



# CLIMATE CHANGE VULNERABILITY ASSESSMENT FOR BELLEVUE

CITY OF BELLEVUE PROJECT LEADS Jennifer Ewing, Community Development;  
Brian Landau, Utilities  
UNIVERSITY OF WASHINGTON INSTRUCTOR Bob Freitag, Urban Design and Planning  
URBDP 549, Hazard Mitigation Planning



## THE CHALLENGE

Bellevue anticipates great change in coming years and decades as a result of factors tied to population growth and climate change. Uncertainty and potentially catastrophic consequences related to the compounding effects of increased urbanization and climate change are important for the City of Bellevue to evaluate and incorporate into long-term planning. Our class considered three topics of particular concern and interest to the City of Bellevue:

- The role of the city's urban tree canopy culturally and aesthetically, and its potential to provide some resilience to hotter temperatures and more frequent and intense storms
- The vulnerability induced by rapid urban development and more frequent and intense storms
- The tangible effects of climate change on the well-being of current and future residents of Bellevue

We applied scenario planning to each topic to see how changes in precipitation and heat interact with urban systems. In our report, we:

- Considered a multitude of potential outcomes of population growth and climate change
- Presented various mitigation strategies and solutions
- Indicated where future study can be directed to prepare Bellevue for the future

## OUR METHODS

Scenario planning is a systematic method for envisioning potential outcomes produced by complex and uncertain factors set in the future (Peterson, et al. 2003). Each scenario is the result of plausible events and environmental drivers, and would require different courses of action and strategic decision-making in response (Wilburn 2011). Thus, scenario planning serves as a useful tool for planners to envision possible, probable, or plausible future outcomes of climate change and urbanization. Each scenario provides a lens through which planners can view possible future events and conceptualize plans and course of action accordingly.

## OUR RECOMMENDATIONS

Building resilience to climate change while accommodating anticipated urban growth and development must be considered together. Climate change will not only stress the city's built environment and urban tree canopy, but it will physically and emotionally stress the residents of Bellevue. The approaches and tools recommended in this report address likely scenarios in the future, and offer starting points for the City to consider as mitigation strategies and solutions. They include:

- Retrofitting aging development
- Expanding the use of low impact development
- Designing onsite water detention features in up-zoned areas
- Creating a comprehensive tree inventory
- Establishing a regional urban tree canopy climate stressor research organization
- Assisting species migration
- Providing people refuge in shelters
- Promoting mixed-use, dispersed social infrastructure

To cultivate equity and resilience, Bellevue may dedicate resources to studying future potential scenarios in greater depth, and develop an action plan to include many of our recommendations.



The LCY research team visits Weowna Park with Project Leads Jennifer Ewing and Brian Landau on February 1, 2019. With climate change and further development, Weowna Park could be reshaped or flooded.  
TERI THOMSON RANDALL

Lower summer warning scenario	Moderate summer warning scenario	Highest summer warning scenario
The greater Seattle area can expect 68 excess deaths in 2025, 89 excess deaths in 2045, and 107 excess deaths in 2085	The greater Seattle area can expect 101 excess deaths in 2025, 156 excess deaths in 2045, and 280 excess deaths in 2085	The greater Seattle area can expect 211 excess deaths in 2025, 401 excess deaths in 2045, and 988 excess deaths in 2085

Excess death from all non-traumatic causes among persons 45 years of age or older in the greater Seattle area under climate warming scenarios for the years 2025, 2045, and 2085. LCY STUDENT TEAM

