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# CLIMATE RESILIENCE

# IX. CLIMATE RESILIENCE

## PURPOSE

The Climate Resilience Element is designed to help Fircrest remain resilient in the face of climate impacts. The element is intended to provide the City with a consolidated policy framework for climate change planning and to assist in meeting the planning goals of the Growth Management Act.

## INTRODUCTION

The Climate Resilience Element is divided into two sub-elements: the Resilience Sub-element addresses efforts in Fircrest to increase the City's resiliency to climate impacts, build equity, and reduce risks of climate change impacts, while the Mitigation Sub-element addresses efforts in Fircrest to decrease Fircrest's contribution to climate change, primarily through the reduction of greenhouse gas emissions. Broad climate goals were identified that encapsulate the City's efforts to reduce its contribution to climate change and help prepare the community for potential climate impacts so the City is able to adapt and thrive in the face of climate change. The goals and policies in this element have been cross-referenced with other elements of this Comprehensive Plan where applicable.

## STATE PLANNING CONTEXT

### Growth Management Act

The Washington State Growth Management Act now requires cities to include a Climate Element in their comprehensive plans under HB1181. Climate elements must include the following sub-elements:

- Resilience sub-element: Includes goals and policies to improve preparedness, response, and recovery efforts for climate impacts.
- Greenhouse gas mitigation sub-element: Includes goals and policies to reduce greenhouse gas emissions through strategies such as reducing vehicle miles traveled.

## REGIONAL PLANNING CONTEXT

### Vision 2050 Multicounty Planning Policies (MPPs)

Under the Growth Management Act, multicounty planning policies provide a common region-wide framework for countywide and local planning in the central Puget Sound region, including climate change mitigation and adaptation goals. The MPPs provide guidance for implementing Puget Sound Regional Council's VISION 2050 Regional Growth Strategy. The strategy includes climate change policies that promote actions to reduce greenhouse gas



emissions, reduce building energy use, and address vulnerable populations and areas that have been disproportionately impacted by climate change.

## Pierce County Countywide Planning Policies (CPPs)

The Pierce County Countywide Planning Policies is a written policy statement that establishes a countywide framework from which county and municipal comprehensive plans are developed and adopted. The framework is intended to ensure that municipal and county comprehensive plans are consistent.

The CPPs are intended to provide guiding goals, objectives, policies, and strategies for the subsequent adoption of comprehensive plans. CPPs that offer guidance for development of the Climate Resilience Element include ones that address the reduction of greenhouse gases, such as through reducing VMT or increasing carbon sequestration, and identify and address local climate impacts, such as sea level rise and extreme heat.



*City Hall in the Fall*

## LOCAL PLANNING CONTEXT

A discussion on climate impacts and vulnerability in Fircrest can be found in Appendix G and was used as the basis for developing the goals and policies in this element.

## GOALS AND POLICIES

This Element contains the climate resilience goals and policies for the City of Fircrest which were developed to prioritize vulnerable populations and infrastructure in Fircrest and target reductions in greenhouse gas emissions from transportation and building energy, which are likely Fircrest's main sources of greenhouse gas emissions. The goals and policies are categorized into resilience or climate adaptation and greenhouse gas mitigation categories, but some policies can be applied to both adaptation and mitigation efforts in Fircrest. The goals establish broad direction for enhancing resilience and reducing Fircrest's contribution to greenhouse gas emissions, while the policies provide more detail about the outline steps needed to meet the intent of each goal. Most goals and policies are cross referenced with other elements in this Comprehensive Plan, as shown in parentheses following the policy number, i.e., Policy CR-1.1(TR-4.6).

### Resilience Sub-Element

The resilience goals were identified based on the climate impacts that are likely to impact Fircrest in the next 20+ years, as well as Fircrest's current efforts to increase resiliency and adaptive capacity. They prioritize vulnerable populations in Fircrest, such as those who have been historically marginalized or are currently living in poverty. Greater discussion can be found in Appendix G. The goals guide Fircrest's development to help improve carbon sequestration, reduce flooding risks, and ensure climate impacts are not disproportionately experienced by historically marginalized communities.

**Goal CR-1 (Goal CD-6): Plan, manage, and preserve a healthy urban forest that increases carbon sequestration in Fircrest and reflects community urban design goals by establishing effective programs, practices, landscaping standards, and guidelines.**

*Policy CR-1.1 (Policy LU-15.1)*

Protect and enhance street trees to increase shade, reduce the urban heat island effect, increase carbon sequestration, improve air quality, and improve the mental and physical health of residents, prioritizing frontline communities, or those that will be most affected by climate change.

*Policy CR-1.2 (Policy CC-6.1)*

Require landscaping with a drought-tolerant native plant component (trees, shrubs, and groundcovers) to be installed with new construction and substantial alterations of existing structures, parking areas, streets, and sidewalks.

*Policy CR-1.3 (Policy T-12.2)*

Adopt design standards to improve water quality and create more appealing streetscapes. Emphasize the use of landscaping elements in street improvement projects that help curb

stormwater runoff – bioswales, planters, rain gardens, and street trees – and that are mutually beneficial for mobility and ecology. Design these green elements to be deterrents of crashes and injuries and contribute to a more comfortable and visually interesting environment for all users. When designing complete streets, include trees and other plants to clean runoff and manage stormwater at the site. Use traffic-calming elements like traffic circles, chicanes, islands, and curb extensions to provide site opportunities for bioswales, street trees, and rain gardens.

**Goal CR-2 (Goal LU-11): Manage surface, ground, storm, waste, and creek waters in an ecologically responsible manner and as interconnected components of the region's watershed to achieve a healthy watershed that is resilient to climate change.**

*Policy CR-2.1 (Policy LU-10.13)*

Ensure that there is “no net loss” of wetlands by ecological function and values. Protect and enhance wetlands where possible to maintain and increase their carbon sequestration potential.

*Policy CR-2.2 (Policy LU-11.8)*

Require, Low Impact Development (LID) in areas where soils and geology support it to protect groundwater used for the public water supply in accordance with EPA Phase II Western Washington Municipal Stormwater Permit directives.

Review and revise development policies and regulations to support the use of LID more fully where feasible to improve their effectiveness. Consider the adoption of the Low Impact Development Technical Guidance Manual for Puget Sound, which was prepared by the Washington State University Extension and Puget Sound Partnership with the participation and support of a broad range of stakeholders.

**NEW Policy CR-2.3**

Encourage municipal reclaimed water systems and allow onsite non-potable water systems to reduce water demand in private-sector commercial and residential buildings.

**NEW Policy CR-2.4**

Develop a fund to build and maintain green infrastructure projects that help capture, filter, store, and reuse stormwater runoff, prioritizing infrastructure near the golf course, wetlands, and public parks in Fircrest.

**NEW Goal CR-3 (Policy LU-15.2): Establish development regulations that incorporate best practices for reducing extreme heat, the urban heat island effect, wildfire, flooding, and other climate-exacerbated hazards and impacts.**





*Map of Existing Delineated Wetlands In Fircrest. Climate Change May Increase Flooding of these Areas*

**NEW Policy CR-3.1**

Develop design standards to integrate exterior building features that reduce the impacts of climate change and increase resilience, i.e., structures to provide continuous shade on sidewalks, utilizing cool roof strategies of using light colors or other reflective materials or green roofs to reduce costs for building cooling and heat-related impacts on human health.

**NEW Goal CR-4: Protect vulnerable infrastructure and the local economy from climate impacts.**

**Policy CR-4.1 (Goal T-14)**

Protect the City's transportation system against disaster and develop prevention and recovery strategies and coordinated responses.

**NEW Policy CR-4.2 (Policy LU-14.8)**

Ensure that Fircrest's local economy is resilient to climate disruptions and supports businesses' efforts to bolster climate preparedness to support continuity of operations.

**NEW Policy CR-4.3**

Prioritize at-risk community members for actions that mitigate wildfire smoke, such as providing face masks and air filters or incentivizing updates to facilities that serve high-risk populations.

**NEW Policy CR-4.4**

Coordinate with Pierce County to update the Hazard Mitigation Plan. Coordinate emergency management with county, regional, or federal agencies on managing climate change to prevent climate-related disasters from impacting existing assets and exacerbating disparities among at-risk populations, such as those living without shelter, shade, or sanitary facilities.

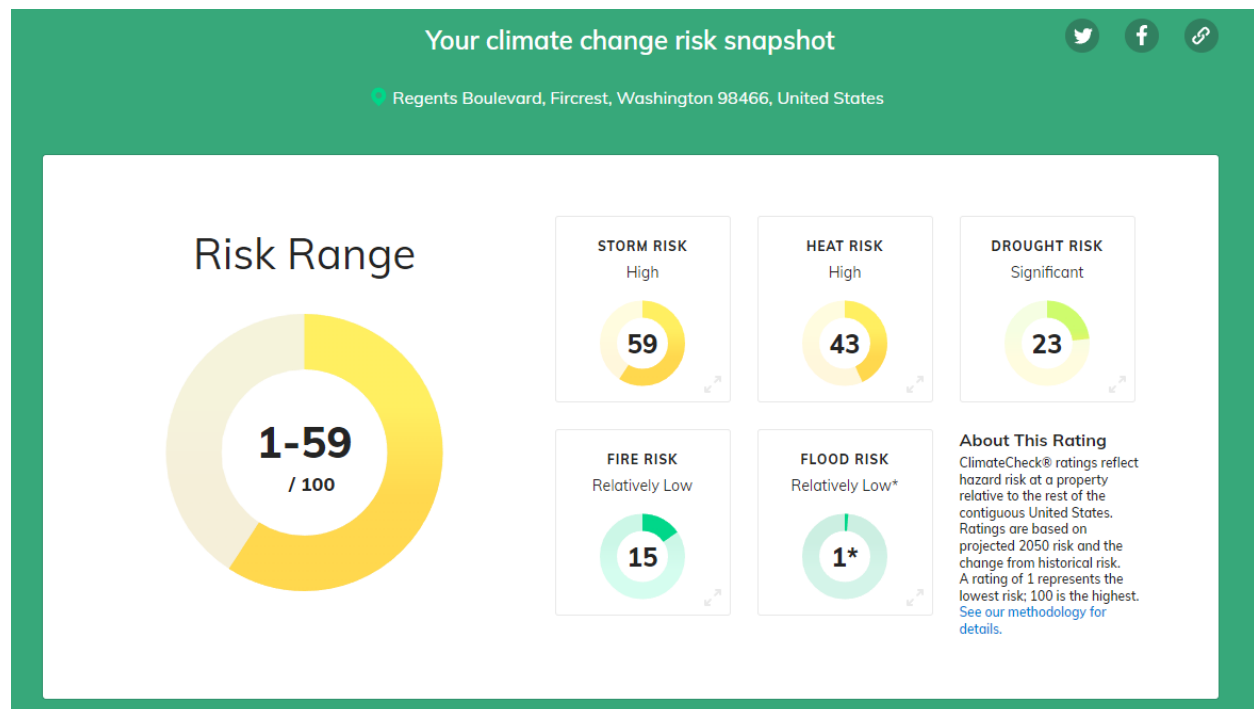
**NEW Goal CR-5: Consider future climate conditions and climate impacts when siting and designing new capital facilities, utilities, and other public facilities.**

**NEW Policy CR-5.1 (Policy LU-7.9)**

Consider future climate conditions during the siting and design of capital facilities to ensure they function as intended over their planned life cycle. Site essential public facilities outside of the 500-year floodplain.

**NEW Policy CR-5.2 (Policy CF-7.5)**

Consider future climate conditions, i.e., changes to temperature, rainfall, and sea level during the siting and design of capital facilities. Site capital facilities outside of the 500-year floodplain to avoid flooding impacts and ensure the facility can operate as intended over its planned life cycle.



**NEW Policy CR-5.3 (Policy P-6.5)**

Enhance the resilience of existing park, recreation, and open space facilities by assessing and addressing climate hazards and impacts to ensure the facilities can benefit the community long-term.

***NEW Policy CR-5.4***

Incorporate sea-level rise information into criteria for siting critical infrastructure, land use planning, and emergency management.

**NEW Goal CR-6: Ensure that community members are equitably prepared for climate impacts.**

***NEW Policy CR-6.1 (Policy P-2.9)***

Ensure that all community members have equitable access to green space and other recreational facilities.

***NEW Policy CR-6.2***

Develop emergency preparedness programs and outreach materials to increase residents' awareness of emergency responses and make evacuation quicker and safer. Ensure that any outreach materials are translated to multiple languages to reach all residents.

***NEW Policy CR-6.3***

Designate or develop community facilities that can be used as community-serving facilities to support residents, coordinate communication, distribute resources and serve as evacuation centers, cooling centers, or places for residents to escape wildfire smoke during periods of prolonged heat or smoke exposure.

***NEW Policy CR-6.4***

Engage overburdened, low-income, and historically marginalized communities in participatory budgeting efforts in order to support equitable distribution of funding to build resilient communities and reduce emissions.

***NEW Policy CR-6.5***

Promote the use of health impact assessments and other tools to address the potential impacts of health, equity, and climate change on vulnerable communities in Fircrest, prioritizing climate preparedness in areas and for populations that will be most affected by climate change.

## ***Greenhouse Gas Mitigation Sub-Element***

The reduction of greenhouse gas emissions is crucial for cities to pursue to begin reducing the impacts of climate change. Greenhouse gas (GHG) emissions mitigation include actions to reduce or eliminate emissions of greenhouse gases in order to reduce the rate and intensity of climate impacts. Many of Fircrest's goals and policies in other elements such as the Transportation and Land Use Elements align with and are cross-referenced to supplement the climate mitigation goals listed here. Some goals and policies listed here indirectly assist in greenhouse gas mitigation, such as by decreasing vehicle miles traveled (VMT) which can lead to reductions in GHG emissions.

**NEW Goal CR-7: Reduce GHG emissions from transportation related activities and infrastructure in Fircrest.**



**Policy CR-7.1 (Goal T-12)**

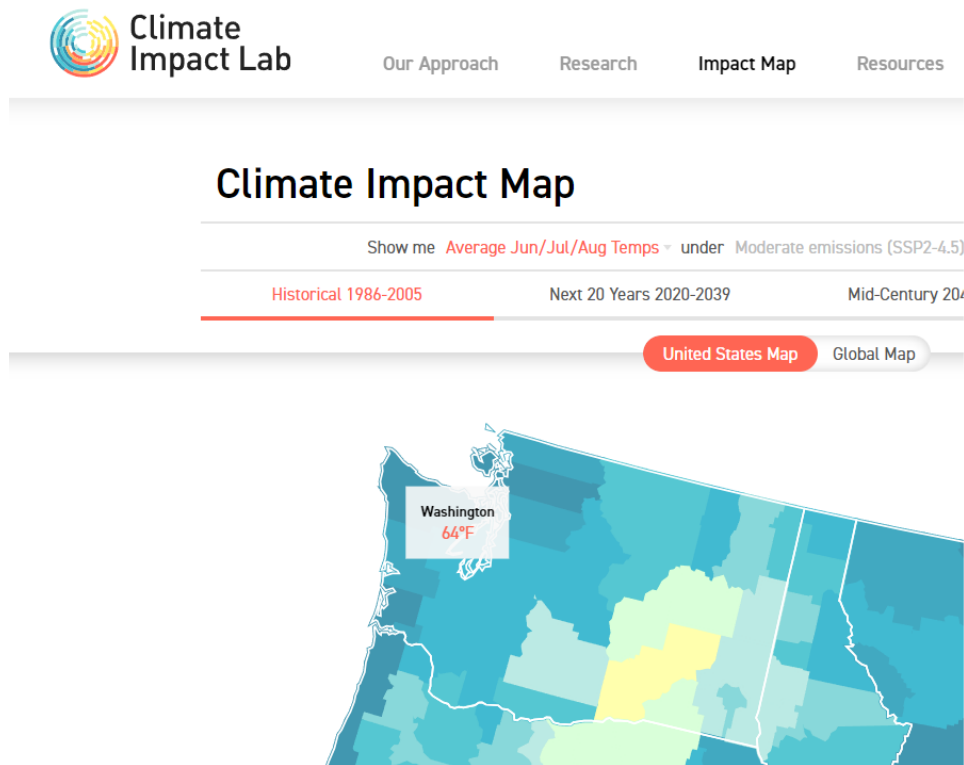
Reduce environmental impacts and greenhouse gas emissions associated with transportation infrastructure and operations.

**Policy CR-7.2 (Goal T-1)**

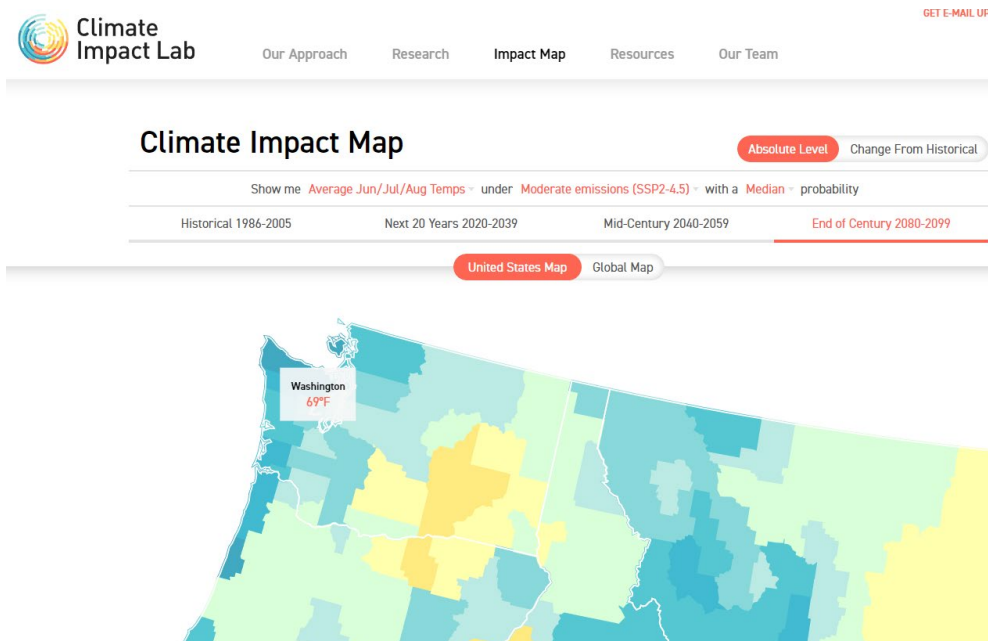
Develop, maintain, and operate a multi-modal transportation system that provides for the safe, efficient, and reliable movement of people, goods, and services.

**Policy CR-7.3 (Goal T-2)**

Provide transportation improvements for alternative and multi-modal transportation choices that ensure equitable and accessible mobility choices for all people. This involves providing special attention to the needs of those with special needs, including persons with disabilities, the elderly, young, and low-income populations, and racially and socio-economic diverse community members.



*Data Indicating an Average Summer Temperature in Fircrest From 1968-2005*



*Data Projecting an Average Summer Temperature Will Increase Five Degrees Fahrenheit by 2099*

**Policy CR-7.4 (Goal T-10)**

Implement TDM strategies to achieve efficient use of transportation infrastructure, increase the person-carrying capacity, accommodate and facilitate future growth, and achieve Fircrest's land use objectives.

**Policy CR-7.5 (Policy T-12.1)**

Enhance strategies that improve air quality and reduce greenhouse gas emissions. Build complete streets with sidewalks and bike lanes, green streets to improve air and water quality, and coordinate with transit agencies. Support the development of infrastructure to encourage the use of electric and low emission vehicles by including electric vehicle charging stations in new and substantially redeveloped public facilities and in public commercial areas, and revise regulations as technology advances.

**Policy CR-7.6 (Goal LU-6.10)**

Implement maximum automobile parking standards for various types of commercial development. Encourage Transportation Demand Management through shared parking facilities that complement hours of operation of different businesses.

**Policy CR-7.7 (Policy T-10.2)**

Require large employers to implement a CTR Program for employees, as mandated by the State Commute Trip Reduction Act. Encourage telework as part of the CTR strategies.

**NEW Goal CR-8: Prioritize public transportation and pedestrian and bicycle investments to reduce vehicle miles traveled per capita.**

**Policy CR-8.1 (Goal T-5)**

Encourage use of public transportation to accommodate a larger proportion of the traveling public.

***Policy CR-8.2 (Goal T-6)***

Develop facilities for pedestrians and bicyclists to achieve a walkable community to support active and independent living, health, environmental quality, and cost savings for travel.

***Policy CR-8.3 (Policy T-6.2)***

Develop a system of bicycle routes that connects neighborhoods and is coordinated with surrounding jurisdictions to allow people to conveniently travel between and within neighborhoods and local parks, mixed-use areas, and regional facilities.

***Policy CR-8.4 (Policy T-13.1)***

Identify gaps in bike lanes and sidewalks and opportunities for pathway and trail connections between neighborhoods to parks and schools to encourage greater pedestrian facility use and reduce reliance on automobiles. Support the construction of improvements to trail systems to provide connections between parks and neighborhoods for walkers and cyclists.

***Policy CR-8.5 (Goal LU-1.7)***

Encourage project designs to encourage access by modes of travel other than driving alone, such as walking, bicycling and transit, and to provide connections to the nonmotorized system.

**NEW Goal CR-9: Incentivize green buildings in Fircrest to go above and beyond state energy requirements.**

***Policy CR-9.1 (Policy LU-1.3)***

Encourage development of both public and private lands in Fircrest that provides long-term benefit to the community using techniques such as green building and green infrastructure. Incentivize green building techniques and certification for new development where possible and encourage retrofits to existing buildings to improve energy efficiency.

**NEW Policy CR-9.2**

Develop low-energy-use requirements and building code compliance for residential buildings, and consider the adoption of green building standards.

**NEW Policy CR-9.3**

Prioritize the adaptive reuse of buildings, recognizing the emission-reduction benefits of retaining existing buildings. (Also encouraged as a way to preserve historic properties with Policy CC-9.5).

**NEW Goal CR-10: Encourage density by utilizing form-based code and incentivizing ADUs and infill development.**

***Policy 10.1 (Policy CD-8.1)***

Periodically review and update form-based codes, design standards and guidelines, and other zoning provisions that apply to mixed-use development, multi-family redevelopment, and single-family infill housing to assess their effectiveness in accomplishing design objectives and community design goals, and to assess the extent to which they successfully respond to neighborhood compatibility issues and concerns.

***Policy CR-10.2 (Policy LU-1.5)***

Encourage infill development on suitable vacant parcels and redevelopment of underutilized parcels. Ensure that the height, bulk, and design of infill and redevelopment projects are supportive of the public realm and compatible with their surroundings.

***Policy CR-10.3 (Policy CD-4.1)***

Implement the adopted Form-Based Codes and design standards and guidelines to guide development. Consider adopting additional form-based codes that would apply to Neighborhood Commercial areas on Regents Boulevard and the City's medium- to high-density multi-family areas to achieve unique, high-quality built environments in each area.

***Policy CR-10.4 (Policy H-2.2)***

Encourage increased residential density in mixed-use and multi-family zones, especially those located within the Form-Based Code area, subject to compliance with appropriate form-based code standards and design guidelines. Prohibit new detached single-family development in these areas to promote more intensive use of mixed-use and multi-family properties.

***Policy CR-10.5 (Policy H-2.3)***

Facilitate development of accessory dwelling units (ADUs) and duplexes in conjunction with single-family attached structures, to promote housing choice and opportunities to age in place.



# APPENDIX G: CLIMATE RESILIENCE

## List of Figures

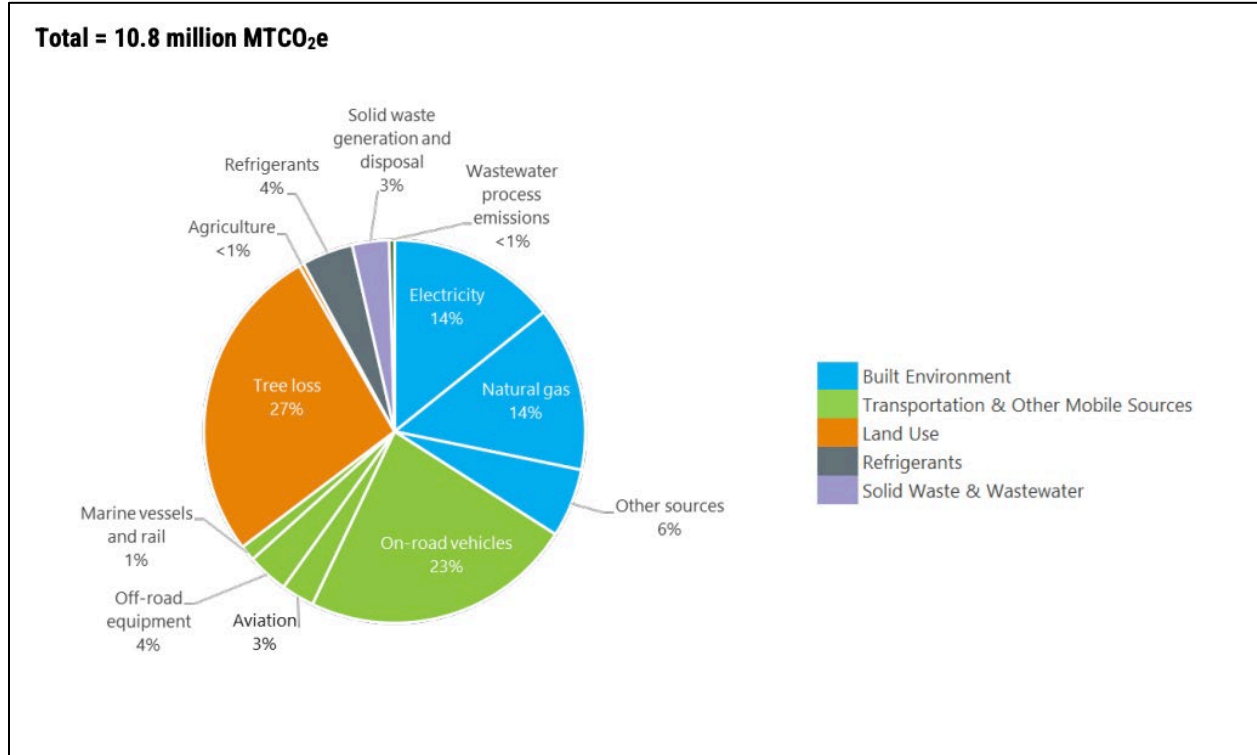
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## GREENHOUSE GAS EMISSIONS

Fircrest’s incorporation of climate mitigation or adaptation efforts in the Comprehensive Plan should correspond to regional and statewide goals. Pierce County’s Greenhouse Gas Reduction Plan, as aligned with statewide goals, includes an emissions reduction target of 45% by 2030. Pierce County’s climate goals include strategies to address five broad categories: Energy and Built Environment, Transportation, Consumption and Waste Reduction, Carbon Sequestration, and Education and Outreach.

### EMISSIONS PROFILE

The City of Fircrest does not have an existing emissions profile or climate action plan. Countywide emissions for Pierce County are shown in Figure 1. Emissions in Pierce County are primarily derived from the built environment and transportation, which make up 34% and 31%, respectively. Other emissions sources include land use (specifically from tree loss), refrigerants, and solid waste and wastewater. Per capita emissions in Pierce County are 12.2MT CO<sub>2</sub>e/year as of 2019, which is lower than statewide per capita emissions of 13.5 MY in 2019.

**Figure 1 Pierce County 2019 Emissions Profile**

Source: Pierce County Communitywide Geographic Greenhouse Gas Emissions.

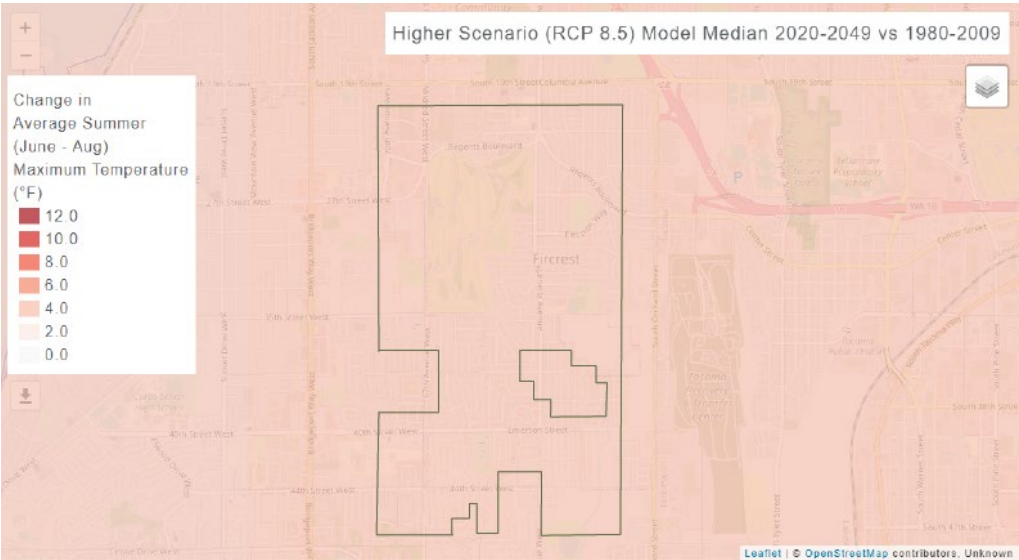
## CLIMATE IMPACTS

### Climate Hazards

Climate impacts expected to affect the region at large are more frequent and intense heat waves, increased precipitation, and increased flooding risks, among others. Fircrest is predicted to experience warmer summers, with an average increase of 4°F in maximum summer temperatures by 2050 (Figure 2).

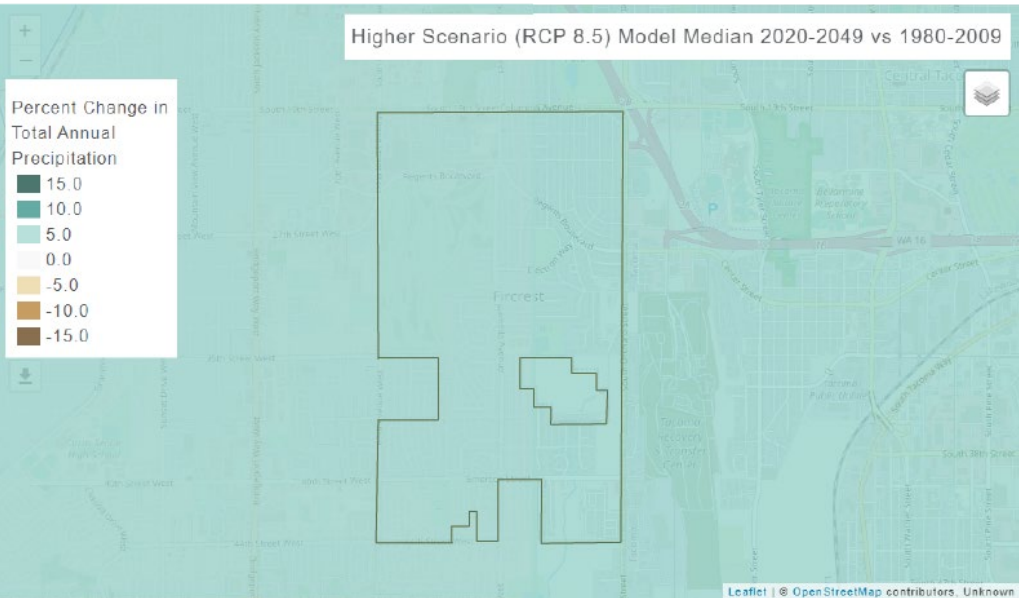
Annual precipitation is predicted to increase by about 5% over the next 30 years as compared to the average precipitation from 1980-2009. However, summer precipitation will decrease in Fircrest over the same period; there is a 35-40% chance that any year in the next 30 years will have at least 75% less precipitation than historical normal values (Figure 3Figure 3).

**Figure 2 Change in Average Summer Temperature by 2050**



Source: Climate Impacts Group, Climate Mapping for a Resilient Washington Tool

**Figure 3 Percent Change in Total Annual Precipitation**

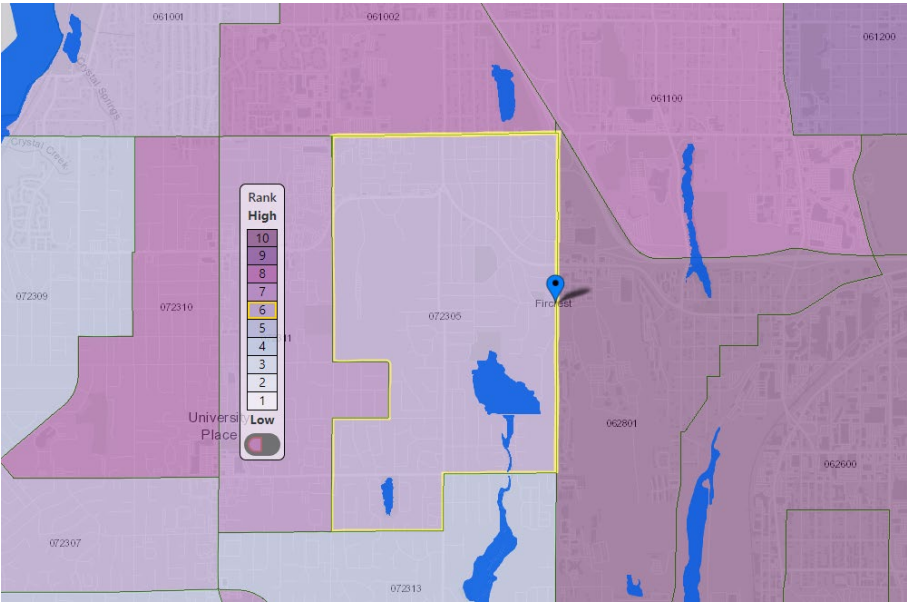


Source: Climate Impacts Group, Climate Mapping for a Resilient Washington Tool

CLIMATE VULNERABILITY ASSESSMENT

Vulnerability to climate hazards in Fircrest is relatively low compared to surrounding census tracts, with an overall vulnerability index of 6/10 according to the Washington Environmental Health Disparities Map, as shown in Figure 4 below.

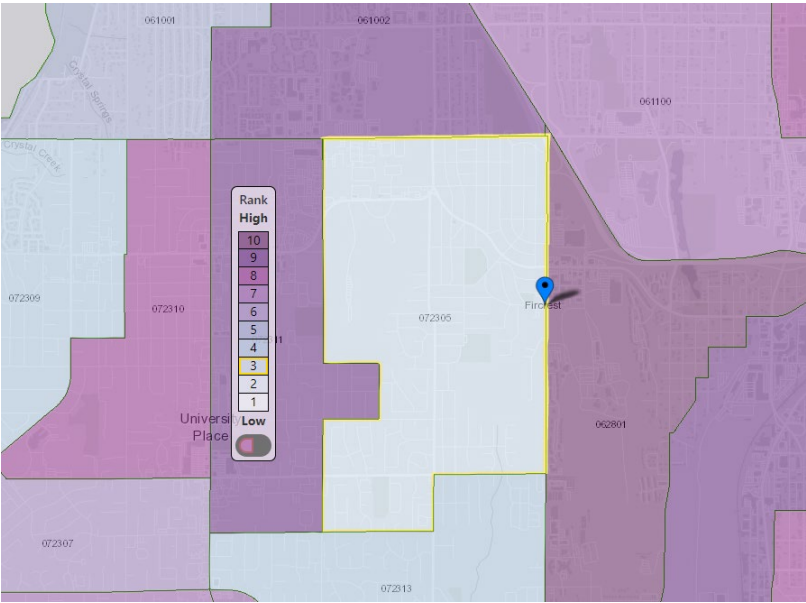
**Figure 4 Environmental Health Disparities Map Overview**



Source: Washington Environmental Health Disparities Map.

Fircrest has a low social vulnerability index of 3/10 compared to surrounding tracts, though there are a few communities that are most vulnerable (Figure 5). Such populations are households with a single parent (9/10), and those over 65 and under 18 (7/10 for both). Other vulnerable communities in Fircrest are those who are unemployed (7/10) or are living in poverty (6/10).

**Figure 5 Social Vulnerability Index**

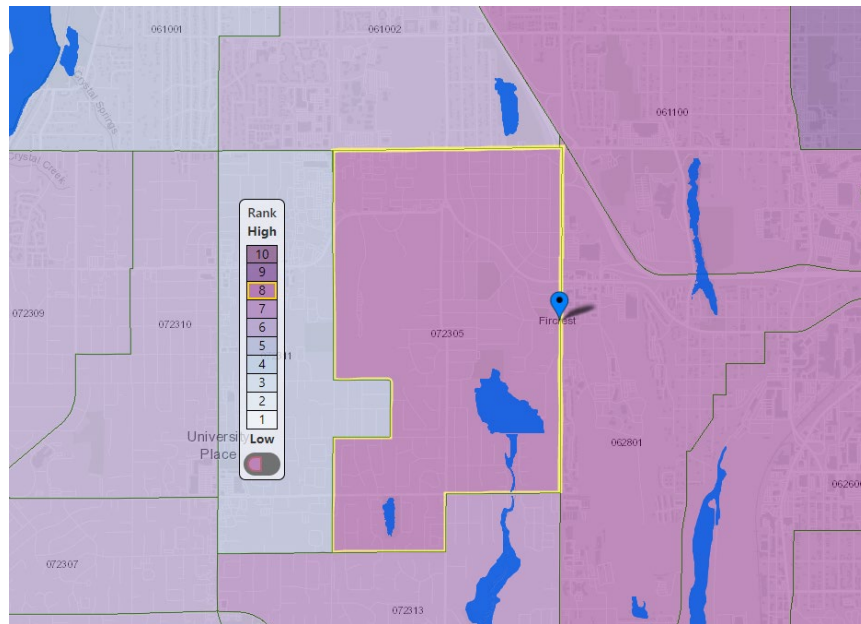


Source: Washington Environmental Health Disparities Map.



Vulnerabilities from environmental effects are relatively high among surrounding census tracts, perhaps due to its proximity to industrial activity in Tacoma. Vulnerabilities from environmental effects (Figure 6) stem from the proximity to superfund sites, risk management plan facilities, hazardous waste facilities, heavy traffic roadways, and the presence of air pollutants and lead in some housing (8/10).

**Figure 6 Environmental Effects and Hazards**



Source: Washington Environmental Health Disparities Map.

Vulnerable populations in Fircrest could be defined with greater spatial detail to ensure these communities don't disproportionately experience climate impacts. Overall, Fircrest's vulnerability is low compared to surrounding census tracts, but the populations identified in this brief analysis will need to be prioritized for climate action and preparedness efforts.