



Bellevue Planning Commission

October 11, 2023

PLANNING COMMISSION AGENDA ITEM

SUBJECT

Bellevue Climate Vulnerability Assessment

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POLICY ISSUES

Comprehensive Plan policy EN-7. *Develop and implement climate change adaptation strategies that create a more resilient community by addressing the impacts of climate change to public health and safety, the economy, public and private infrastructure, water resources, and habitat.*

In December 2020, Council adopted the 2021-2025 Sustainable Bellevue Environmental Stewardship Plan (ESP), which outlines a suite of 78 actions to reduce greenhouse gas emissions, enhance the natural environment in Bellevue, improve livability, and prepare for climate change. The 2021-2023 Council Vision & Priorities includes Priority #8: Implement the Environmental Stewardship Plan. The ESP includes Strategy C.1. *Mitigate emissions and plan for the long-term impacts of climate change.* The first action item within that strategy is C.1.1 Climate vulnerability assessment. *Perform a climate vulnerability assessment to understand long-term risks and vulnerabilities associated with climate change and identify next steps in terms of enhancing resiliency.*

DIRECTION NEEDED FROM THE PLANNING COMMISSION

ACTION

DIRECTION

INFORMATION ONLY

Staff will provide an update to the Planning Commission on the Bellevue Climate Vulnerability Assessment (CVA), including key findings related to climate impacts, local vulnerabilities, and next steps for enhancing resiliency. This presentation is for information only.

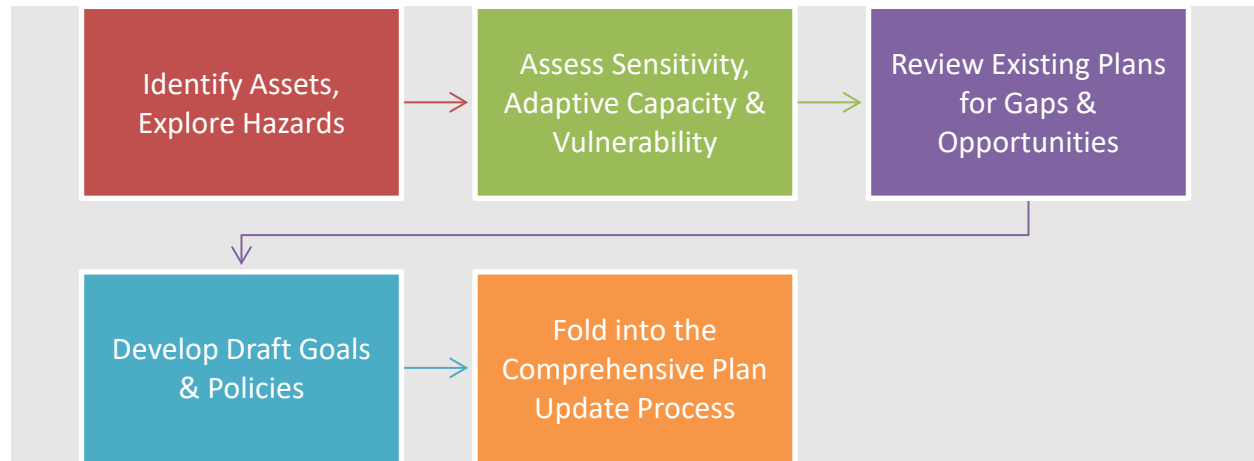
BACKGROUND/ANALYSIS

Bellevue received a grant to prepare its CVA from the Washington State Department of Commerce (Commerce) as part of the Comprehensive Plan Periodic Update (CPPU). This assessment will help the City respond to new legislation (HB 1181 Climate and Comprehensive Planning), which amended the Growth Management Act, chapter 36.70A RCW (GMA), to require a climate change element as part of a comprehensive plan. If funds are appropriated, then the GMA would require Bellevue to include this climate change element as part of its first implementation progress report in 2029. To address the requirements of the legislation, the climate change element can be a new element or incorporated into

the existing Environment Element of the Comprehensive Plan, and it must address both greenhouse gas emissions reduction (mitigation) and climate resilience (adaptation).

In coordination with other State agencies, Commerce developed a Draft Model Climate Element with resilience planning guidance, as well as a preliminary suite of measures (actions), to illustrate how cities can develop and implement plans, goals, and policies that build communitywide climate resilience. The Draft Model Climate Element was used as a framework for the CVA, and the preliminary measures were evaluated. Some of those measures are included in the report’s list of resilience strategies.

Resilience Sub-Element Development Process (Commerce Draft Model Climate Element)



SOURCE: Washington State Department of Commerce 2023

In addition to specific strategies that the City could enact, the CVA also includes recommendations for a number of proposed new policies, and modifications to existing policies, for potential inclusion in the CPPU. The ESI team is currently reviewing these CPPU policy recommendations to identify and address gaps in responding to Comprehensive Plan policy EN-7. Most of the CVA’s policy recommendations would modify the Environment Element, but some would be integrated into other elements. Staff are evaluating these climate change and climate resilience policy recommendations as part of the overall process by which Bellevue planning staff is evaluating all proposed CPPU policy modifications, with input from subject matter experts, stakeholders, and commissions.

The CVA findings will also be considered in relation to FEIS mitigation measures, as there are points of overlap between the two; although for the most part, FEIS mitigation measures are broader than the CVA findings and recommendation, which tend to be more specific and focused on climate resiliency. It should be noted that the main climate impacts and vulnerabilities identified in the report were present in all of the EIS growth alternatives.

Climate Vulnerability Assessment Scope & Analysis

The Climate Vulnerability Assessment includes a summary of regional climate trends, an analysis of the potential impacts, adaptative capacity, and vulnerabilities for the following sectors:

- Buildings and Energy
- Cultural Resources and Practices

- Economic Development
- Ecosystems
- Emergency Management
- Human Health
- Land Use and Development
- Transportation
- Utilities (Solid Waste, Wastewater, and Stormwater)
- Water Resources

Regional Climate Trends and Primary Climate Impacts

Like the region as a whole, Bellevue is experiencing worsening and accelerating impacts from global climate change. The CVA identifies impacts of particular concern for Bellevue using regional data from the University of Washington Climate Impacts Group and the U.S. Environmental Protection Agency. By 2050, King County is projected to experience the following impacts:

Air Temperature/Extreme Heat:

- Average summer temperature increase by 6.3-degrees Fahrenheit;
- Increasingly frequent and severe extreme heat events, expected to occur at an average increase of 20.1 days above 90-degree humidex (an indicator of combined heat and humidity, at a level that is dangerous to human health);

Extreme Precipitation/Flooding:

- Increasing extreme precipitation events, particularly during the winter months, leading to:
- Increasingly frequent and severe flooding, erosion, and landslide risk;

Stream Impacts:

- Increasing water temperatures in streams and lakes;
- More frequent extremes in streamflow lengths compared to historical averages;

Drought:

- Increasingly frequent and intense periods of summer drought (defined as summer precipitation below 75 percent of normal compared to the historical average);

Wildfire:

- Increase in fire danger days by an average of 10 high-fire days per year (of concern for homes and businesses in Bellevue's wildland-urban interface, but of lower concern for the City as a whole);
- More frequent smoke events from regional wildfires, leading to poor air quality.

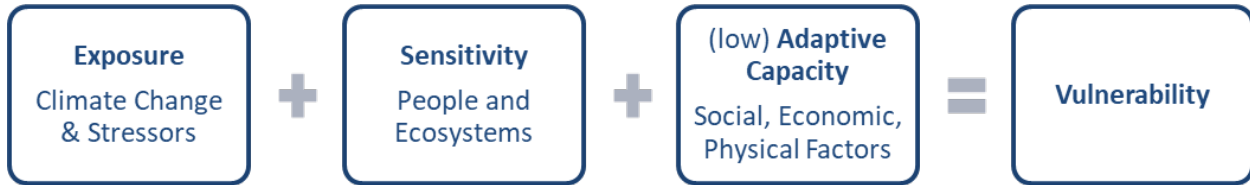
Summary of Vulnerability

The CVA measures vulnerability using three factors: exposure to climate change impacts, sensitivity to those impacts, and adaptive capacity.

- **Exposure** is determined by the extent of climate impacts a community or sector experiences;
- **Sensitivity** is the degree to which the community or sector is affected by the impacts it is exposed to;

- **Adaptive capacity** is the ability of a community or sector to mitigate or cope with climate impacts.

Vulnerability is highest when exposure and sensitivity are high, and adaptive capacity is low.



Given its relatively small geographic size, exposure to climate impacts is generally similar throughout Bellevue. However, the varying sensitivity and adaptive capacity of different sectors and groups results in differential vulnerability to climate change. Climate impacts interact with other social stressors and economic factors that contribute to greater underlying vulnerability. Groups more vulnerable to climate impacts include older people, children, low-income families, immigrant communities, and Black, Indigenous, and people of color (BIPOC) individuals. Residents from historically disadvantaged communities may also be more likely to live in the City’s “heat islands”- areas with more pavement and less tree canopy where climate impacts like extreme heat are magnified.

To determine where vulnerability is highest in Bellevue, the CVA consultant team developed a Bellevue Climate Vulnerability Index (CVI). The CVI, which uses over 30 indicators to create an index of climate vulnerability. The indicators include exposure to climate impacts as well as elements of social vulnerability, to identify areas of the City with greater overall vulnerability to climate change impacts. A full description of the CVI and its indicators can be found in Section 2.2 of the report, (Attachment A).

Figure 1 and Figure 2 show the results of Bellevue’s CVI and the areas of the City where vulnerability is expected to be highest. These maps are meant to compare different areas in Bellevue to each other—the index is not a comparison of climate vulnerability in Bellevue relative to the rest of the county. The CVI provides a high-level picture of vulnerability differences across the City that can be used to inform planning decisions (Figure 1). In Figure 1, which does not take into account population density, the more vulnerable areas in Bellevue have lower tree canopy, higher urban heat island and in some cases are at higher risk of flooding.

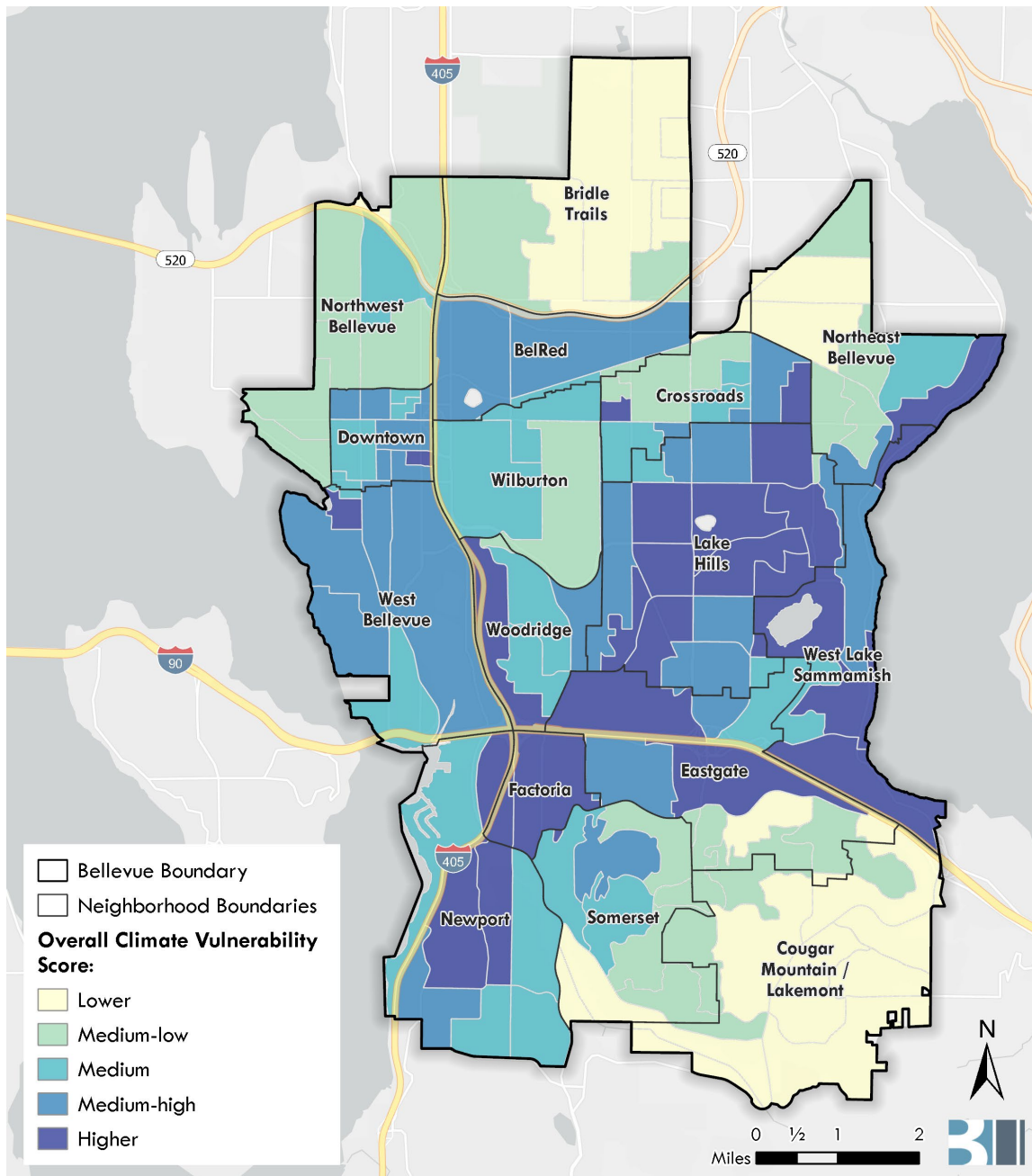


Figure 1: Climate Vulnerability without Population Density, (BERK, 2023)

In Figure 2, which does account for population density, the areas around Lake Hills, Crossroads, Downtown, and Factoria have relatively higher vulnerabilities to climate impacts, due to their sensitivity around heat and higher frequency and intensity of storms.

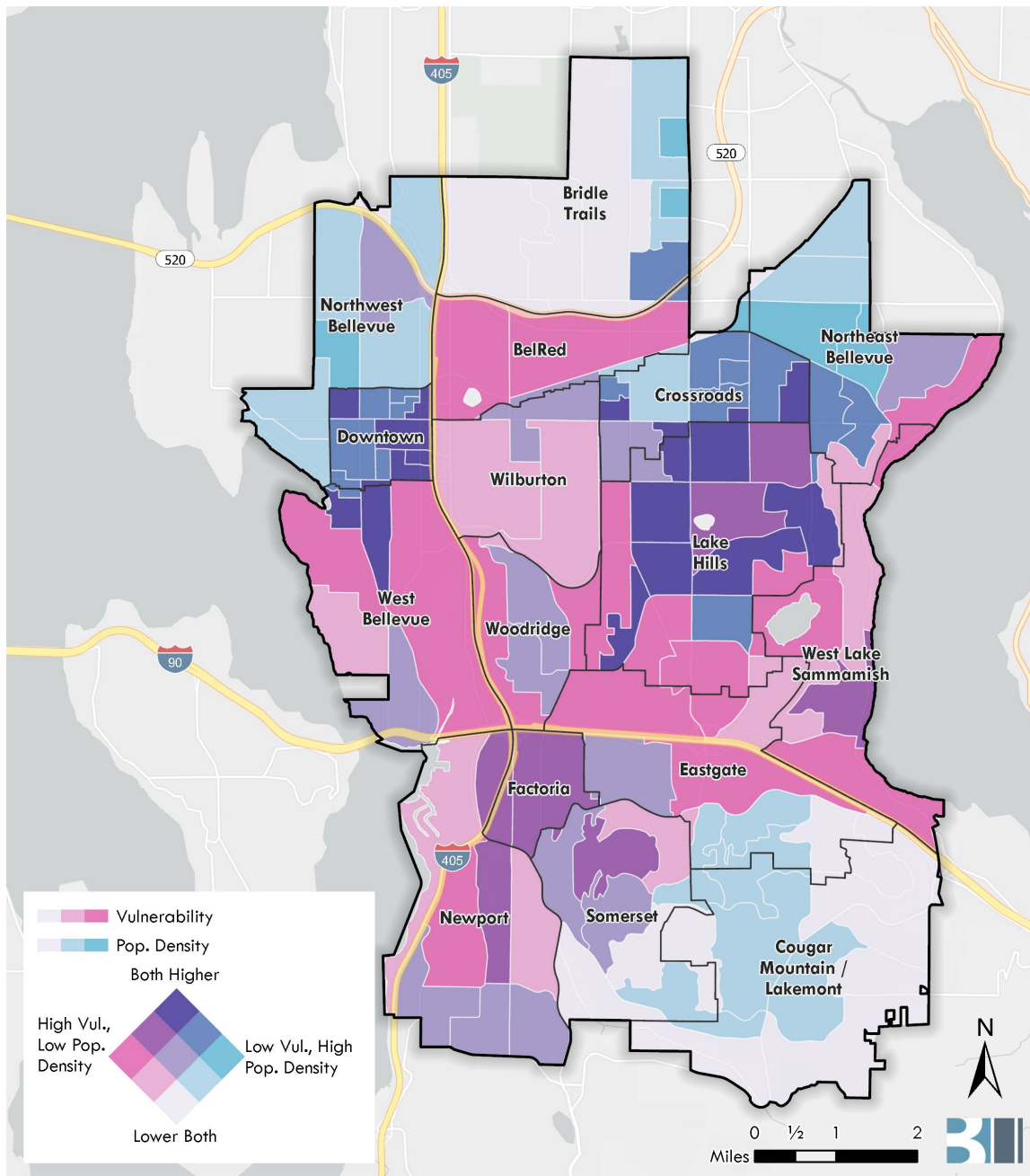


Figure 2: Climate Vulnerability with Current Population Density (BERK, 2023)

Overview of Findings

Overall, the CVA found the City to have moderate to high vulnerability to climate change. Detailed assessments of each sector’s vulnerability can be found in Section 3 of the full report (Attachment A). Table 1 provides a high-level summary of the impacts expected to be of moderate and/or high concern for each sector; the average adaptive capacity of the sector; and an assessment (on a scale of low-high) of the overall vulnerability of each sector.

Table 1: Vulnerability Summary by Sector

Sector	Impact Categories of Moderate- and/or High Concern	Adaptive Capacity (Low, Moderate, High)	Vulnerability (Low, Moderate, High)
Buildings & Energy	Air Temperature/Extreme Heat; Extreme Precipitation/Flooding; Drought	Moderate	Moderate-High
Cultural Resources & Practices	Air Temperature/Extreme Heat; Extreme Precipitation/Flooding; Stream Temperature; Drought; Wildfire Smoke	Moderate	Moderate-High
Economic Development	Air Temperature/Extreme Heat; Extreme Precipitation/Flooding; Wildfire Smoke	Low-Moderate	Moderate-High
Ecosystems	Air Temperature/Extreme Heat; Extreme Precipitation/Flooding; Stream Temperature; Drought	Low-Moderate	Moderate-High
Emergency Management	Air Temperature/Extreme Heat; Extreme Precipitation/Flooding; Wildfire and Wildfire Smoke	Moderate	Moderate
Human Health	Air Temperature/Extreme Heat; Extreme Precipitation/Flooding; Wildfire Smoke	Moderate	High
Transportation	Air Temperature/Extreme Heat; Extreme Precipitation/Flooding; Drought	Low-Moderate	Moderate
Waste Management	Air Temperature/Extreme Heat; Extreme Precipitation/Flooding	Low-Moderate	Moderate-High
Water Resources	Air Temperature/Extreme Heat; Extreme Precipitation/Flooding; Stream Temperature; Drought; Wildfire and Wildfire Smoke	Low-Moderate	Moderate
Land Use & Development	Air Temperature/Extreme Heat; Extreme Precipitation/Flooding	Moderate	Moderate

The CVA also includes a discussion of possible strategies for increasing resilience in each sector. Many of these strategies are already actions the City is taking, such as planting trees in neighborhoods with lower tree canopy and implementing more low impact development projects to help manage stormwater. The consultant team also performed an initial review of Comprehensive Plan policies and recommended some potential edits to further incorporate climate resiliency into the Comprehensive Plan. These suggested policies are being reviewed and will be incorporated as appropriate and relevant into the draft updated policies. Staff are not seeking direction on these suggested policy edits at this point, as they will require further review and vetting and will be reviewed by the Planning Commission as part of the CPPU process.

Next Steps

The report has identified possible next steps for leveraging the CVA findings and recommendations to continue integrating climate change and resilience into City policies, programs, and projects. Next steps include:

- Share CVA results with the community at the Sustainable Bellevue Lunch and Learn on October 17 and through upcoming outreach and engagement for the CPPU.
- Review suggested strategies and identify priority actions for implementation, based on vulnerabilities and capacities identified in this report and engage with the community and organizational stakeholders.
- Inform the Comprehensive Plan Periodic Update, mainly through policy recommendations intended to further integrate climate change and resilience into the CPPU (see Appendix 1 of CVA),
- Identify opportunities to integrate report findings into upcoming plan updates, including:
 - Sustainable Bellevue Environmental Stewardship Plan update (2025);
 - Comprehensive Emergency Management Plan update, including the Hazard and Inventory Risk Assessment (2025); and
 - Other functional plans as relevant.
- Conduct a Climate Risk and Resilience Assessment for City-owned buildings and facilities.
- Evaluate creating an interdepartmental Climate Preparedness Team and collaborate with other regional climate preparedness efforts, such as the Puget Sound Climate Preparedness Collaborative.
- Partner with Emergency Services staff and stakeholders to conduct a Resilience Hub Gap Analysis (use the Resilience Hub model to identify opportunities within existing Emergency Services centers and programming, including in support for / partnership with community centers and organizations).
- Provide training to City staff in implementing climate-resilient best practices for capital project design and construction, such as through the Institute of Sustainable Infrastructure (ISI) Envision framework.
- Identify opportunities and models for community engagement programs specific to vulnerable groups identified in this report, including partnership opportunities through existing programs, to help strengthen resilience for those most likely to be impacted by climate change.

ATTACHMENT

A. Bellevue Climate Vulnerability Assessment

REFERENCE MATERIALS

Sustainable Bellevue, Environmental Stewardship Plan, 2021-2025