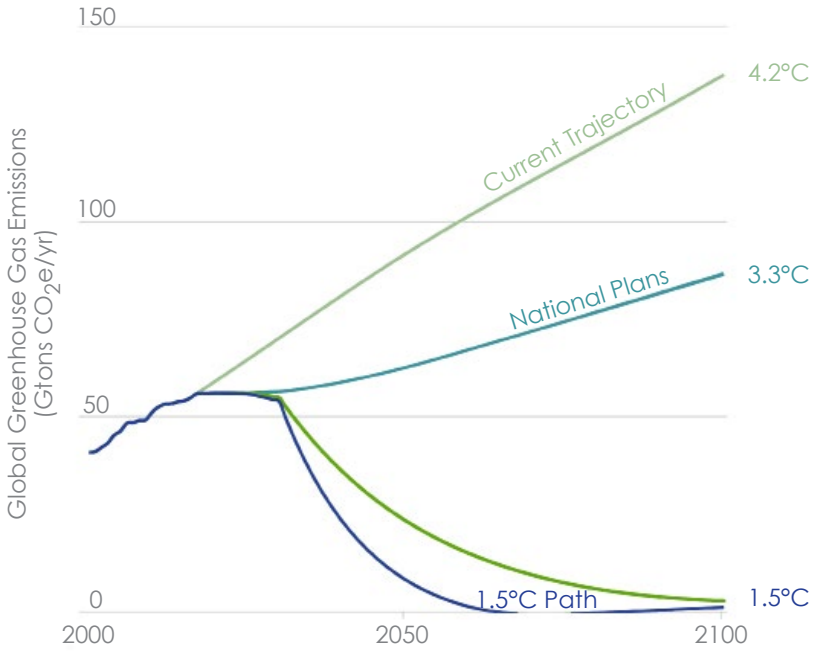


FIGURE 1
Global greenhouse gas emissions projected through the year 2100. Current trajectory indicates the projected global temperature increase at the current rate of change. National plans indicates the projected global temperature increase if current planning efforts are implemented. 1.5C path indicates the objective of the Paris Climate Accord.[2]

CLIMATE SCIENCE

The National Aeronautics and Space Administration (NASA) explains climate change as a long-term change in weather patterns.[3] NASA, as well as other internationally recognized scientific agencies such as the Intergovernmental Panel on Climate Change have researched millions of data points confirming that use of fossil fuels adds carbon dioxide (CO2) and other heat-trapping GHGs into the atmosphere and is warming the earth beyond natural cycles.[3]

In December 2015, 194 nation states and the European Union reached agreement on what is commonly known as the Paris Climate Accord. This international agreement aims to strengthen the global response to the threat of climate change by pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels.

To hold the global temperature increase to 1.5°C, atmospheric concentrations of GHGs will have to be held to 450 parts-per-million (ppm).[4] As of November 2018, CO2 concentrations were 408 ppm. Keeping these concentrations from rising requires widespread global action to dramatically reduce the rate of emissions.[5]

At the current rate, global average temperatures will increase by at least 4°C (7.2°F) by the year 2100. This temperature has not been present on earth for 30-40 million years.[6] The increase in temperature will trigger more extreme weather events, sea level rise, higher temperatures and altered rain patterns, which will lead to the displacement of hundreds of millions of people (climate migration).



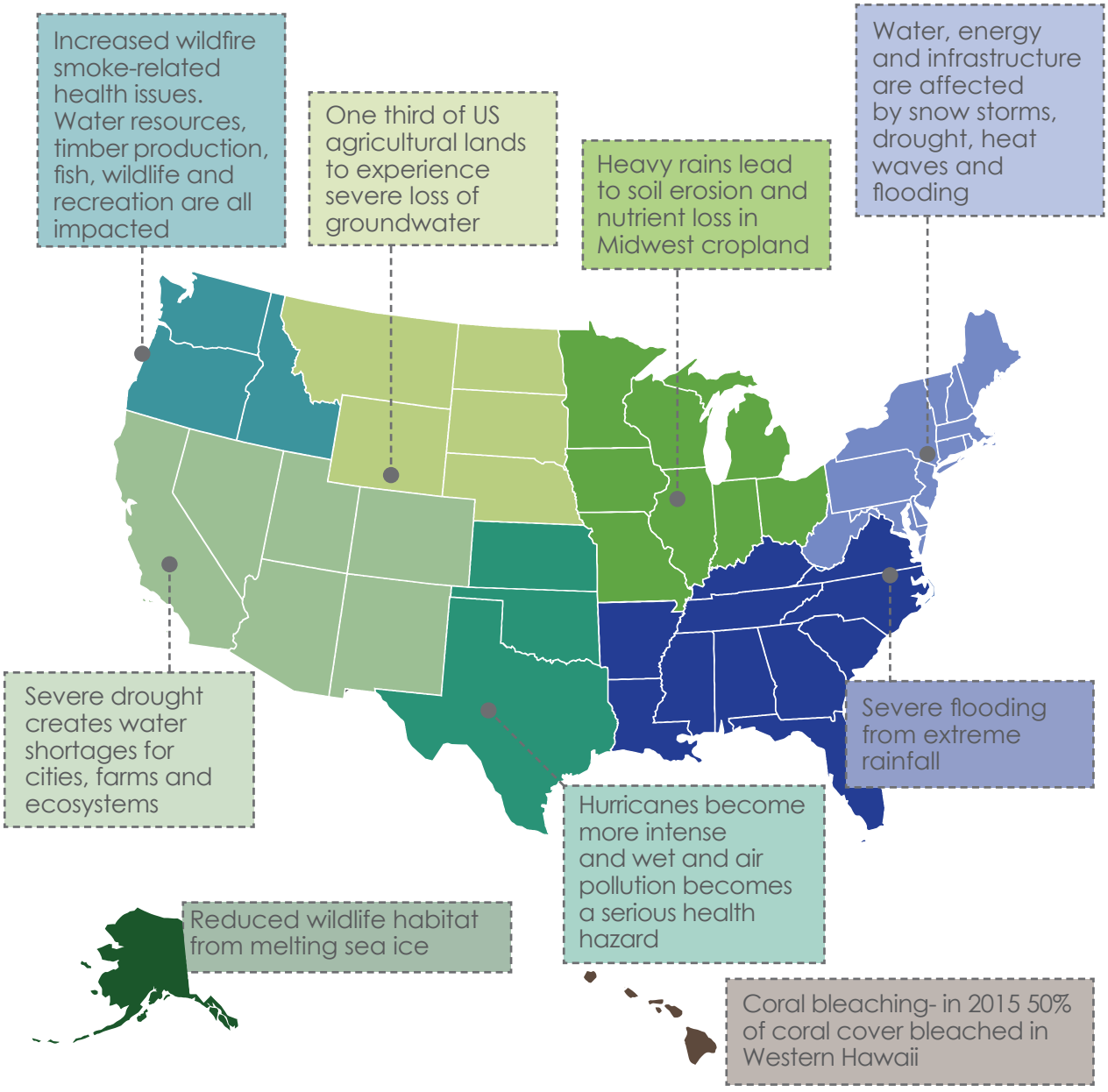
> We will adopt, honor, and uphold the commitments to the goals enshrined in the Paris Agreement. We will intensify efforts to meet each of our cities' current climate goals, push for new action to meet the 1.5°C target, and work together to create a 21st century.
>
> The world cannot wait — and neither will we.

Mayors' Climate Protection Center
The Mayors' Climate Protection Agreement currently has 1,060 signatories

CLIMATE ACTION IN THE UNITED STATES

The United States signed on to the Paris Climate Accord in 2015 and committed the nation to climate action. In June 2017, however, the federal government announced that the U.S. will withdraw from the Paris Climate Accord, effective November 2020.

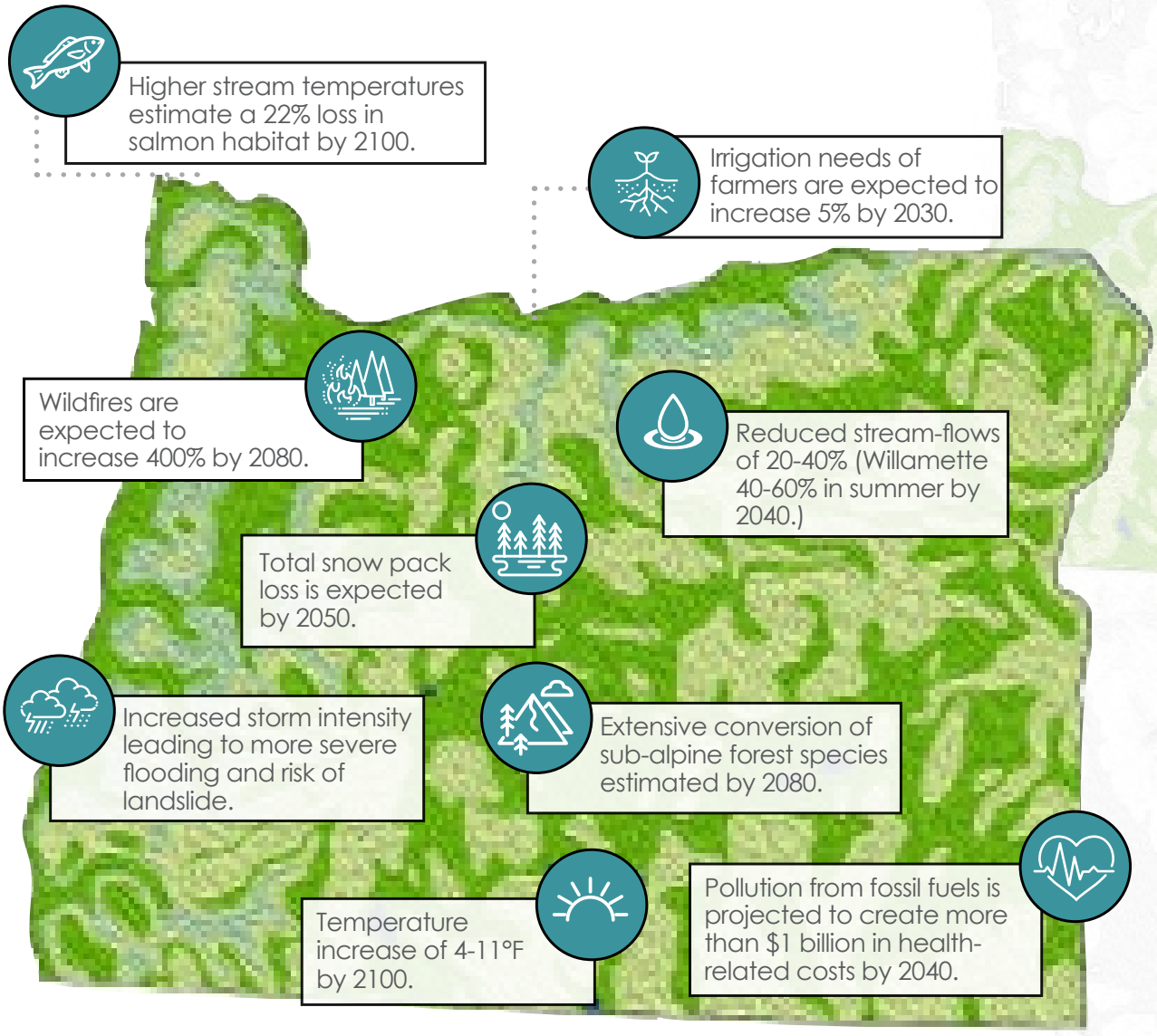
In response, mayors and business leaders from around the U.S. began signing the *We Are Still In* declaration and reaffirmed commitment to climate action. As of fall 2019, 3,807 municipal, state, education and business leaders representing 155 million people across all 50 states have signed on to the *We Are Still In* coalition, including the City of Beaverton.



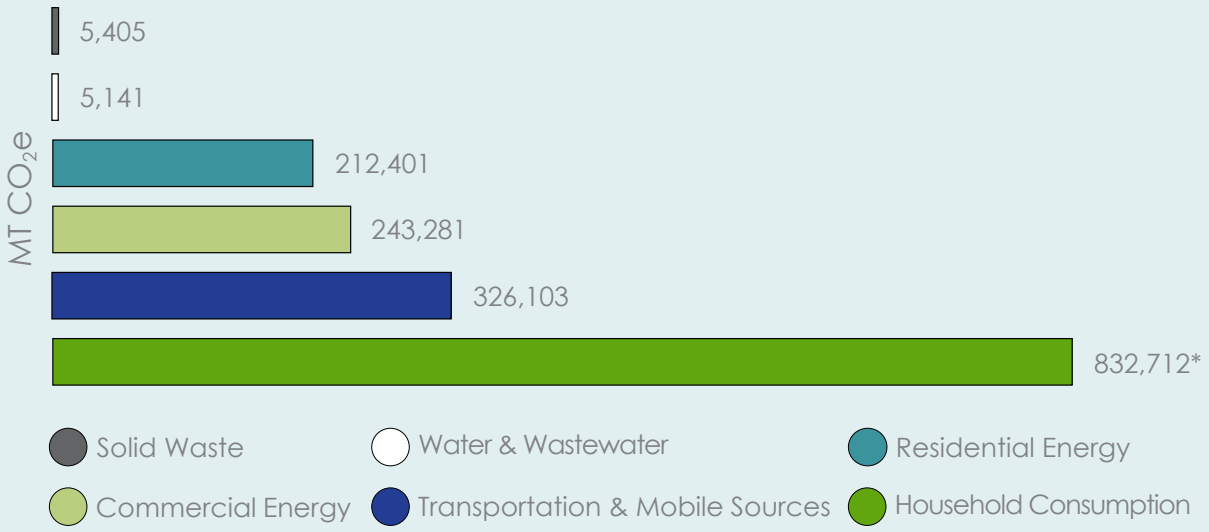
Potential climate impacts in various regions of the United States projected in the fourth National Climate Assessment.[7, 8]

CLIMATE IMPACT IN OREGON AND BEAVERTON

The City of Beaverton and the Lower Willamette River Basin will experience specific climate impacts unique to our area. Among the impacts forecast by climate scientists are those depicted below.[7, 8]



BEAVERTON'S CARBON EMISSIONS: COMMUNITY-WIDE TOTAL



**Household consumption not included in GHG inventory. Household consumption above is estimated with 2013 and 2017 data.*

BEAVERTON'S CARBON FOOTPRINT

The City of Beaverton began reducing GHG emission in city operations in 2014, with the adoption of the Sustainable Beaverton Strategy. The BCAP broadens this effort to the whole community.

Developing a plan for climate action began with a GHG inventory to identify the sources of all emissions. Once a baseline is identified, goals can be established to reduce emissions. There are two types of these GHG inventories: consumption-based and sector based.

Consumption-based inventories include emissions generated outside of the community to produce the goods and services used by that community. Many of these goods and services are generated in other parts of the world and imported into the local community.

Consumption inventories provide important information but are challenging to measure since the farms, factories and transportation systems to generate these items are located all around the world. Regional data and Beaverton's 2013 and 2017 inventories show that about 51 percent of our emissions come from these goods and services imported from outside Beaverton.

Sector-based inventories provide information about locally generated emissions from the energy used in homes, transportation, waste disposal, water and similar goods and services. Because sector-based emissions are local, there is greater ownership and control over the emissions and a higher confidence level in the data.

Transportation is the largest contributor to our sector-based emissions (20 percent), followed by commercial energy (15 percent), and residential energy (13 percent).

According to Beaverton's sector-based inventories from 2013 and 2017, community-wide emissions increased by 2.3 percent.

2 CLIMATE EQUITY



City practices reflect the needs of our diverse community. Programs, services and decision-making processes are accessible to and incorporate members of all of Beaverton's diverse communities.

- City of Beaverton 2014 Diversity Equity and Inclusion Plan

Diversity, equity and inclusion are core values in the planning, implementation, and evaluation of programs and projects in the city. Departments link strategies to metrics and measure progress in this area.

THE IMPORTANCE OF EQUITY IN A CHANGING WORLD

The impacts of climate change will fall disproportionately on low-income populations and people of color. Historically, urban design legislation, housing policy, and gentrification have forced members of our community into areas more susceptible to extreme weather events. This has resulted in a lack of access to healthy and efficient housing, public transit and neighborhoods with safe walking routes.

Additionally, these populations have been systematically underserved from government programs and not fully represented in the creation of climate policy. Transportation options, housing, and access to nutritious food and healthcare are some of the disparities that have affected these members of our community.

Beaverton is proudly home to a diverse community and is actively engaged in advancing equity in all areas of community and civic life. Since 2014, when the city published a Diversity, Equity and Inclusion Plan that serves as a guiding document to use a racial equity lens for programs and policies and to counteract long-standing policies and processes that harmed communities of color. Marginalized communities will continue to be engaged in decision-making and the city will continue to focus on minimizing barriers to housing experienced by communities of color as well as providing culturally specific resources and services.

CONSUMPTION AND MATERIALS MANAGEMENT

While garbage and recycling service is available to all residents and businesses within Beaverton, access to educational materials and tools can be a barrier to participation. The city's Solid Waste and Recycling Program strives to translate many resources into Spanish, including recycling fliers, brochures, posters, bags, community garden program materials and Eat Smart, Waste Less Challenge materials. Translation services are available and have been used to ensure accessibility to immigrants, refugees and English language learners to the community garden orientation. The city will prioritize providing low income and communities of color with education and resources to promote the reduction, reuse, repair and salvage of materials.

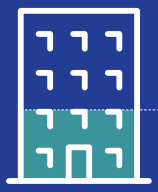
BUILDINGS, ENERGY AND URBAN FORM

For lower-income homeowners, energy efficiency upgrades and property weatherization can be prohibitively expensive. Fortunately, there are income qualified services available through Community Action and Energy Trust of Oregon. Energy Trust also offers cash incentives to multifamily property owners for the installation of qualified energy efficient equipment that can help lower energy bills, reduce operating costs and provide education to renters. The City of Beaverton will implement a pilot program in 2019 to provide assistance to weatherize low-income housing.

While developing and redeveloping neighborhoods, a mix of affordable housing should be included to ensure that compact and complete neighborhoods are accessible to all income levels and are transit-accessible. In December 2016, strategies were developed to preserve currently unregulated affordable housing in Beaverton and opportunities were identified for developing new affordable housing to prevent displacement due to high costs of living. In 2017, the city released a Housing Five Year Action Plan to help ensure a variety of housing offerings in the city. Further redevelopment of infrastructure will focus on weather prone areas to ensure resiliency for the neighborhoods that are most likely to be affected.

High-income black applicants are 86% more likely and latino applicants are 125% more likely to have their home loan application denied compared to high income white potential home owners.

ACCESS TO HOUSING & FOOD IN WASHINGTON COUNTY[9,10]



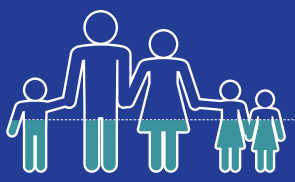
41.7%
Of people of color live in cost-burdened households (spending 35% or more of their income on rent).

39%
Of students qualify for free and reduced price meals at school





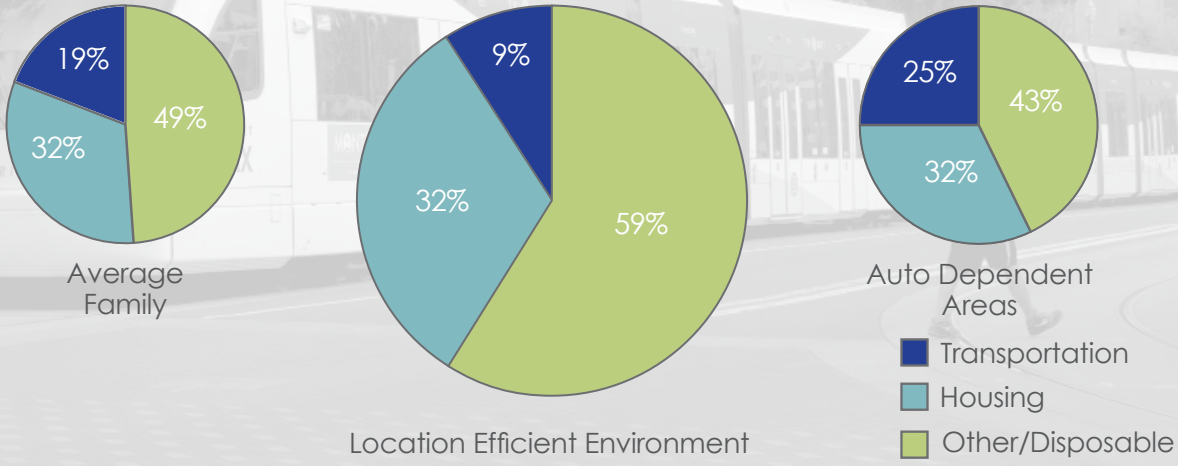
ALMOST 1 IN 4
Residents identify as a person in color, yet...



More than **36%**
Of the county's people in poverty are people of color

County Population: 572,071

THE COST OF TRANSPORTATION



TRANSPORTATION

Neighborhoods in the U.S. are often segregated due to the legacy of former federal housing policies. Providing affordable housing in areas served by transit, sidewalks and bikeways reduces greenhouse gas emissions. Transit systems and multi-modal communities must meet the needs of families, immigrant communities, an aging population, disabled people and low-income residents. An underdeveloped transit system, however, can often lead to safety and "last mile" challenges – meaning that it is inconvenient and/or time consuming to complete the whole trip via transit.

Households in low-income areas typically own fewer vehicles, have longer commute times and higher transport costs. These populations also often rely on public transportation to access shopping and places of employment, yet lack of access and cost of ridership can create barriers. It is important to ensure that lower-income residents do not bear the burden of higher transport costs as policies such as emission charges are contemplated to address climate changes.

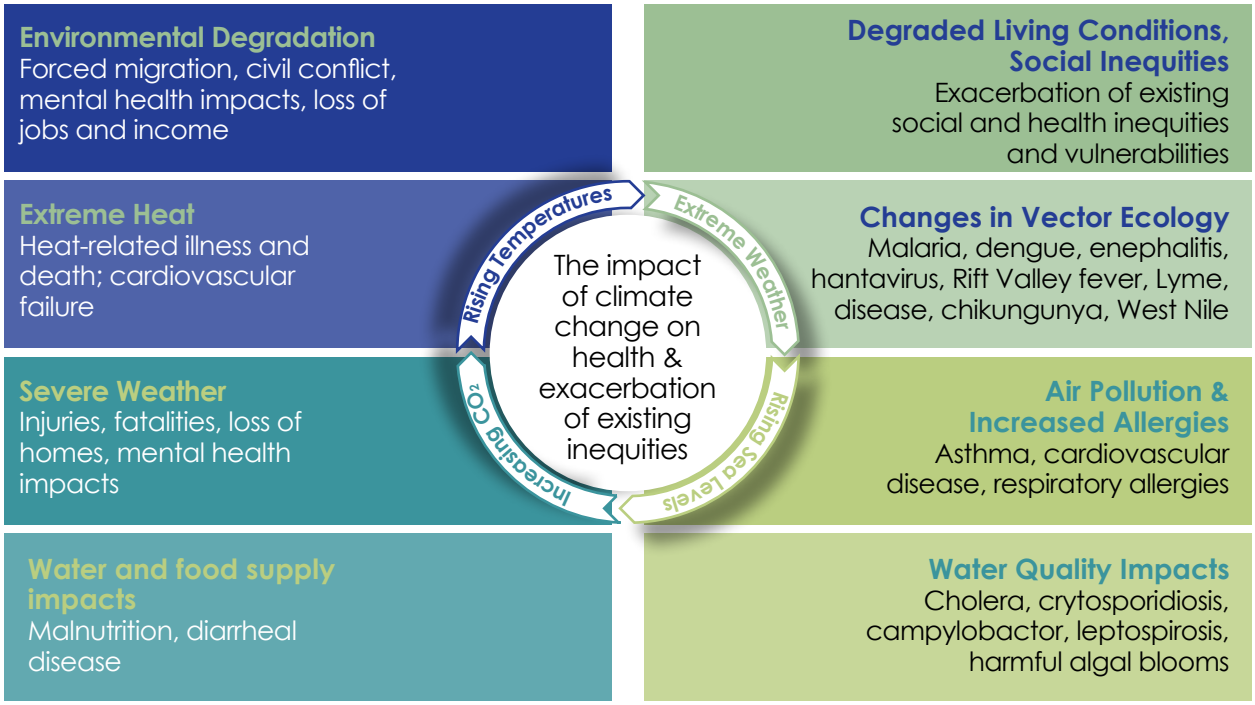
The City of Beaverton's Transportation Division is working on innovative solutions for the "last mile" including bike and scooter hire as well as autonomous bus transfers for large employers.

NATURAL SYSTEMS

Natural areas are subject to the same legacy issues as other parts of the urban form. Lower-income populations and communities of color may be disproportionately exposed to the hazards of the natural world as their housing may be in less desirable locations such as low-elevation neighborhoods or further from public transit and greenspaces.

Greenspaces and waterways not only provide storm water mitigation but also necessary relief from heat waves. To maintain those features, deliberate planning will need to occur to ensure that during drought and heat waves, shade trees survive conditions and continue to provide cool shade and reduce water evaporation from waterbodies. Additionally, strategies around tree planting should address inequities such as heat island effect.

Green spaces in the city reduce heat island effects, mitigate storm water and contribute to people's physical and mental health and wellbeing by providing places to socialize, play, exercise and relax.



While many of the climate effects may not happen in Beaverton, those affected are more likely to migrate to the north, where living conditions will be milder.

COMMUNITY WELLBEING

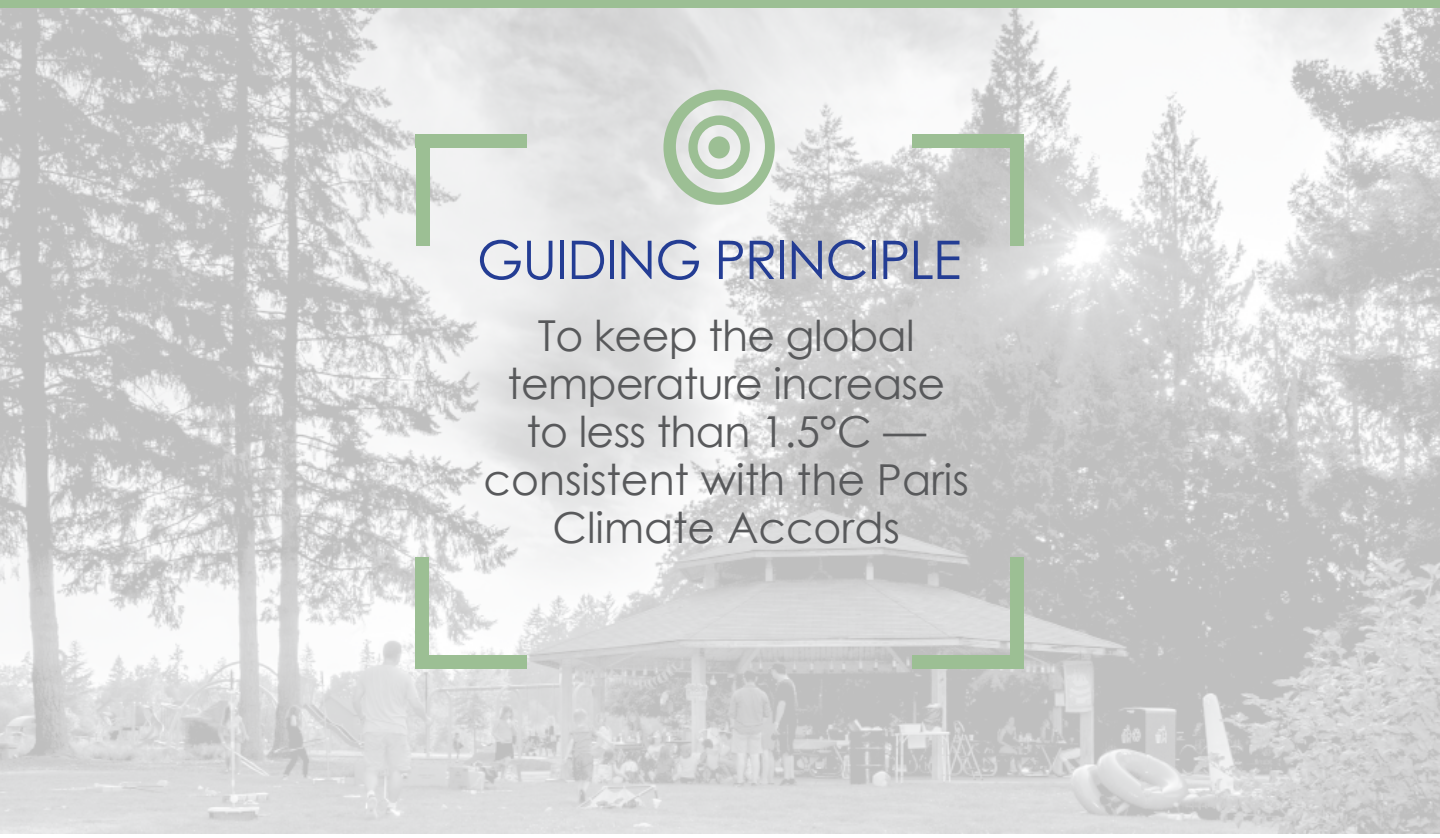
Just as lower-income families and communities of color are more likely to be exposed to risks of extreme weather, they are also more likely to be exposed to health challenges given their limited access to health care. Climate change related health impacts can include heat related illness, increased instances of cardiovascular and respiratory disease resulting from air pollution (including mortality, increased occurrence of vector- and water-borne diseases), increased injury and loss of life due to severe storms and flooding, and stress and mental trauma resulting from loss of livelihood, property loss and displacement.

Climate change will likely increase the number of these events that cause trauma to an individual which can leave them feeling vulnerable and helpless. Washington County's Health and Human Services department has developed a trauma-informed care framework that integrates trauma awareness into policies, procedures and standard practices. Trauma-informed care recognizes the impact trauma can have on an individual's ability to access services, and trains practitioners on how to offer trauma-informed support. Washington County also has programs looking at shifts in communicable diseases, mosquito control and respiratory health. The City of Beaverton supported the launch of the LISTOS (Spanish for "Ready") in Washington County, which is a culturally-adapted disaster preparedness curriculum for Spanish speakers, now taught across the county and once a year in Beaverton.

3 HOW TO NAVIGATE THIS REPORT

WHERE ARE WE GOING?

The City of Beaverton started taking steps to reduce GHG emission in 2014 with the adoption of the *Sustainable Beaverton Strategy*. The Beaverton Climate Action Plan broadens this work to the whole community.



GUIDING PRINCIPLE

To keep the global temperature increase to less than 1.5°C — consistent with the Paris Climate Accords

Community Target

100% reduction of greenhouse gas emissions by 2050 (from 2013 baseline year), which is an average reduction of at least 3% annually

City Operations Target

50% fossil fuel reduction from 2009 baseline, and carbon neutral by 2030

KEY STRATEGIES

A Prepare for climate impacts in the community and on city services and operations, including increased population due to climate migration and displacement

B Ensure that equity is prioritized to address the needs of low-income populations and people of color

C Educate city staff, volunteers and the community about local climate impacts and mitigation and adaption efforts

D Support local, regional, state, national and international climate policy and actions, including placing a price on carbon

READING THIS PLAN

Beaverton's Climate Action Plan includes 86 actions that are intended to reduce greenhouse gas emissions that cause climate change and/or reduce the impact of changes that are already happening. These pages explain the terms and icons found in the five framework chapters on the following pages.

The GHG mitigation potential for actions in this plan were calculated to show the scale of maximum annual emissions relative to Beaverton's baseline GHG emissions. Many of the actions will take several years, or even decades, to reach the projected maximum potential.

EXAMPLE 1

Energy Trust of Oregon estimated the energy efficiency potential for the years 2014-2034, so the mitigation potential represents Beaverton's energy efficiency potential in 2034.

In some cases, the mitigation potential represents the emissions reduction associated with a strategy or series of actions rather than a single action as written.

EXAMPLE 2

Action #25 is focused on increasing the adoption rate of energy efficiency measures. The mitigation potential and cost effectiveness for this action represent the potential for energy efficiency in the community, not just the benefits associated with the specific action as written.

In many cases there may be significant overlap of mitigation potential for several individual actions and therefore these actions is not always cumulative.

EXAMPLE 3

The cost effectiveness data for Action #25 is stated as part of that action, but a portion of that data will also be represented in the estimate for development of a Home Performance Rating system.

ABOUT THE PROJECTED COST EFFECTIVENESS RATINGS IN THIS PLAN:

The cost per metric ton of carbon dioxide equivalent reduced ($ / -1 MT CO2e) allows the reader to compare the cost effectiveness between very different types of actions in mitigating emissions. The cost and emissions values used to calculate cost effectiveness represent the cost and emissions difference between the baseline and alternative scenarios.

Baseline emissions typically represent existing conditions (Beaverton's baseline community GHG Inventory) and the alternative scenario represents the effects of a strategy or action being implemented. Costs include capital equipment, operations, maintenance, as well as the value of any avoided costs experienced by the community (e.g., energy costs, landfill tip fees, etc.). Emissions include (as much as data allows) the lifecycle GHG impacts of each action. Calculation of cost effectiveness is challenging and is subject to many variables; these are calculated to allow for improvements and revisions as related information is updated over time.

READING THE KEY

M Mitigation Action

A Adaptation Action

Promotes Health & Safety

= Improves Equitable Access

Mitigation Potential (Low to High)

Cost per ton CO_2e



Cost Saving

Investment Required

M Mitigation Action

Actions to reduce the amount and speed of future climate change by reducing carbon emissions in the atmosphere. These actions are indicated by solid shading in the "M" box.

A Adaptation Action

Actions aimed at minimizing the consequences of climate change; sometimes referred to as "resilience." These actions are indicated by solid shading in the "A" box.

Promotes Health & Safety

Shaded boxes with a heart are mitigation or adaptation actions with a health or safety co-benefit.

= Improves Equitable Access

Shaded boxes with an equal symbol are mitigation or adaptation actions with the co-benefit of improving equitable access.

Mitigation Potential



Mitigation potential has not been measured or is an adaptation action.



Reduces annual emissions by less than 1,000 metric tons or is a cumulative action.



Reduces annual emissions by 1,000 to 5,000 metric tons



Reduces annual emissions by 5,000 to 10,000 metric tons



Reduces annual emissions by more than 10,000 metric tons

Cost per ton CO_2e



Adaptation action; no significant emissions impact.



Estimated cost savings of more than $250 per metric ton of emissions



Estimated cost savings of $0 to $250 per metric ton of emissions



Estimated investment of $0 to $250 per metric ton of emissions



Estimated investment of more than $250 per metric ton of emissions

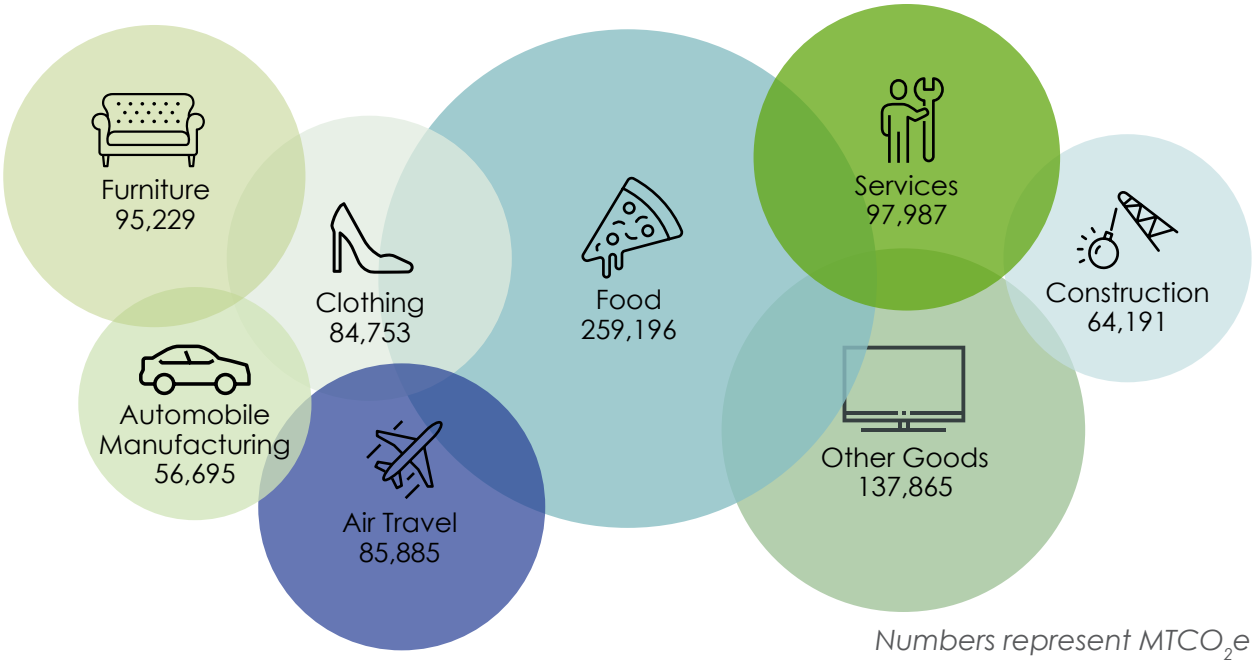
This symbol denotes a high impact action as identified by the City of Beaverton and/or the Urban Sustainability Directors Network (USDN). These items either have the potential to make the most impact in our community, or establish the foundation for other large impact actions.



CONSUMER CHOICE AND WASTE

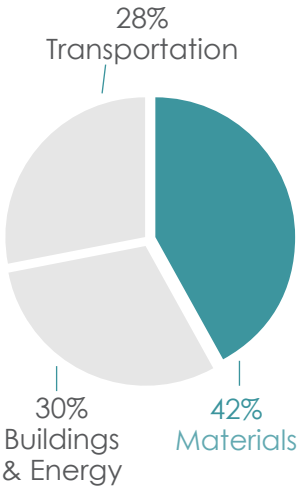
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BEAVERTON'S CARBON EMISSIONS: COMMUNITY-WIDE HOUSEHOLD CONSUMPTION



Numbers represent $MTCO_2e$

CONSUMER CHOICE AND WASTE



Beaverton's greenhouse gas inventories report that about 42 percent of emissions are the result of the goods and services consumed as a community. This includes the food, clothes, furniture, and vehicles that individuals purchase as well as services like construction or landscaping. Combined, these are categorized as "household consumption."

The carbon footprint of consumption by the average U.S. resident is about 2.5 times greater than anyone else on the planet.[11] The choices consumers make are important in reducing overall emissions. One way to approach this is to focus on buying what is needed, rather than what is wanted. The impact of buying "less stuff" and/or buying goods that are durable, repairable, or made with recycled content would have a significant impact on reducing emissions.

One of the largest sub-categories of consumption is food production. This represents about 15 percent of our community's total carbon footprint. As a result, food represents a significant opportunity for climate action. Emissions can be reduced by creating mechanisms that utilize all food grown (identifying outlets for "ugly" produce, donating surplus, etc.), and eating less meat and more vegetables, fruits and grains.[12] Avoiding wasting food at home through meal planning and proper storage as well as composting left overs are all important actions.

WHAT'S ALREADY HAPPENING



Eat Smart, Waste Less Challenge

Forty percent of all food is wasted in the US and in Oregon. Eat Smart, Waste Less provides tools to educate households on food storage, preparation, and how to shop to waste less food, resulting in both cost savings and emissions reductions. The program is available to all community members. Learn more at eatsmartwasteless.com.



Edible food recovery

One in seven people face food insecurity. The Oregon Food Bank's Fresh Alliance program rescues edible food from food manufacturers and grocery stores and distributes this food to local pantries, including many in Beaverton. In 2018, Fresh Alliance partners donated more than 18 million pounds of food statewide, providing more than 15 million meals.



Curbside recycling and composting

Beaverton residents have access to curbside recycling as part of their garbage service; and businesses are required to recycle paper, metal and plastic bottles and tubs. Commercial composting is available to food service businesses with nearly 150 businesses utilizing this service. Residential curbside composting is available at single-family homes with yard debris service. The net effect of integrating compost into the soil results in increased sequestration of carbon dioxide and less methane from landfill.



Library of Things

Beaverton City Library has a Library of Things that allows patrons to borrow rather than buy new games, kitchenware, electronics, musical instruments, sports equipment, craft, traditional tools, and toys. In the past year, there were over 3,000 check outs from both Beaverton locations. Learn more at BeavertonLibrary.org.



Repair Fairs

Since 2015, Beaverton has hosted 12 Repair Fairs, receiving over 500 items for repair ranging from torn jeans to broken electric wheelchairs. These events help build a culture of repair and reuse by bringing together skilled volunteers willing to share their knowledge with fellow community members. Meeting new people, learning useful skills and keeping usable items out of the landfill – good things can happen at a Repair Fair. Learn more at RepairFair.org.

ACTION	EFFECT	KEY AGENCIES
SHARED ECONOMY		
1: Implement education programs aimed at reducing consumption of carbon intensive materials		- City/Mayors - DEQ - Metro
2: Increase access to community sharing programs		- City/Library - WCCLS
3: Increase access to product repair in the community		- City/Mayors - City/Library - WCCLS
4: Increase opportunities for material reuse, focusing on high impact items		- City/Mayors
FOOD SYSTEMS		
5: Expand participation in residential food scraps collection programs		- City/Mayors - Refuse haulers
6: Reduce residential and business wasted food		- City/Mayors - Metro
7: Increase business participation in food donation and food scraps collection program		- City/Mayors - Refuse haulers
8: Increase recovery of recyclable materials		- City/Mayors
RECYCLING		
9: Prioritize recovery programs with high environmental impact (food, plastic, carpet)		- City/Mayors - DEQ - Metro
10: Decrease contamination in residential and commercial recycling		- City/Mayors - Refuse haulers - Metro

KEY

M Mitigation Action

A Adaptation Action

Promotes Health & Safety

= Improves Equitable Access

Mitigation Potential (Low to High)

Cost per ton CO_2e

Cost Saving — Neutral — Investment Required

ACTION	EFFECT	KEY AGENCIES
DEBRIS MANAGEMENT		
11: Plan for management of hazardous materials during extreme weather		- City/Mayors - Metro
12: Work with partner agencies to update disaster debris plan		- City/Mayors - Metro - Washington County
13: Develop a deconstruction and salvage policy		- City/Mayors - Refuse haulers - Metro
POLICY DEVELOPMENT		
14: Develop model sustainable procurement policies for businesses and agencies		- City/Finance - City/Mayors
15: Support state and federal legislation for product environmental labeling		- City/Mayors - Metro - DEQ
16: Support local, state and federal product stewardship legislation		- City/Mayors - AOR - Metro - DEQ
17: Develop policies to reduce single-use plastics		- City/Mayors

KEY

M Mitigation Action

A Adaptation Action

Promotes Health & Safety

= Improves Equitable Access

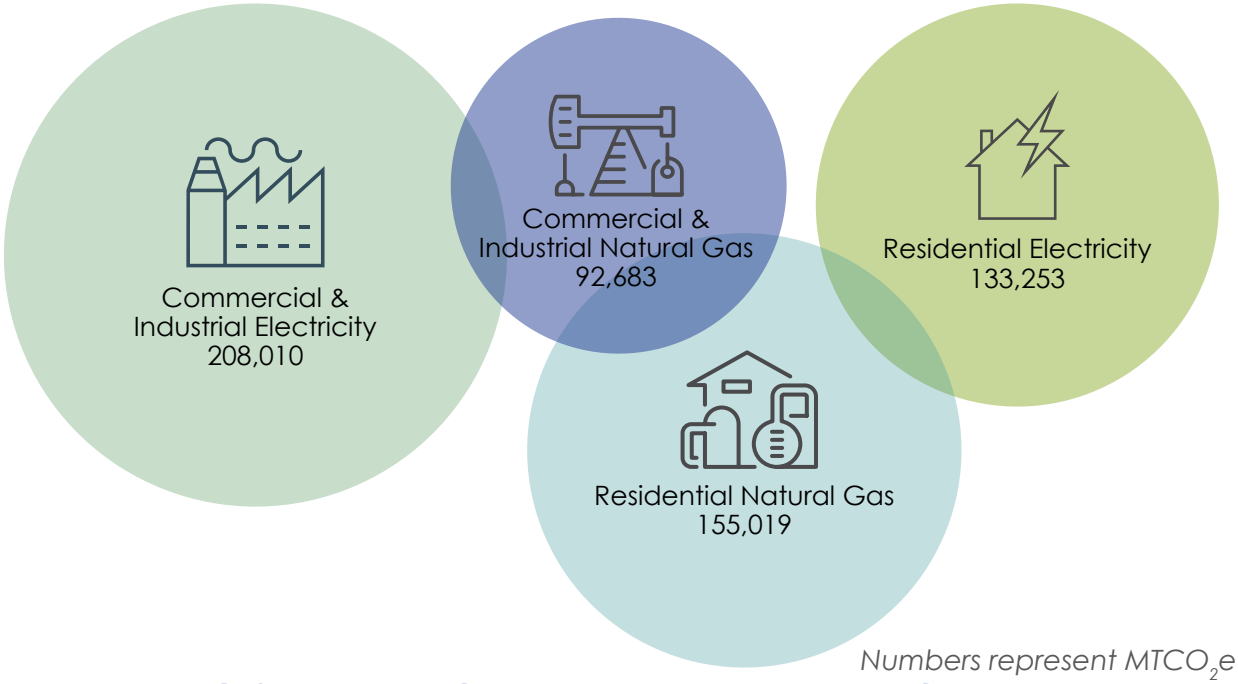
Mitigation Potential (Low to High)

Cost per ton CO_2e

Cost Saving — Neutral — Investment Required

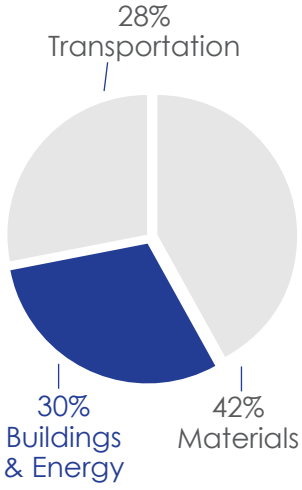
5 BUILDINGS, ENERGY AND URBAN FORM

BEAVERTON'S CARBON EMISSIONS: COMMUNITY-WIDE BUILDINGS AND ENERGY



Numbers represent $MTCO_2e$

BUILDINGS, ENERGY AND URBAN FORM



Residential and commercial energy account for approximately 30 percent of Beaverton's GHG emissions. This energy is primarily used for electricity, heating and cooling in homes and businesses, as well as in the production of local products that are used inside and outside the Beaverton area. Reducing energy use in buildings is the easiest way to reduce overall emissions through energy efficiency upgrades to windows, lighting, heating and cooling systems, and insulation. In addition to using energy more efficiently, the city supports the generation and use of green, renewable energy.

Portland General Electric sources energy from natural gas, coal, hydro, wind and solar. PGE's Green Source program provides customers an opportunity to reduce the carbon intensity of their electricity by investing in renewable power (primarily wind and solar generated). The city purchases 100 percent of its power from renewable sources. In 2018, 29.9 percent of residential customers and 10.6 percent of commercial and large industrial customers in Beaverton purchased one of PGE's renewable energy products. Renewable power accounts for more than 12 percent of the combined total volume of electric power used in Beaverton.

WHAT'S ALREADY HAPPENING



Solar Beaverton

In 2011, the Solar Beaverton pilot project launched, offering bulk purchase discounts on residential solar installations to all Beaverton residents. Fifty households installed a total of 150kWh of solar power and in 2017, the city offered a second version of the Solar Beaverton Program, with discounts on solar installations, advanced battery storage and smart thermostats for its residents.



Energy Efficiency/Weatherization

In 2019, the city partnered with Community Action's Energy Conservation Program to improve the energy usage of income-qualified residents' homes making them more durable, healthier and safer.



Better Buildings Challenge

The U.S. Department of Energy Better Building Challenge (BBC) recognized the city in 2014 for its leadership in reducing energy use in their BBC portfolio. Beaverton and its partners (including the Beaverton School District and Lanphere Enterprises) committed to a 20% energy reduction goal by 2020.



LED Streetlight Conversions

The city received a $1 million Housing and Urban Development (HUD) grant for the Sustainable Communities Challenge. More than 770 traffic signals and streetlights were replaced with LED technology to reduce energy consumption and minimize maintenance expense



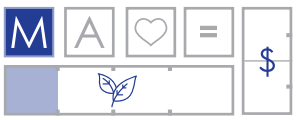
Stormwater

The Creekside Stormwater Master Plan provides guidance for the management and conveyance of surface waters including precipitation, drainage canals, creeks, piped stormwater, culverts and outfalls. The plan incorporates low-impact development approaches and building techniques such as porous pavement, green roofs, rain gardens and bioswales.

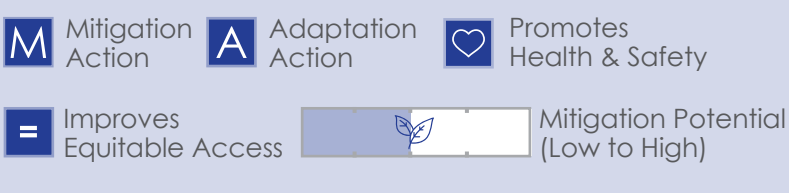


Urban Form

Development Opportunity Strategies - The Development Division is currently working to promote and implement urban revitalization, mixed-use planning and a housing strategy to help build a livable and equitable community for all Beaverton residents. The city offers a variety of incentive programs to make this a reality, including $150,000 in grant funds available to assist redevelopment.

ACTION	EFFECT	KEY AGENCIES
ENERGY SOURCING		
18: Achieve net zero emissions for electricity by 2035		- City/Mayors - PGE
19: Achieve net zero emissions for natural gas by 2040		- City/Mayors - NW Natural
20: Power government operations from renewable energy via on-site installation or off-site procurement		- City/Mayors - PGE
21: Develop micro-grids and energy storage systems in conjunction with purchasing renewable power		- City/Mayors - City/CDD - PGE
22: Develop district energy systems and storage		- City/CDD - PGE
23: Support distributed community solar energy development		- City/Mayor - Energy Trust
ENERGY EFFICIENCY		
24: Develop a community solar project hosted at a city facility		- City/Public Works - City/Mayors - Energy Trust
25: Increase energy efficiency and water conservation in buildings		- City/Public Works - Community Action - Energy Trust
26: Develop strategies for net zero emissions in new development		- City/CDD
27: Develop equitable strategies for commercial and multifamily buildings to meet minimum energy efficiency standards at sale or renovation		- City/Mayor - City/CDD

KEY



ACTION	EFFECT	KEY AGENCIES
ENERGY EFFICIENCY		
28: Develop a building energy score program	M A ♡ = $	- City/Mayor - City/CDD
29: Incentivize energy efficiency improvements	M A ♡ = $	- City/Mayor - Energy Trust - Community Action
30: Support the continued installation of smart meters	M A ♡ = $	- City/Mayor - PGE
31: Support changes to state building code to achieve net zero energy consumption in new buildings by 2030	M A ♡ = $	- City/CDD
32: Provide energy conservation workshops	M A ♡ = $	- City/Mayors - Energy Trust - PGE
HOUSING AND DEVELOPMENT		
33: Incentivize the use of high efficiency technology in new construction and major renovations	M A ♡ = $	- City/CDD - Energy Trust
34: Encourage energy efficiency upgrades during seismic retrofitting	M A ♡ = $	- City/Mayors - City/CDD - Community Action
35: Advocate for development of smaller homes	M A ♡ = $	- City/CDD - Metro
36: Develop strategies to increase housing density	M A ♡ = $	- City/CDD
37: Develop strategies for affordable housing for local workforce	M A ♡ = $	- City/CDD

KEY

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♡ Promotes Health & Safety

= Improves Equitable Access

Mitigation Potential (Low to High)

Cost per ton CO_2e

Cost Saving | Neutral | Investment Required

ACTION	EFFECT	KEY AGENCIES
38: Adopt Oregon's Energy Reach Code and incorporate other low carbon footprint development strategies		- City/CDD - Energy Trust
39: Incentivize certified green building development		- City/CDD
40: Develop code to encourage passive house design		- City/CDD
41: Assess the minimum energy efficiency standards in new and existing affordable housing		- City/CDD - Metro
42: Enhance programs for moving utilities and communications cables underground to protect them from extreme weather events		- City/Public Works - City/CDD - PGE
43: Support a state and/or national price on carbon		- City/Mayors
44: Study impacts of potential population growth due to climate migration and how to adapt to changing demands		- City/Mayors - City/CDD

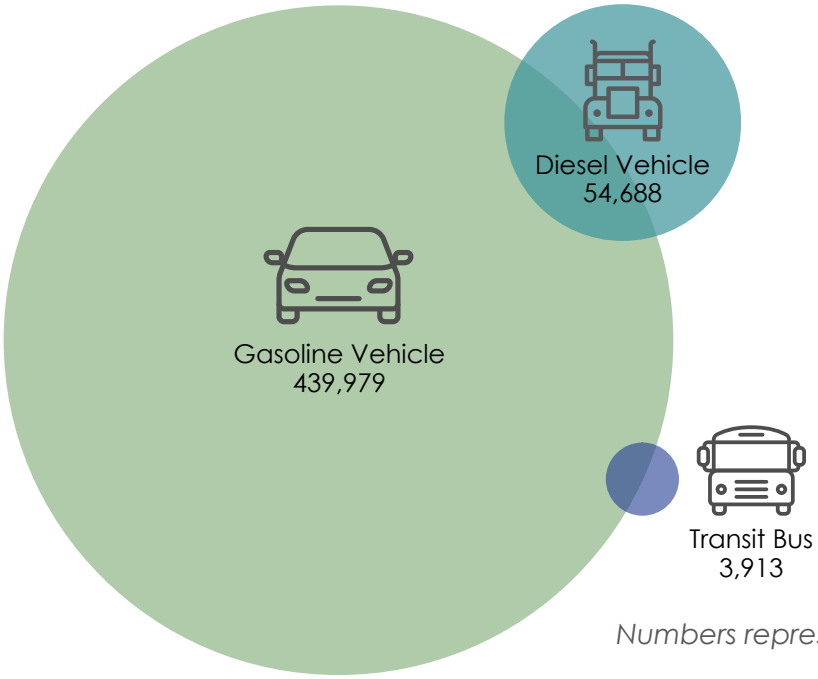
KEY





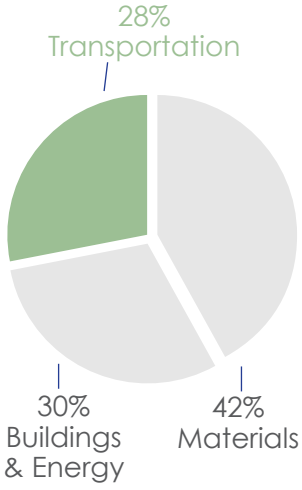
TRANSPORTATION 6

BEAVERTON'S CARBON EMISSIONS: COMMUNITY-WIDE TRANSPORTATION



Numbers represent $MTCO_2e$

GETTING US FROM HERE TO THERE



People and goods move around a community in a variety of ways: car, truck, airplane, bicycle, transit and on foot. The movement of people and goods by vehicles accounts for nearly 27 percent of Beaverton's GHG emissions. Since nearly one-third of all carbon emissions come from transportation, providing cleaner transportation fuels such as lower carbon ethanol and biodiesel, natural gas, biogas and propane will help shrink the transportation-related carbon footprint. Use of cleaner fuels can improve public health and increase local, state and national energy security. The city will also encourage increased use of electric vehicles in the community and move toward an electric city fleet.

As Beaverton grows, transportation systems will have to support rapid commutes to large workplaces while reducing the use of single occupancy vehicles on the roads. By creating an efficient transport network, costs and emissions can be minimized. In 2017, the city adopted an Active Transportation Plan to prioritize safe, connected systems to make walking and bicycling the best option for people to travel to destinations such as schools, employment, transit options, stores and other destinations. The network of roads, sidewalks, trails, and mass transit within and between neighborhoods must also function and adapt to extreme heat, snow and flooding. As extreme weather events become more frequent, studies may be needed to identify vulnerable neighborhoods and additional transportation corridors.

WHAT'S ALREADY HAPPENING



Electric Vehicles

There are eight electric vehicle (EV) charging stations at city facilities for public and city fleet use. As EV's become more available, there will be a need for additional charging infrastructure at both the public and city fleet levels. In 2019, PGE and the city are collaborating to install an "Electric Avenue" of charging stations for public use. The city is working with developers to increase EV readiness in new buildings, as part of a State of Oregon requirement for communities of 100,000 residents or more.



Clean Fuels

The Oregon Department of Environmental Quality's Clean Fuels Program aims to reduce carbon intensity of fuel by ten percent from the 2015 baseline by 2025. This plan is a critical component of Oregon's plan to reduce greenhouse gases in the transportation sector by incentivizing the production and purchases of fuel efficient cars, using cleaner fuels and reducing the amount that Oregonians drive. In addition to reducing greenhouse gases, the program has many co-benefits including reductions in other air pollutants, improvements to public health and increased energy security.



Public Transit

Beaverton is currently served by 19 bus lines, MAX red and blue light rail lines, and the WES commuter rail. Weekend service is reduced to 16 bus lines on Saturdays and 12 bus lines on Sundays, with MAX service running seven days per week.

TriMet continues its efforts to connect neighborhoods with job centers, schools and shopping by expanding service options; increasing frequency of certain bus lines; increasing access to transit by improving sidewalks and crosswalks; linking MAX with employers by providing access to covered bike parking and car-sharing options; and providing shuttle services where ridership cannot support a traditional bus line. In 2019, TriMet introduced the region's first electric bus in Beaverton.



Reducing Congestion

Helping people get where they need to go safely and efficiently is a top priority for Beaverton. The transportation chapter of the city's Comprehensive Plan includes goals to create an efficient transportation system that reduces the percentage of trips by single occupant vehicles, reduces the number and length of trips, limits congestion and improves air quality.



Active Transportation Plan

The city has developed an Active Transportation Plan to promote walking and biking, establishing a foundation for developing well-connected, attractive bike and pedestrian networks that are safe, convenient and user-friendly for people of all ages and abilities, whatever mode of transportation they use. One of the goals of the plan is to ensure that all neighborhoods in Beaverton have options for walking, bicycling and transit. In 2018, Beaverton issued a request for proposals for dockless bike share and is working to implement this and other last-mile solutions.

ACTION	EFFECT	KEY AGENCIES
ELECTRIC VEHICLES		
45: Develop strategies to accelerate community transition to electric and high efficiency vehicles with consideration for all income levels		- City/Mayors - City/CDD - PGE - Forth
46: Develop an electric vehicle charging strategy in the public right-of-way		- City/Mayors - City/CDD - City/Public Works - PGE
47: Update city code to incorporate electric vehicle charging infrastructure at multifamily and commercial developments		- City/CDD - PGE
48: Support the electrification of school bus fleet and the installation of fast charging equipment		- City/CDD - BSD - PGE - Metro
TRANSIT SYSTEMS		
49: Expand public transit service, including increased frequency, more connections to other transit modes, underserved communities and popular destinations		- City/CDD - TriMet - Metro
50: Continue to support Safe Routes to Schools program		- City/CDD - ODOT - BSD - Metro
51: Address last mile connection in transportation policy		- City/CDD - Washington County - Metro - ODOT
52: Expand public transit electric bus fleet		- City/CDD - TriMet - PGE - Metro
53: Complete bicycle and pedestrian gaps and create new connection options for community members		- City/CDD - Metro - Street Trust - WTA
54: Continue implementation of the city's Active Transportation plan to enhance bicycle and pedestrian friendly transportation for all neighborhoods		- City/CDD - Metro - Washington County - ODOT

KEY

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A Adaptation Action

Promotes Health & Safety

= Improves Equitable Access

Mitigation Potential (Low to High)

Cost per ton CO_2e

Cost Saving

Neutral

Investment Required

TRANSIT SYSTEMS

ACTION	EFFECT	KEY AGENCIES
55: Develop street standards to make streets safer and more welcoming to pedestrians and cyclists		- City/Mayors - City/CDD - City/Public Works
56: Use smart traffic management technology to actively manage the transportation system		- City/Public Works - Washington County - ODOT
57: Promote and incentivize car-share and ride-share programs as an alternative to individual car ownership		- Private Providers - WTA
58: Support alternative methods for distribution/delivery of goods		- City/Mayors
59: Seek and advocate for funding sources to support transportation investments		- City/Mayors - City/CDD - City/Public Works - ODOT
60: Partner with businesses and associations to explore options to reduce employee commutes		- City/CDD - ODOT - Washington County - WTA
61: Implement a shared mobility pilot project		- City/CDD - Washington County - WTA

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NATURAL SYSTEMS 7



GREEN SPACES AND WATER

A changing climate will directly affect city parks, urban forests and stream systems as well as drinking water and waste water. Working with partners such as Tualatin Hills Park & Recreation District and Clearwater Services, the city will focus efforts on developing an urban canopy and water systems that are resilient to heat, drought, fire, flooding and other weather events that may become more intense. Water must be carefully managed both in the summer to avoid scarcity and provide cooling, and in the rainy season to avoid flooding and landslides. While trees are a source of shade that protect people and retain water, they are subject to fire and disease that may result from a warming climate. The proper transition to trees that can adapt to future conditions must be carefully managed and water conservation must continue to be a priority.

Climate variability will increase risks to water supplies. Water-use efficiency and conservation efforts over the last 30 years have resulted in total U.S. water consumption staying relatively constant and the greatest gains in efficiency are most evident in urban centers. Although there are many efforts to protect and conserve water in the city of Beaverton, more will need to be done to keep water quantity and quality standards sustainable.

WHAT'S ALREADY HAPPENING



Greenspaces and Conserving Water

The Tualatin Hills Park and Recreation District (THPRD) manages most of the greenspaces in Beaverton. In 2015, THPRD implemented a strategy to reduce irrigation at parks and athletic fields, which decreased water use at 70 percent of THPRD park sites. They are also pursuing other conservation strategies including use of weather-based irrigation controllers, integration of drought tolerant grass seed blends, modification of existing system layouts to focus on plant health, installation of water-efficient nozzles, reduction of manually watered sites and elimination of leaks and misdirected use through irrigation system performance audits.

THPRD continues to plant flora species that are native and suitable to the area, including those that have a wider tolerance for changing conditions.

THPRD has fire plans in place for some of their natural area sites that incorporate mowing and creating fire breaks that will lessen the impact should a fire occur.



Drinking Water

The City of Beaverton supplies water to approximately 74 percent of city residents. In addition to above ground reservoirs, the city stores an additional 450 million gallons of treated water in natural underground basalt formations using a system called aquifer storage and recovery (ASR). Water that is stored in the system during winter and spring is pumped out during summer months when demand increases. ASR conserves surface water from rivers and dams during environmentally stressful summer seasons.



Water Pipe Maintenance & Upgrades

The city has identified 150,000 linear feet of existing waterlines that need replacement over the next 30 years. The city's ongoing replacement of old system components and expansion of the water infrastructure system will provide improved water service to existing city water customers and accommodate expected growth. These pipes are under pressure and fully restrained and should generally be resilient to flooding and infiltration.



Wastewater Treatment

Clean Water Services (CWS) is the water resources management utility for Washington County that treats more than 60 million gallons of wastewater each day at four facilities. CWS recovers more than half of the phosphorus from used water and converts it into fertilizer, preventing it from being discharged back into waterways. The utility has also planted more than four million trees and shrubs in riparian areas in the Tualatin River Watershed to mitigate thermal loads discharged from its facilities. These plantings also stabilize stream banks, shade waterways and provide essential wildlife habitat.

Water Treatment – At Clean Water Services' Rock Creek facility, structures at risk of flooding have been elevated/flood proofed. All four treatment plants have back-up emergency power.

ACTION	EFFECT	KEY AGENCIES
WATER		
62: Identify and fix leaks in water delivery system. Establish routine meter replacement and monitoring		- City/Public Works
63: Develop strategies for increased use of high efficiency appliances and smart irrigation systems		- Energy Trust
64: Expand greywater and rain collection programs		- City/Public Works
65: Provide water conservation workshops		- City/Public Works - City/Mayors - Clean Water Services
66: Upgrade water storage pumps for energy efficiency and renewable power		- City/Public Works
URBAN FLORA		
67: Investigate impact of algae blooms on water systems		- City/Public Works
68: Promote project designs that exceed minimum standards for energy efficiency and storm water management		- City/CDD - City/Public Works - THPRD - Clean Water Services
69: Enhance street tree strategy to increase water retention, mitigate heat island effect through increased urban canopy		- City/Public Works
70: Expand backyard habitat program		- City/Mayors - Audubon Society
71: Develop strategies for responding to extreme flooding in high risk transportation corridors		- City/Mayors - City/Public Works - Clean Water Services - Washington County

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Mitigation Potential (Low to High)

Cost per ton CO_2e

Cost Saving — Neutral — Investment Required

ACTION	EFFECT	KEY AGENCIES
NATURAL DISASTERS		
72: Identify impact of slide-prone areas in and around Beaverton		- City/Mayors - City/Public Works - Washington County - ODOT
73: Study the impact of prolonged drought conditions and increased risk of wildfire on local infrastructure		- City/Mayors - City/Public Works - City/CDD - Washington County
74: Develop a storm water mitigation plan to respond to extreme flooding		- City/Public Works - City/CDD
75: Update tree list for hardiness to reflect expected future conditions		- City/Public Works
76: Prepare for increased urban wildfires near forested areas as a result of drier summers		- City/Mayors - City/Public Works

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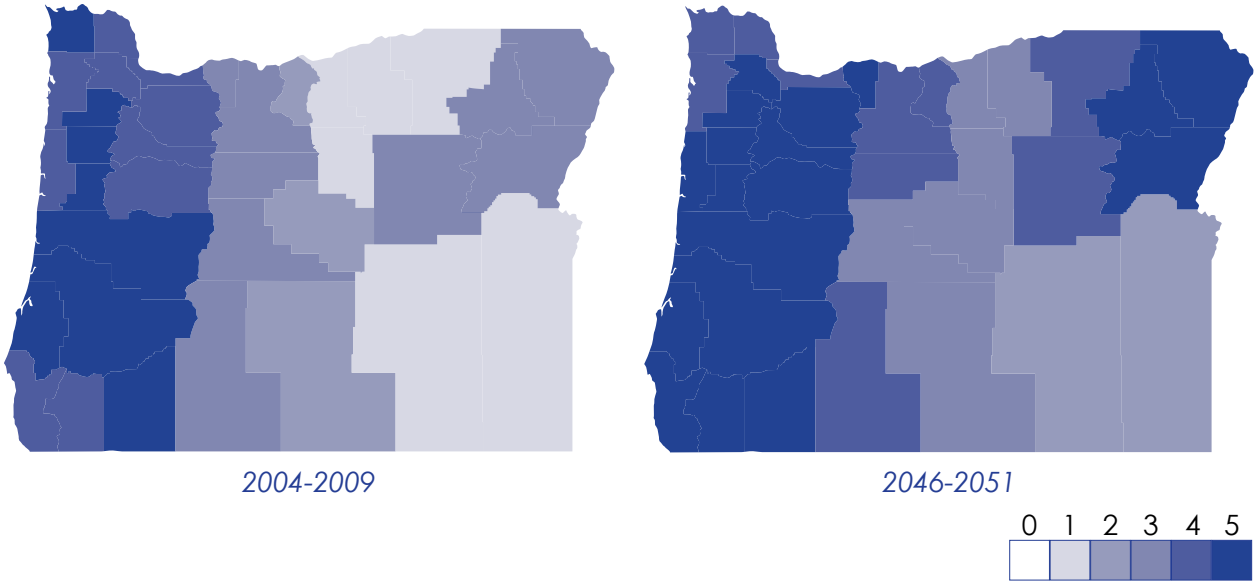
Mitigation Potential (Low to High)

Cost per ton CO_2e



Cost Saving — Neutral — Investment Required

COMMUNITY WELLBEING 8



These maps indicate the extent of fire smoke risk to the public during fire season (May-October) as forest fires become more frequent and consume more land over time.

HEALTH IMPACTS OF CLIMATE CHANGE

The health, safety and wellbeing of Beaverton's residents will be affected by a changing climate. As the climate shifts, a collaborative regional response will be necessary to address the changing conditions such as prolonged heat, poor air quality and shifting ranges for disease vectors. These will come in both acute and chronic episodes that will require not just emergency response, but also a change in priorities for educating the public on how to keep themselves physically and mentally well. The city will need to increase services such as access to warming and cooling shelters and Individual households will need to prepare for a changed daily life and for moments that require an emergency plan and kits.

One of the most acute health-related impacts in our region could be related to increased wildfire smoke. A 2019 study confirmed the link between wildfire smoke exposure and respiratory health outcomes. Evidence appears clear for the exacerbation of asthma as a result of wildfire smoke exposure. Premature death and adverse chronic and acute cardiovascular and respiratory health outcomes result from the increase in particulate matter caused by wildfire smoke.[14] In response to this health hazard, community members and health authorities need to be able to find ways to avoid inhalation and manage the increased need for medical resources to treat the results of both long and short-term exposure.

WHAT'S ALREADY HAPPENING



Severe Weather Shelters

The City of Beaverton opened a severe weather shelter in 2017 at the Beaverton Community Center that provides space for 30 adults on Thursday nights or when temperatures dip below freezing, November through March. Beaverton's program works in conjunction with a Washington County Severe Weather Shelter Response Plan to provide temporary shelter to people experiencing homelessness when there is a period of two or more days when temperatures are forecast to reach 32 degrees Fahrenheit or below.



Emergency Preparedness

The city has a robust Emergency Management Division that educates residents and businesses on how to make a plan, build a kit, and prepare their homes and vehicles for resiliency. Volunteer Community Emergency Response Team (CERT) members have been trained to respond safely, responsibly and effectively to emergency situations. The Beaverton Natural Hazard Mitigation Plan was developed in an effort to reduce future loss of life and property resulting from natural disasters including climate related events such as floods, severe weather, landslides, and wildfires, as well as earthquakes and volcanic eruption.



Countywide Coordination

The City of Beaverton is a member of the Emergency Management Cooperative (EMC), a countywide, integrated system to prepare for, respond to, recover from and mitigate against disasters. Members include Washington County; the cities of Cornelius, Forest Grove, Sherwood, Tigard, and Tualatin; Clean Water Services; and Tualatin Valley Fire & Rescue.



Emergency Response

Since 2010, paramedics from Tualatin Valley Fire & Rescue have responded to non-fire medical emergencies by SUV rather than by firetruck. Of the thousands of emergency calls, only a small fraction involve an actual fire. Using SUVs allows paramedics to be nimbler, while reducing fuel consumption, greenhouse gases and diesel emissions. Developing methods like this allows for a more distributed response to more frequent, smaller events, while ensuring the larger equipment is available for the larger events.

ACTION	EFFECT	KEY AGENCIES
77: Develop a communication plan for high risk climate-related events impacting public health to include age, economic resources and location		- City/Mayors - Washington County - OHA
78: Coordinate mutual aid agreements between government agencies		- City/Mayors - Washington County
79: Support capacity of neighborhood and community groups to implement climate mitigation and adaptation actions		- City/Mayors
80: Train Community Emergency Response Teams (CERT) to assist vulnerable populations during extreme events		- City/Mayors
81: Develop plans to address climate-related impacts on physical and mental health		- City/Mayors - Washington County
82: Improve access to warming and cooling centers		- City/Mayors
83: Develop wildfire smoke rescue centers		- City/Mayors
84: Produce urban heat island map to show risk by neighborhood		- City/Mayors
85: Expand local food security and emergency distribution plans prioritizing the needs of vulnerable populations		- City/Mayors
86: Incorporate energy efficiency and climate-related risks to health in Healthy Housing Initiative		- City/Mayors

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Mitigation Potential (Low to High)

Cost per ton CO_2e

Cost Saving

Neutral

Investment Required

9 NEXT STEPS TO A CLIMATE RESILIENT BEAVERTON

> There is no single solution for solving global climate change, but cities have the ability, capacity and will to lead.
>
> – C40 Cities

MOVING FORWARD

The Beaverton Climate Action Plan was created to provide a comprehensive framework to reduce GHG emissions and to prepare the community for the impacts of climate change. Locally and around the globe, people are already experiencing these impacts and it has become increasingly clear that local leadership and individual actions will be the driving force to address the most critical issue of our time.

To achieve Beaverton's climate goals, the city aims to prioritize targeted actions, find synergies with existing programs and continue building strong partnerships with multiple government agencies and community organizations.

Federally – Beaverton is part of networks such as Urban Sustainability Directors Network (USDN) and Local Governments for Sustainability (ICLEI) that are committed to addressing climate change. The city is a signatory to the U.S. Mayors Climate Protection Agreement and part of programs such as the US Department of Energy Better Building Challenge. Through these programs, Beaverton can be part of the development of efficient and cost effective ways to cut emissions.

Statewide – In 2007, the Oregon legislature established statewide GHG emissions reduction goals and created the Oregon Global Warming Commission. In 2019, the legislature considered a bill to update emission targets and regulate the price of carbon. Although HB2020 (sometimes known as the Clean Energy Jobs bill) did not pass, the concepts are expected to serve as a foundation for legislation in a future session.

Regionally – Beaverton is an active member of the USDN Cascadia Network as well as the Partners for a Sustainable Washington County Community. These groups share best practices and collaborate on regionally applicable projects. The city is also partners with Metro regional government on a number of programs dedicated to addressing the impacts of climate change.

Locally – The energy and water utilities that serve the Beaverton community, parks and government agencies, transportation and waste service providers, as well as housing and sustainability professionals have all been important partners developing the BCAP and will play key roles in its implementation.

Community – Residents, businesses, schools and community organizations — everyone who makes up our diverse population — are the collective, driving force in undertaking the Beaverton Climate Action Plan. No individual action, city effort, or statewide program will ultimately be the sole reason for success in reducing carbon emissions and adapting to a changing global climate, but together, these cumulative actions can, and will, make a difference for Beaverton residents, Oregonians, Americans, and people around the globe.

CULTURAL BENEFITS

- Increased and improved green public spaces encourages creative and cultural events to be hosted in the city's parks
- A connected network of walking and cycling routes enhances access throughout Beaverton
- Better public transport systems improve participation in and access to the city's cultural and creative venues and events

ECONOMIC BENEFITS

- Reducing greenhouse gas emissions and adapting to climate change creates a low carbon economy, increases job opportunities and lowers utility bills.
- A greener, cleaner and cooler city is more attractive to residents and workers
- Improved transportation systems reduce congestion and improve productivity

CLIMATE EQUITY

- Lower-income and frontline community members save money through lower utility bills by using less energy and water and producing less waste
- Green spaces in the city contribute to people's physical and mental health and wellbeing, by providing places to socialize, play, exercise and relax
- Improved transport options improve access to essential services and employment opportunities

WHAT IS NEXT?

- Engage in community conversations with anyone who lives, works or plays in Beaverton about local climate impacts and how to work together to reduce emissions and adapt to changes in climate that are already happening
- Prioritize and begin implementation of action items in this plan
- Conduct periodic greenhouse gas inventories to monitor progress toward reduced emissions
- Ensure that mitigation and adaption actions enhance social equity throughout the community
- Provide an annual progress report to the community and update the full plan at least every five years.
- Recognize that slowing climate change starts with each one of us – we must act collectively and we must act individually:
  - Consider opportunities to reduce emissions from the choices of goods and services
  - Sign-up for renewable power from electricity or natural gas providers,
  - Collaborate with family members or neighbors,
  - Participate in the Beaverton Climate Challenge (an online household engagement tool to guide reducing GHG emissions)



APPENDICES

GLOSSARY

Active Transportation
Any form of human-powered transportation: walking, jogging, running, cycling, using a wheelchair, in-line skating, or skateboarding.

Carbon Footprint
The amount of carbon dioxide and other carbon compounds emitted due to the consumption of fossil fuels by a particular person or entity

Carbon Intensity
The amount of greenhouse gases emitted per unit of energy consumed in the production of goods or providing a service.

Climate
The prevailing weather conditions in a geographic area over an extended period of time

CO2e
Carbon dioxide equivalent, a standard unit for measuring carbon footprints. Used to express the impact of each different greenhouse gas in terms of the amount of CO2 that would create the same amount of warming. That way, a carbon footprint consisting of different greenhouse gases can be expressed as a single unit.

Co-Benefits
Benefits of an action to the community in addition to reducing greenhouse gas emissions

Complete Neighborhoods
Neighborhoods where one has safe and convenient access to goods and services needed in daily life. A complete neighborhood meets the needs of people of all ages and abilities.

Disease Vectors
Ways by which infectious diseases are transmitted to a person or organism. Mosquitos and ticks are common disease vectors, as well as bacteria that cause foodborne illnesses.

Greenhouse Gases
Gases emitted into the atmosphere by both natural and manmade sources that contribute to the warming of Earth's climate by trapping heat in the atmosphere. The most common of these gases are superheated Water Vapor, Carbon Dioxide (CO2), and Methane.

Heat Island Effect
The tendency of average temperatures in urban areas to be higher than surrounding rural areas. This is caused by human activities and the ability of concrete to retain heat throughout cooler parts of the day.

Household Consumption
The overall material goods purchased, used, and disposed of by each residential household.

Last Mile Connections
The gap from public transit to a commuter's final destination. Commuters typically walk or bike this distance, which, in many neighborhoods, may lack adequate pedestrian or bike paths.

Micro-Grid
A group of connected electricity sources that are smaller than utility grids, and are localized to meet the needs of neighborhoods or small communities rather than entire cities. Renewable energy from various sources are easily connected to micro-grids.

MTCO2e
The standard unit of measure for greenhouse gases. This measurement was designed to make the impact of various greenhouse gases uniform to that of a metric ton of carbon dioxide, and therefore easier to measure.

Natural Systems
All the physical and biological material and their interconnected processes that exist in nature, independent of any human involvement.

Net Metering
A system with locations that generate electricity (through solar panels or other sources of renewable energy) to offset the cost of power.

Net Zero Emissions
Balancing carbon emissions with the purchase or generation of renewable energy, achieved through reducing carbon emissions with increased consumption of renewable energy.

Parts-per-million (PPM)
The concentration of a gas or particles in the air.

Passive House
Design practices where significant carbon emission and energy-use reductions overlap with cost-effectiveness to create highly efficient and affordable homes. These homes allow for heat to be better distributed throughout their structure, thus preventing overheating in summer or excessive loss of heat in winter.

Renewable Energy
Energy generated from natural sources that are not depleted when used. These natural sources are continuously replenished or constant on a human timescale. Renewable energy can be generated by sunlight, wind, water, or underground heat sources.

Reuse
Using previously used materials for the same or different purpose. Reuse is distinguished from recycling, as reused materials are not broken down to make raw materials for manufacturing new products.

Salvage
Recovering usable material from items and structures that would otherwise be dismantled and disposed of as garbage

Sequester and Sequestration
The removal of carbon dioxide from the atmosphere and storing it in a solid form.

Share Program
Like a library, share programs allow people to check out items for short-term use rather than purchase the item new. Share programs can be hosted by private, public, or community organizations.

Smart Traffic Management Technology
Traffic signals and sensors that regulate the flow of traffic in response to real-time demand to drive on certain roads and through certain intersections. These systems reduce congestion and idle-time, and therefore air pollution caused by vehicles.

Sustainable Procurement Policies
Outlines an organization's commitment to prioritize purchasing goods and services with minimal environmental impact.

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A note from the designer

The work of protecting our planet is the work of every one of us. It's something we can do, in even the smallest ways, in our every day lives. In keeping with the spirit and efforts of this plan, many design elements were carefully considered and implemented – some in an effort to reduce the resources needed to produce this document; some simply to reflect a handful of the ideas of this document in subtle design decisions. These include:



This document is 7.5"x10", an odd size that allows the document to be "full bleed" but reduces the amount of resources used



Nearly all "black" text is 80% fill- using less toner to produce. This technique was also applied to many of the color elements you see as well



All the photos are printed in black and white and nearly all have a screen over them to also help reduce the amount of toner used



This document was designed to view on a digital platform, and the City of Beaverton has committed to printing a minimal amount of copies



Many of the lines you see in this document are 1.5pt thick, and many at a 34.7 degree angle, designed to represent the degrees the city is setting as its goal with this plan



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