APPENDIX G: CLIMATE RISK ASSESSMENT

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G.1 BACKGROUND

Following the Washington State Department of Commerce's Climate Element Planning Guidance document, the City of Leavenworth conducted a vulnerability and risk assessment to assess the impacts of climate change exacerbated hazards on City assets. All results of the planning process are documented within the Climate Element Workbook, including the assessment of climate impacts, review of existing plans and policies, and climate change vulnerabilities in Leavenworth. This appendix describes the planning process, data sources, results of the risk and vulnerability assessment, and the resilient goals and policies within the Comprehensive Plan.

This effort is supported with funding from Washington's Climate Commitment Act. The CCA supports Washington's climate action efforts by putting cap-and-invest dollars to work reducing climate pollution, creating jobs, and improving public health. Information about the CCA is available at www.climate.wa.gov.

KEY DEFINITIONS

Resilience - Resilience refers to the capacity of various systems—whether individuals, ecosystems, cities, or economies—to adapt to change while maintaining functionality. Advocating for resilience acknowledges the inevitability of change. With appropriate planning and policy decisions in place, both built and natural systems have the potential to recover effectively when disruptions occur.

Mitigation - Mitigation is a sustained action to minimize long-term risk.

Adaptation - Adaptation involves modifying human behaviors and systems to lessen or prevent the impacts of future conditions that are likely to persist, despite ongoing mitigation efforts.

Vulnerability - Vulnerability is defined as a combination of exposure, sensitivity, and adaptive capacity. Assessments regarding vulnerability have been conducted across various sectors, including transportation, land use and agriculture, freshwater systems, and ecosystems and species.

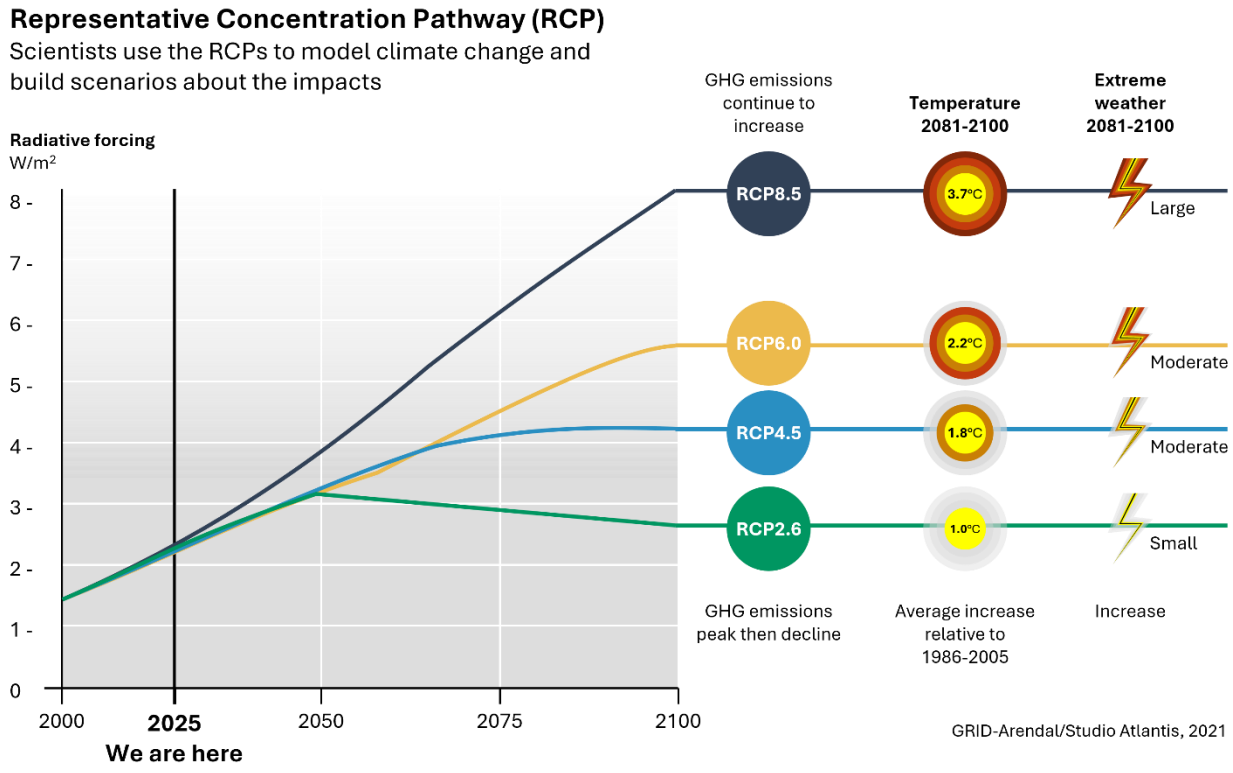
Risk - Risk refers to the potential adverse effects of future conditions on the environment, economy, and society. It encompasses both physical risks, such as extreme weather events, and transition risks, including changes in policy and regulations.

CLIMATE CHANGE SCENARIOS

The Leavenworth Climate Advisory Team supported the identification of assets to be evaluated in the assessment. The assets were evaluated against hazards including drought and snowpack decline, extreme temperatures, extreme precipitation and flooding, and wildfire smoke.

Climate hazards, indicators, and impacts specific to Leavenworth were identified using the Climate Mapping for a Resilient Washington ("CMRW") webtool. The CMRW tool provided a long list of climate indicators across 11 sectors, including agriculture, buildings and energy, cultural resources and practices, economic development, ecosystems, emergency management, human health, transportation, waste management, water resources, and zoning and development. The assessment used the higher greenhouse gas scenario (RCP 8.5) as compared to the lower greenhouse gas scenario (RCP 4.5) as the scenarios do not differ significantly prior to 2050. See for an illustration of the different scenario pathways. The expectation is that this data will be refreshed in future Comprehensive Plan updates, with assessment results updated accordingly.

Exhibit 1: Representative Concentration Pathways



DATA SOURCES

UW Climate Mapping for a Resilient Washington: A climate projections database, built by the UW Climate Impacts Group, used to build baseline awareness of how climate change is expected to affect Leavenworth (water resources, transportation, etc.) and its social, economic, and environmental assets in coming decades. The Department of Commerce considers the CMRW webtool a source of best-available science and scientifically credible projections (Raymond & Rogers, 2022). https://cig.uw.edu/resources/analysis-tools/climate-mapping-for-a-resilient-washington/

Climate Toolbox: A collection of web tools for visualizing past and projected climate and hydrology of the contiguous United States. Used to identify divergent climate future scenarios relevant to a region and resource management, and to extract quantitative climate summaries, spatial, and time series data for applications related to climate change vulnerability assessments and scenario planning. https://climatetoolbox.org/

Washington Department of Health Environmental Health Disparities Map: The Environmental Health Disparities map is a collage of lived experiences across Washington. It compares communities using census tracts to identify disparities. Using the EHD map can determine where more attention needs to be paid to address and reduce the specific pollution, societal, and health harms affecting Washington residents. https://experience.arcgis.com/experience/d133fa97a3854f8eac905ec152f16b05/

NOAA National Centers for Environmental Information: NOAA NCEI provides access to an extensive archive of environmental data through several platforms. It provides climate, coastal, oceanographic, and geophysical data in a variety of formats. https://www.ncei.noaa.gov/

FEMA National Risk Index: The National Risk Index is a dataset and online tool to help illustrate the United States communities most at risk for 18 natural hazards. It was designed and built by FEMA in close collaboration with various stakeholders and partners in academia; local, state and federal government; and private industry. https://www.fema.gov/emergency-managers/practitioners/resilience-analysis-and-planning-tool

Western Regional Climate Center: The WRCC acts as a repository for high-quality historical climate data and information for the western U.S., a region covering the eleven westernmost states, including Alaska, Hawaii, and the U.S. https://wrcc.dri.edu/

CDC Social Vulnerability Index: The Centers for Disease Control and Prevention and Agency for Toxic Substances and Disease Registry Social Vulnerability Index is a place-based index, database, and mapping application designed to identify and quantify communities experiencing social vulnerability. https://www.atsdr.cdc.gov/place-health/php/svi/svi-interactive-map.html

- **First Street:** A platform that assesses and quantifies climate risk, particularly focusing on flooding, wildfire, and other climate hazards for properties globally. It provides data and tools for individuals, businesses, and governments to understand and manage climate-related financial risks. https://firststreet.org/

- **Wildfire Risk to Communities:** A free resource created by the USDA Forest Service to help communities understand, explore, and reduce wildfire risk. It provides interactive maps, charts, and tools to help community leaders, such as elected officials, planners, and fire managers, assess and address wildfire risk. The website was last updated in May 2024. https://wildfirerisk.org/

- **2024 Chelan County Hazard Mitigation Plan (HMP) – Leavenworth Annex:** The HMP is a comprehensive document that identifies natural hazards, assesses potential risks, and outlines strategies to mitigate and respond to hazard events within the county. It was approved by FEMA on December 6, 2024. https://www.co.chelan.wa.us/natural-resources/pages/natural-hazard-mitigation-plan

- **2025 Chelan County Community Wildfire Protection Plan (CWPP):** The CWPP is a comprehensive document that assesses wildfire risk, identifies areas for risk reduction, and outlines mitigation strategies for Chelan County and its communities, including Leavenworth. It was adopted by the Board of County Commissioners on March 31, 2025. https://www.co.chelan.wa.us/natural-resources/pages/natural-hazard-mitigation-plan

G.2 CLIMATE HAZARDS

More detailed information about climate hazards and their future impacts on Leavenworth can be found within the Climate Resilience Element. The information below is intended to establish a basis for the risk assessment that was conducted as part of the climate planning process.

SEVERE STORMS

Severe storms are not typically included in long-term climate change assessments, but they can amplify climate impacts and have real consequences for communities like Leavenworth. Severe storms involve a combination of hazards that occur sequentially or concurrently. For example, during cooler months, atmospheric rivers (e.g., the Pineapple Express) bring intense rainfall and strong winds. Severe storms during the warmer months may include a combination of high temperatures and high wind speeds, or dry lightning, creating what is referred to as fire weather. Most recently, a catastrophic winter storm in December 2025 brought record rainfall and high winds that caused flooding, private property damage from downed trees, and extended power outages in Chelan County.

Exhibit 2. Severe Storm Change Summary

Historical conditions	Projected changes
• December 2025: A combination of heavy rains followed by extreme winds led to widespread structural damage, loss of power and communications, and directly impacted holiday tourism • January 2022: Snowmaggedon event that brought significant snowfall in 24 hours and shut residents inside their homes • January 1996: Flooding during a severe storm	• According to NASA, atmospheric rivers will be, on average, about 25% wider and longer, and the global frequency of heavy rain and strong winds will increase by about 50% (Smith, 2018) • Atmospheric rivers will become moister and rainier, and more hazardous to communities in the future (Henny & Kim, 2025) • The warming Polar Vortex will continue to affect the Jet Stream, pushing cold air south

EXTREME TEMPERATURES

Extreme temperatures include conditions at both ends of the temperature spectrum. High-temperature extremes occur when daily maximums significantly exceed seasonal norms—typically temperatures reaching the upper 90s or surpassing 100°F. These conditions are somewhat new for Leavenworth (see Exhibit 3), where high highs are historically uncommon. In recent years, these heat events have become more frequent and longer lasting.

Cold-temperature extremes occur when Arctic air masses penetrate the region or when disruptions to the polar vortex direct frigid air southward. While Leavenworth experiences regular winter cold, these extreme events produce temperatures substantially below seasonal averages, occasionally dropping below 0°F. Arctic intrusions can compromise critical infrastructure, freeze water systems, overwhelm heating capacity, and create hazardous conditions. These events are particularly problematic when they occur during shoulder seasons (early fall or late spring) when preparedness measures may not be fully in place.

Exhibit 3: Days with ≥90°F Feels-Like Temperature

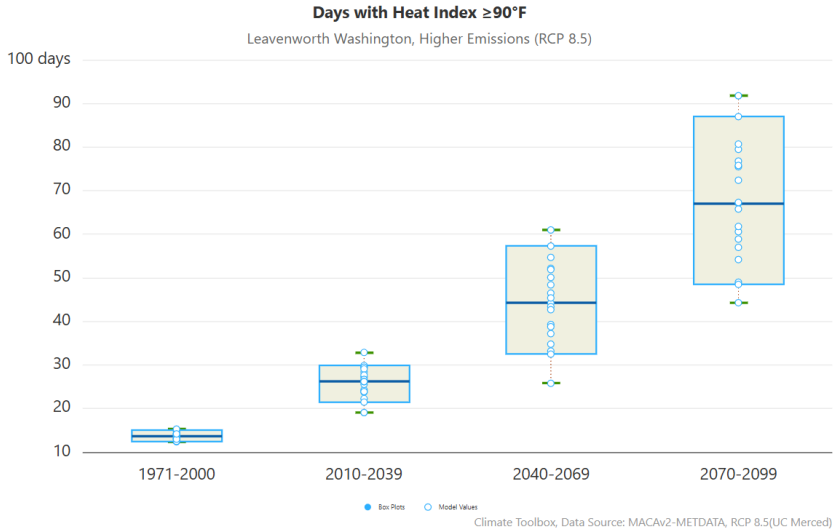


Exhibit 4. Extreme Temperature Summary

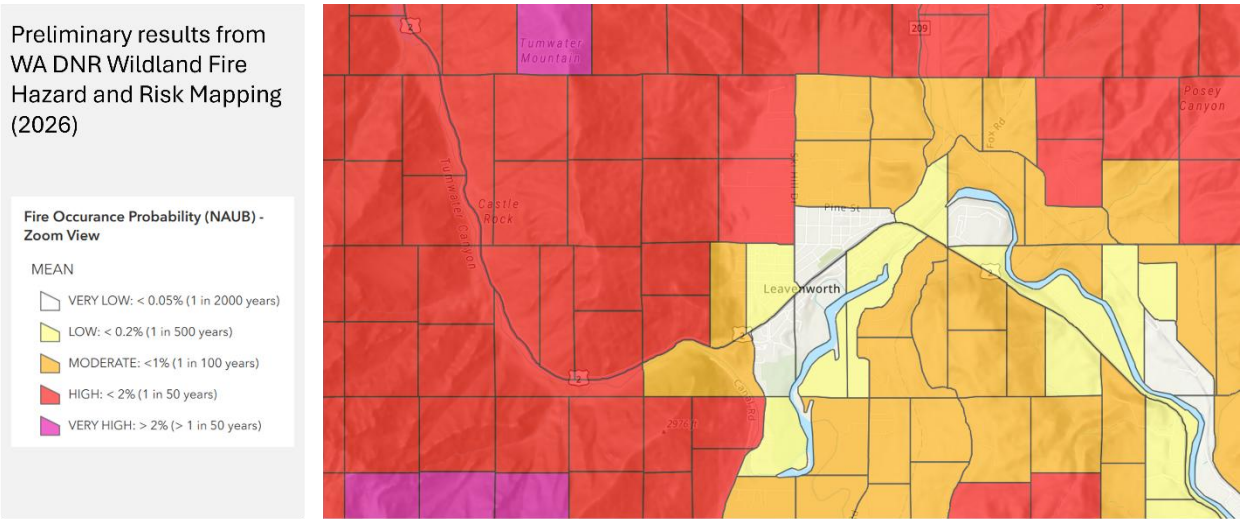
Historical conditions	Projected changes
• January 2024: Arctic Blast that brought freezing temperatures • July 2024: Three-day heatwave the weekend of the 4th of July • August 2022: Heat wave with highs in the 90-95°F range was predicted for a weekend in early August, with low humidity • June 2021: Historic "heat dome" event caused extreme, record-breaking temperatures across the entire state and 109°F temperatures in Leavenworth	According to UW Climate Impacts Group, RCP8.5 2020-2049: • Up to 4°F increase in summer maximum temperatures • Up to a week more of hot days above 90°F • Up to 20 more days with a 90°F "feels like" temperature • Significantly fewer warming degree days (use of heating) • Likelihood of a 3-day heatwave increases from 63% to 87% • Shifts in the timing of seasonal change

WILDFIRE AND SMOKE

Changes in the climate contribute to wildfires by creating hotter, drier conditions that are conducive to ignition and rapid spread, resulting in greater amounts of smoke that can be carried over long distances. Wildfire smoke is already part of life in Leavenworth, averaging over 50 smoky days each year (Saldanha, 2021). As the number and frequency of wildfires increases, the number of smoke days will rise as well. The length of fire season is also changing, beginning earlier in the year and lasting for longer.

An immediate threat to Leavenworth is ember cast, where embers from a fire are carried by the wind and start new fires ahead of the main fire front. According to Washington State DNR, wildfire risk surrounding Leavenworth is high today, and with worsening snowpack and drought conditions, this risk is expected to remain high.

Exhibit 5: New Draft Wildfire Hazard Map (WA DNR)

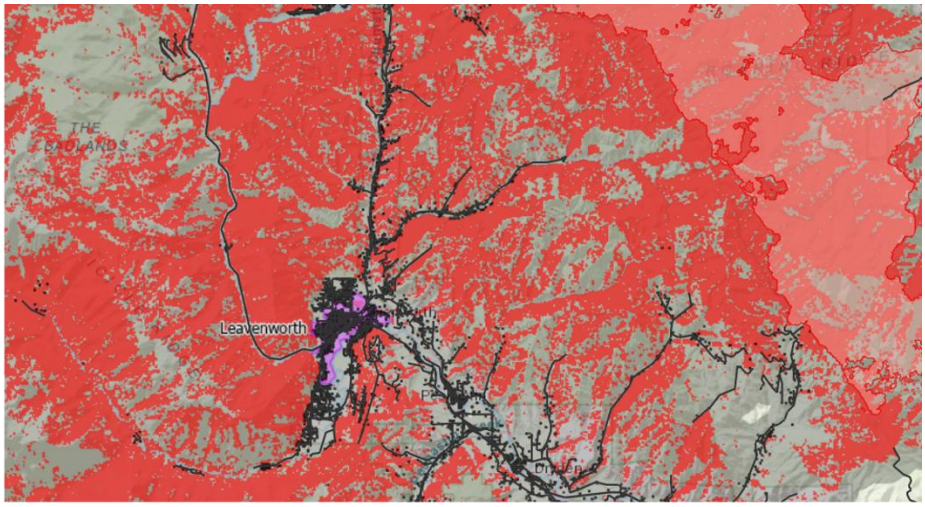


Source: Draft Wildfire Hazard Map – Washington State DNR

Exhibit 6: Ember Cast Risk in Leavenworth

Embers are the leading cause of home loss in wildfires, as they can travel miles ahead of the main fire front to ignite new spot fires.

- Areas subject to ember cast
- Structures
- Radiant heat



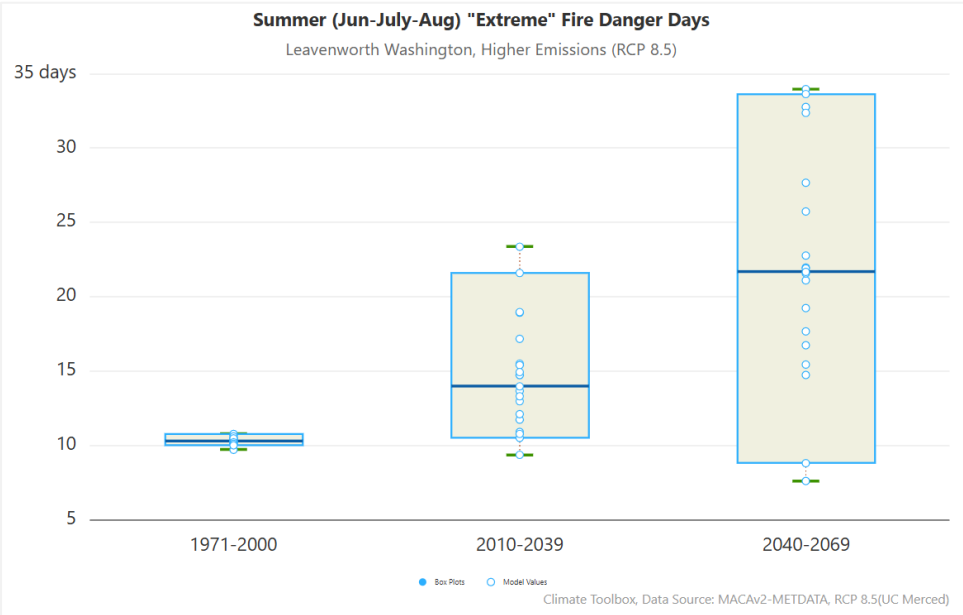
Source: Chelan County Community Wildfire Protection Plan

Exhibit 7. Wildfire Change Summary

Historical conditions	Projected changes

• Leavenworth experienced wildfires in 2017 (Mill Fire) and 1994 (Hatchery Complex), which led to City evacuations
• Since 1970, over two hundred fires have occurred within the Leavenworth area
• Average smoky days per year has increased by 34% per year **(Saldanha, 2021)**:
  • 2009-2013: 37 avg. smoke days/year
  • 2016-2020: 49 avg. smoke days/year
	• Risk of ember cast causing structure-to-structure spot fires
	• Drought conditions will keep soil and fuels dry
	• Leavenworth already has a severe risk for unhealthy air quality
	• WA Health Disparities: PM2.5 risk 10/10, Ozone risk 10/10

Exhibit 8: Extreme Fire Danger Days



DROUGHT AND SNOWPACK DECLINE

Drought is a prolonged period of abnormally low rainfall that leads to a shortage of water, affecting ecosystems, agriculture, and water supply. Changes in the climate can worsen drought by altering weather patterns, increasing the frequency and intensity of heat waves, and shifting the timing and distribution of precipitation. Snowpack loss means there is less snow falling and accumulating in the mountains. Warmer temperatures bring winter rains instead of snow, causing the snowpack to melt more quickly. The loss of snowpack reduces the amount of water available for drinking, agriculture, and healthy river ecosystems during the summer and fall.

100% of the population in Chelan County is affected by drought. This includes the historic 2015 snowpack drought and recent, recurrent snowpack deficits and fast melt. Beyond specific severe drought years, the Leavenworth area, particularly the Icicle Creek subbasin, faces chronic water supply challenges. The demands for domestic water, agriculture, and fish habitat often exceed the available supply. On average, water users in the Wenatchee Basin face water curtailment at least seven out of every ten years (Chelan County, 2018).

Exhibit 9: Spring Snow Water Equivalent

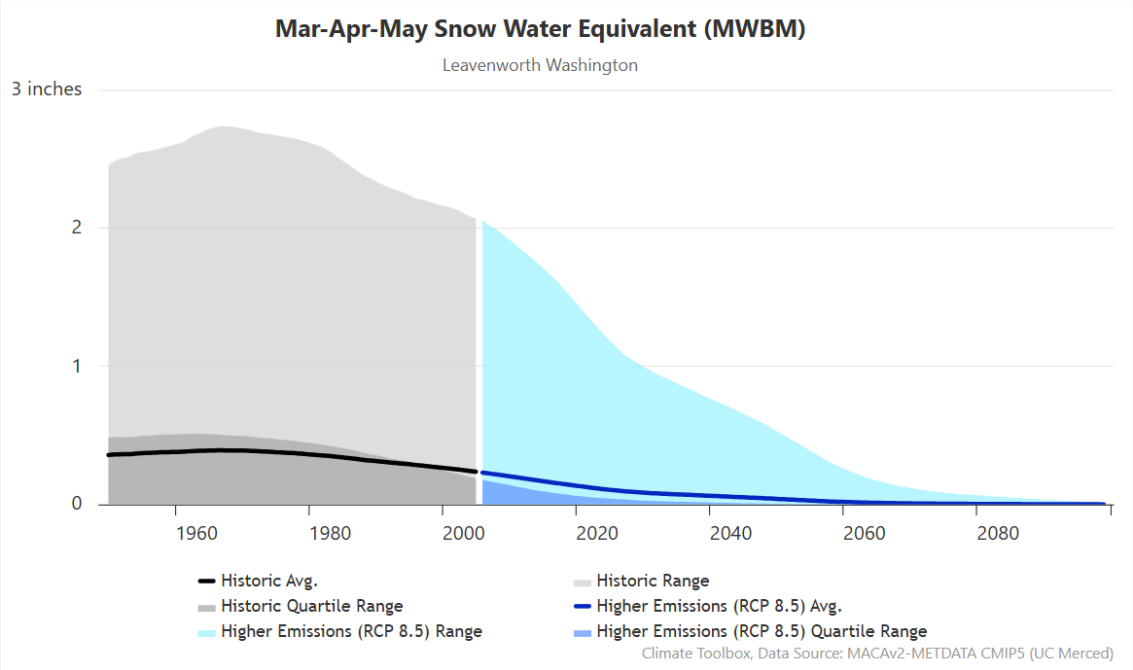


Exhibit 10: Summer Total Soil Moisture

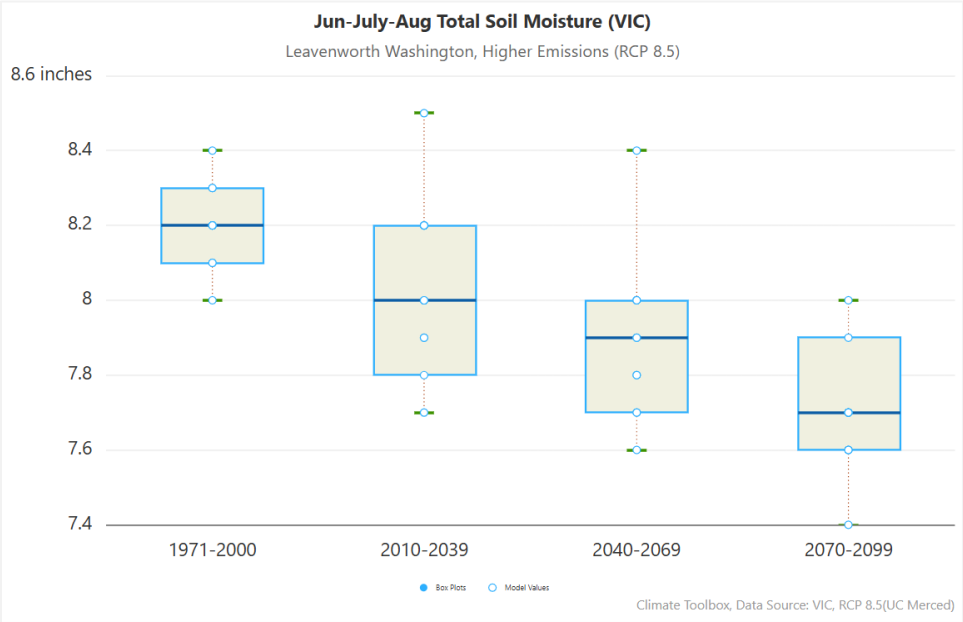


Exhibit 11. Drought Change Summary

Historical conditions	Projected changes
• Historic 2015 snowpack drought and recent, recurrent snowpack deficits and fast melt • Beyond specific severe drought years, the Leavenworth area, particularly the Icicle Creek subbasin, faces chronic water supply challenges • Demands for domestic water, agriculture, and fish habitat often exceed the available supply	According to UW Climate Impacts Group, RCP8.5 2020-2049: • Up to 3.2% increase in annual precipitation; 1.5% increase in late summer precipitation • Up to 26% chance of a precipitation drought in any year • Up to 24% decrease in summer streamflow: Wenatchee River at Leavenworth and Chumstick Creek • Up to 23% decrease in summer streamflow: Icicle Creek • Increase in low streamflow days: from 4 to 11 • Up to 79% decline in April 1st snowpack in Leavenworth

HEAVY RAIN AND FLOODING

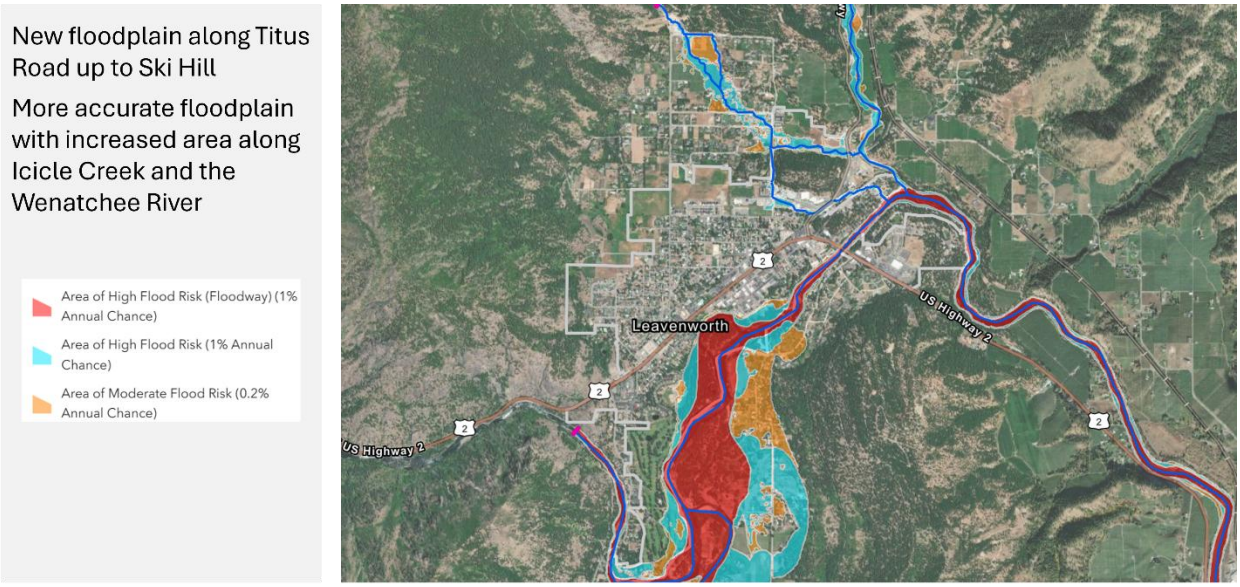
Rising temperatures influence extreme precipitation by increasing the atmosphere's capacity to hold moisture, leading to more intense and frequent episodes of heavy precipitation. Warm winds and heavy rain events, like the Pineapple Express, may occur more frequently and are predicted to be longer lasting and wider ranging (Henny & Kim, 2025). These changes will exacerbate flooding through more frequent and extreme precipitation events, increasing peak streamflow during winter months.

Leavenworth has an infrequent history of damaging floods. The City is developed high above the Wenatchee River and most of the river's floodplain is preserved within open spaces. Drainage from Ski Hill has historically been managed in open spaces, wetlands, and ditches;

however, growth and development in that area will influence future drainage patterns. The City is projected to see a 2-5% decrease in heavy and extreme precipitation magnitude the 2- and 25-year storms (Raymond & Rogers, 2022). However, the City will experience intense precipitation events from atmospheric rivers and it is unknown how unstable atmospheric conditions will contribute to more storms. In December 2025, an intense atmospheric river dropped record rainfall which caused record flood levels on the Icicle Creek and Wenatchee River, causing damage to the City's parks and open spaces within the floodplain.

First Street states that the City of Leavenworth has moderate risk from flooding. There are 123 properties in Leavenworth at risk of flooding over the next 30 years. This represents 7.3% of all properties in Leavenworth (First Street).

Exhibit 12: 2025 Preliminary FEMA Floodplain



Source: FEMA Chelan County, Washington Preliminary Floodplains (as of April 30, 2025)

Exhibit 13. Flood Change Summary

Historical conditions	Projected changes
• Areas like Ski Hill Drive, Center Street, West Street, and Whitman experience widespread flooding during storms • Chumstick Road and Titus Road face flooding during regional storms • Cedar/Burke Intersection and Orchard Street experience minor flooding during short-duration storms • Division Street, Commercial and 12th Street Intersection, and Commercial and 10th Street Intersection face minor flooding during storms	According to UW Climate Impacts Group, RCP8.5 2020-2049: • 2-5% decrease in heavy and extreme precipitation magnitude (does not factor in atmospheric rivers) • More winter flooding from snow falling as rain (e.g., El Niño) • Moderate Flood Risk; up to 7% of properties at risk over 30 years • 2-7% increase in peak streamflow (winter flooding) • Chumstick Creek 25-year return interval projected to become 10.7 years; Wenatchee River only 21.1 years

G.3 CLIMATE RISK ASSESSMENT

CRITERIA AND METHODOLOGY

The following section describes how vulnerability and risk were assessed for Leavenworth. The relationship between risk and vulnerability is described in Exhibit 14.

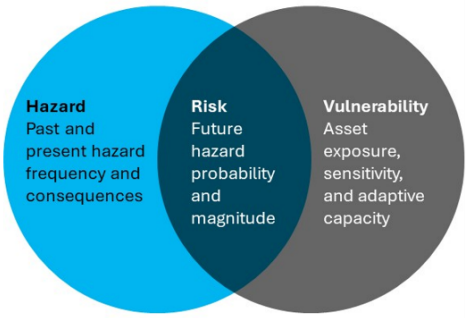
Exhibit 14: Relationship Between Hazards, Vulnerability, and Risk

Vulnerability

- Three key components: exposure, sensitivity, and adaptive capacity
- Exposure assesses the degree to which a system is subject to climate-related hazards
- Sensitivity evaluates how inherently affected a system is by these climate impacts
- Adaptive capacity measures a system's ability to adjust to climate change and minimize damage

Risk

- Two key components: probability and magnitude
- Probability evaluates the likelihood of specific climate change impacts occurring in a given region or system
- Magnitude refers to the severity and scale of potential impacts associated with identified climate risks, examining the physical, economic, and social consequences of climate events



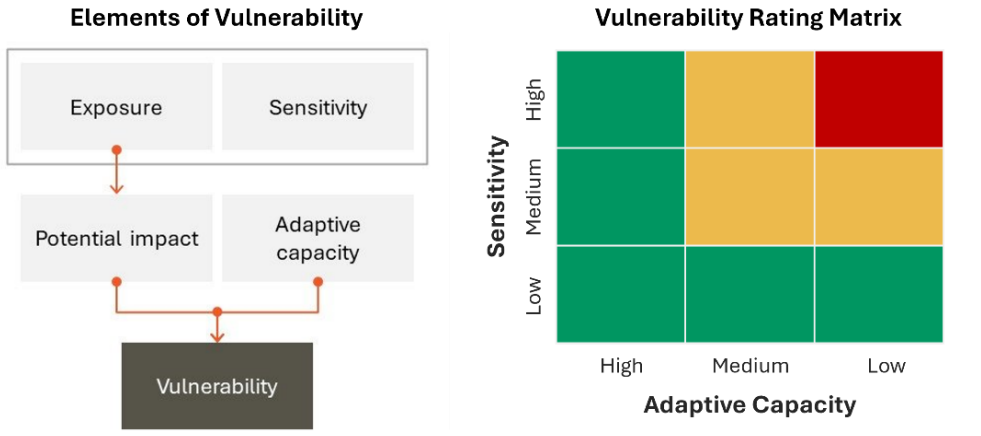
Source: Washington Department of Commerce

VULNERABILITY CRITERIA AND RATING

The framework for determining climate change vulnerability consists of three key components: exposure, sensitivity, and adaptive capacity. Exposure assesses the degree to which a system is subject to climate-related hazards, such as rising temperatures or extreme weather events, highlighting areas that face the greatest risk. Sensitivity evaluates how inherently affected a system is by these climate impacts, considering characteristics that may heighten vulnerability, such as age and condition of infrastructure or socio-economic factors like poverty. Adaptive capacity measures a system's ability to adjust to climate change and minimize damage, influenced by governance, available resources, technologies, and social networks.

To determine vulnerability, exposed asset-hazard pairs were evaluated for sensitivity and adaptive capacity using a qualitative rating system based on indicators such as age, asset condition, physical design, social assets, and economic costs. Each asset-hazard pair was assigned a high, medium, or low sensitivity and adaptive capacity rating. The sensitivity and adaptive capacity ratings were then charted to determine the overall vulnerability rating for each asset-hazard pair.

Exhibit 15: Vulnerability Ratings



Source: U.S. Climate Resilience Toolkit

Exhibit 16: Sensitivity and Adaptive Capacity Criteria

	Sensitivity	Adaptive Capacity
Low	• Minor repairs and accommodation required. • Slight inconveniences and temporary loss of services. • Minor disruption to business continuity and minimal loss of revenue and wages. • Little to no increase in costs and demands to respond to emergency events.	• Adaptive solutions are innovative but costly. • Adaptive solutions may require coordination with multiple agencies to implement, leading to disruptions in service and longer implementation times. • Solutions require change in lifestyle or changes in political decisions. • The ability to avoid damage is limited.
Medium	• Temporary loss of food production, transportation, and distribution. Temporary loss of functionality and operations closure of emergency response services. • Moderate repairs and replacements required. • Moderate increase in costs and demands to respond to emergency events.	• Impacts can be reduced or mitigated to a certain extent; however, adaptive solutions are only feasible for limited assets. • Some assets may face difficulties in adapting in terms of cost and implementation. • Coordination with third party agencies may be necessary for adaptivity measures. • Solutions require some change in systematic operations but are somewhat executable.
High	• Significant impact requiring reconstruction of parts or an entirety of an asset. • Extensive rehabilitation of assets resulting in long-term or permanent	• Assets can adapt with little to no difficulty. • Direct influence on the implementation of strategies or solutions for the asset is apparent.

	loss of functionality or operations closure. • Significant impact to vulnerable populations due to flooding and extreme precipitation-related deaths and illnesses, population displacement, or migration. • Permanent loss of species is not able to adapt to weather events exacerbated by climate change.	• Adaptive solutions are highly feasible for most, if not all assets with affordable costs. • Solutions are implemented immediately and face little to no resistance.

ASSESSING RISK

Risk is determined by multiplying the likelihood of an event occurring (probability) by the extent of damage (magnitude). The probability of each hazard was based on historical data and future projections, then assigned a corresponding score.

Magnitude is determined by ranking the vulnerability, redundancy, cost, and criticality for each asset-hazard pair. The individual ranks were assigned a corresponding score and totaled to provide a magnitude score. These scores were multiplied by the probability score to provide a risk score. Risks were categorized into Low, Medium, and High, corresponding to score ranges of 3-11, 12-21, and 13-30, respectively. Low risk corresponds to minimal or isolated impacts, medium risk to moderate impacts, and high risk to major and amplified impacts.

Exhibit 17: Risk Methodology

Probability Likelihood of occurring	**Magnitude** Extent of damage or loss	
Probability includes historical data and future projections **Low** Less than once every 20 years **Medium** Within 5-20 years **High** Within 1-5 years	**Vulnerability** Result from vulnerability assessment **Redundancy** Duplication of systems or components to ensure continued operation in the event of a failure of a single part **Financial Loss** Potential financial impact based on FEMA/HMP definitions, and asset-hazard pair analysis **Criticality** Risk to life and safety	**Probability X Magnitude = Risk** **Low risk:** 3-11 **Medium risk:** 12-21 **High risk:** 22-30

Vulnerability and Financial Loss: Low (1) Medium (2) High (3) | Redundancy: Low (3) Medium (2) High (1) | Criticality: Yes (1) No (0)

ASSESSMENT RESULTS

The following section describes current and expected climate impacts in Leavenworth and summarizes the risk assessment findings based on the mid-century (2020-2049) timeframe and the RCP8.5 emissions scenario. It is expected that climate impacts will change, and in some cases, significantly worsen after mid-century. Only assets with a medium or high vulnerability to a specific hazard were assessed for risk. Exhibit 18 identifies which asset-hazard pairs were assessed for risk.

Exhibit 18: Asset-Hazard Pairs Assessed for Risk

		Drought & Snowpack Loss	Extreme Temperatures	Extreme Flooding & Rain	Wildfire & Smoke	Severe Storms
1	Buildings and housing			X	X	X
2	Community members, vulnerable populations, visitors	X	X	X	X	X
3	Cultural sites, culturally significant activities	X	X	X	X	X
4	Emergency and medical response, management, comms				X	X
5	Food producers and resources				X	X
6	Power and communications infrastructure	X	X	X	X	X
7	Recreation areas, tourism, open spaces, parks	X	X	X	X	X
8	Sensitive aquatic and terrestrial species and habitats	X	X	X	X	x
9	Sewer and wastewater infrastructure, stormwater	X		X	X	X
10	Transportation infrastructure		X	X	X	X
11	Waste hauling, waste management, recycling			X	X	X
12	Water supply, water infrastructure, irrigation infrastructure	X		X	X	X

BUILDINGS AND HOUSING

Structures in Leavenworth are most vulnerable to flooding, wildfire, and severe storms. Commercial, residential, tourism, and light industrial buildings in these basins are the most exposed to flooding:

- Ski Hill Basin: Ski Hill Drive, Center Street, West Street, Whitman Street
- Alpensee Strasse Basin: Chumstick Road, Titus Road
- Downtown West Basin: Cedar Street/Burke Street Intersection, Orchard Street
- Downtown East Basin: Division Street, Commercial Street and 10th Street and 12th Street intersections

Areas like Ski Hill Drive, Center Street, West Street, and Whitman Street are more prone to widespread flooding during storms. New development is increasing impervious surfaces, which worsens flooding.

With increasingly severe winter storms and wind events, buildings and homes near trees are at risk of structural damage from falling trees. In areas that experience frequent flooding, this can lead to significant damage and repair costs. Woody debris left over from storms can become fuel for fires and habitat for invasive pests. Structures located near steep slopes face increased risk from landslides, debris flows, and erosion during and after severe storms.

Leavenworth is ranked #1 of 50 communities in Washington with the greatest cumulative housing-unit exposure to wildfire due to the Chumstick area's dense population, long fire-free interval, and limited evacuation options (Scott, Gilbertson-Day, & Stratton, 2018). Structures in Leavenworth, especially those in the wildland-urban interface, face the highest risk of exposure to ember cast. It is more likely that a structure fire would be caused by an ember cast than a wildland fire reaching the structure. The vulnerability of buildings and housing depends on construction materials, air filtration systems, defensible space, nearby vegetation, and land management.

Exhibit 19: Buildings and Housing Risk Summary

Hazard	Probability	Vulnerability	Redundancy	Cost	Criticality	Magnitude	Risk
Severe Storms	Medium	High	Low	High	Yes	High	Medium
Heavy Rain & Flooding	Medium	Medium	Medium	Medium	Yes	Medium	Medium
Wildfire & Smoke	High	Medium	Medium	High	Yes	High	High

COMMUNITY MEMBERS, VULNERABLE POPULATIONS, VISITORS

Climate hazards affect Leavenworth residents and visitors unequally, with some populations facing greater risks. Wildfire smoke threatens respiratory health, especially for people with preexisting conditions, low-income residents, non-English speakers, and those in poor-quality housing. These groups also face greater risks during evacuations and property-damage events. Seasonal workers and outdoor industry employees are economically vulnerable to wildfire, smoke, and extreme temperature disruptions. Flooding causes productivity losses and expensive repairs that can burden households with limited financial resources.

Extreme heat and cold affect vulnerable populations—elderly, children, and chronically ill individuals—most severely, with heat generally causing worse health impacts. Power and internet outages during extreme weather add to community stress. Lack of health insurance and financial resources increases vulnerability. Younger residents tend to be more climate-aware due to school education, while older generations may have less knowledge (Tyson, Kennedy, & Funk, 2021). The combined effects of wildfire, flooding, temperature extremes, and economic disruption necessitate targeted public health and equity-focused adaptation strategies.

Exhibit 20: Community Members Risk Summary

Hazard	Probability	Vulnerability	Redundancy	Cost	Criticality	Magnitude	Risk
Severe Storms	Medium	High	Medium	High	Yes	High	High
Drought & Snowpack Decline	High	Medium	High	Medium	Yes	Medium	Medium
Extreme Temperatures	Medium	Medium	Medium	Medium	Yes	Medium	Medium
Heavy Rain & Flooding	Medium	Medium	Medium	High	Yes	High	High
Wildfire & Smoke	High	Medium	Medium	High	Yes	High	High

CULTURAL SITES, CULTURALLY SIGNIFICANT ACTIVITIES

Culturally significant sites and significant activities include historic and culturally significant structures, traditional activities, and traditional territories. The traditional territory of the p'sqousa along Waterfront Park faces climate threats that could cause permanent damage. Habitats along the Icicle and Wenatchee rivers are highly exposed to drought and reduced snowpack, threatening salmon that depend on specific water flows and timing. Lower soil

moisture increases wildfire risk and plant death, endangering culturally important vegetation. Wildfires cause long-term changes in site access and use and threaten culturally significant plants and animals. Flooding also affects riparian and wetland habitats through direct damage and erosion, as experienced in December 2025, degrading habitat and temporarily blocking access to cultural resources.

Temperature extremes add further stress. While native plants and wildlife can handle some temperature variation, aquatic species are highly sensitive to prolonged warm water, which can cause widespread fish deaths. Extreme heat and cold limit the extent to which people can participate in outdoor cultural activities. The combined effects of water disruption, heat stress, wildfire, and flooding threaten both the ecosystems that support culturally important species and the physical heritage sites themselves.

Exhibit 21: Culturally Significant Habitat and Wildlife

Hazard	Probability	Vulnerability	Redundancy	Cost	Criticality	Magnitude	Risk
Severe Storms	Medium	Medium	High	Low	No	Low	Low
Drought & Snowpack Decline	High	Medium	Low	Medium	No	Medium	Medium
Extreme Temperatures	Medium	Medium	Medium	Medium	No	Medium	Medium
Heavy Rain & Flooding	Medium	Medium	Medium	Low	No	Medium	Low
Wildfire & Smoke	High	Medium	Low	High	No	High	High

The majority of Leavenworth's museums and culturally significant buildings are located in the downtown corridor, and at most risk from wildfire and severe storms. The town's signature Bavarian-themed architecture, which defines Leavenworth's character and drives tourism, is concentrated within the compact downtown core along Front Street and the surrounding blocks. These wood-framed structures, while aesthetically significant, are more vulnerable to embers and radiant heat during wildfire events. Beyond the downtown area, the Leavenworth Ranger Station on Highway 2 is the City's only registered national historical site.

Exhibit 22: Culturally Significant Buildings

Hazard	Probability	Vulnerability	Redundancy	Cost	Criticality	Magnitude	Risk
Severe Storms	Medium	High	Low	High	Yes	High	Medium
Heavy Rain & Flooding	Medium	Medium	Medium	Medium	Yes	Medium	Medium
Wildfire & Smoke	High	Medium	Medium	High	Yes	High	High

EMERGENCY AND MEDICAL RESPONSE, MANAGEMENT, COMMUNICATIONS

Emergency services in Leavenworth may face capacity constraints from more frequent and severe natural hazard events. Flooding and severe storms can block roads and delay emergency response, especially when floodwaters and debris affect access routes or emergency facilities. Severe storms also force emergency responders to help with cleanup, reducing capacity for medical emergencies and increasing demand for emergency services. All emergency facilities are exposed to wildfire, with vulnerability depending on building materials, air filtration, defensible space, and nearby vegetation. More frequent wildfires will require enhanced response capabilities, increased fire bans and enforcement, and more firefighting deployments. Emergency services with limited capacity serving vulnerable populations face the greatest strain.

Emergency services face multiple operational challenges: facility and equipment damage from wildfire, delayed response times from blocked roads during severe storms, and staff limitations when resources are diverted to disasters. Vulnerable populations (elderly, chronically ill, low-income, non-English speakers) need more support during evacuations, power outages, and temperature extremes. Rising incident frequency across multiple hazard types with limited emergency capacity creates serious public safety risks.

Exhibit 23: Emergency Management Risk Summary

Hazard	Probability	Vulnerability	Redundancy	Cost	Criticality	Magnitude	Risk
Severe Storms	Medium	Medium	High	Medium	Yes	Medium	Medium
Wildfire & Smoke	High	Medium	High	Medium	Yes	Medium	Medium

FOOD PRODUCERS AND RESOURCES

Leavenworth has little agricultural land within City limits and its UGA, but faces indirect food security risks through regional agriculture and food distribution. Regional drought and snowpack loss threaten agricultural jobs and could disrupt employment if farming productivity declines. Agricultural facilities in high wildfire risk areas face crop and building damage. Extreme temperatures threaten crops through heat damage and frost, though in-City exposure is minimal.

Food security risks come mainly through commercial food distribution. Power outages threaten grocery stores and food retailers with product loss from refrigeration failures and supply chain disruptions. Wildfire damage to regional food facilities and roads could limit local food availability, and smoke may contaminate crops. Road closures limit the ability of food supply to enter the City.

Exhibit 24: Food Resources Risk Summary

Hazard	Probability	Vulnerability	Redundancy	Cost	Criticality	Magnitude	Risk
Severe Storms	Medium	Medium	Low	Medium	Yes	High	Medium
Wildfire & Smoke	High	Medium	High	Low	Yes	Medium	Medium

POWER AND COMMUNICATIONS INFRASTRUCTURE

Power and communications service reliability is primarily vulnerable to severe storms, drought, and wildfire. As experienced in the December 2025 winter storm, power transmission lines were vulnerable to falling trees after prolonged rain, warm temperatures, and extreme wind. This led to power outages in Leavenworth that lasted for multiple days. Regional drought and reduced snowpack may decrease hydropower generation, and though Chelan County PUD has reserve capacity, prolonged deficits would still impact users. Wildfire threatens all infrastructure, particularly older systems with untreated wooden poles and poor vegetation management. During times of extreme fire danger, the PUD may implement a Public Safety Power Shutoff (PSPS) and proactively shut off power in high-risk areas.

Communications infrastructure has similar vulnerabilities based on infrastructure age, materials, and fire resistance. Growing demand driven by population growth and electrification, combined with aging infrastructure and intensifying natural hazards, threatens the reliability of power and communications that all sectors depend on.

Exhibit 25: Power and Communications Risk Summary

Hazard	Probability	Vulnerability	Redundancy	Cost	Criticality	Magnitude	Risk
Severe Storms	Medium	High	Low	Medium	Yes	High	Medium
Drought & Snowpack Decline	High	Medium	High	Medium	Yes	Medium	Medium
Extreme Temperatures	Medium	Medium	High	Low	Yes	Medium	Low
Heavy Rain & Flooding	Medium	Medium	High	Low	Yes	Medium	Low
Wildfire & Smoke	High	Medium	Medium	High	Yes	High	High

RECREATION AREAS, TOURISM, OPEN SPACES, PARKS

Recreation areas and tourism in Leavenworth face climate impacts affecting ecology, recreation, and the economy. Drought and snowpack decline significantly impacts both winter and summer outdoor recreation. Warmer or dryer winters with low snowfall or earlier snowmelt lead to a shorter snow recreation season, which is usually followed by low streamflows, impacting summer river recreation.

All recreation areas and facilities are exposed to wildfire; however, riparian zones may be less vulnerable because of more moisture, though vulnerability depends on fuel loading, fire intensity, and land management. Wildfires can cause long-term transportation disruptions and area closures, and when combined with subsequent rainfall, can damage access roads and reduce site usability. Smoke degrades air quality and makes outdoor recreation unsafe. Extreme heat can affect the ability to recreate outdoors safely, while severe winter conditions can restrict access (despite supporting winter tourism). Severe storms threaten events like Christmastown through power outages and transportation disruptions, directly impacting tourism revenue.

Tourism vulnerability reflects Leavenworth's economic dependence on outdoor recreation and seasonal visitors. Summer wildfire smoke and low streamflows can reduce warm-season tourism opportunities, while winter storm variability creates uncertainty for snow-dependent activities. Reduced site access, diminished visitor experience, and landscape changes can create compound economic risks for tourism businesses and City revenue.

Exhibit 26: Recreation and Tourism Risk Summary

Hazard	Probability	Vulnerability	Redundancy	Cost	Criticality	Magnitude	Risk
Severe Storms	Medium	High	Low	High	No	High	Medium
Drought & Snowpack Decline	High	High	Medium	High	No	High	High
Extreme Temperatures	Medium	Medium	High	Low	No	Low	Low
Heavy Rain & Flooding	Medium	Medium	High	Low	No	Low	Low
Wildfire & Smoke	High	Medium	Medium	High	No	Medium	Medium

SENSITIVE AQUATIC AND TERRESTRIAL SPECIES AND HABITATS

Sensitive species and habitats in Leavenworth are under threat from climate stressors that compromise survival and ecosystem health. Aquatic, riparian, and forested ecosystems are highly vulnerable to drought and reduced snowpack, and salmon, steelhead, and native coldwater fishes are critically dependent on specific water timing, temperatures, and volume in Icicle Creek and the Wenatchee River. Lower soil moisture increases wildfire risk and plant death, while prolonged warm water temperatures directly kill temperature-sensitive aquatic species. Riparian and wetland habitats that are subject to flooding and erosion may experience habitat degradation and the loss of tree cover and shade that regulate stream temperatures. Wildfire exposure varies by location, fire history, and habitat presence, with sensitivity affected by species' fire adaptations, invasive species, habitat fragmentation, reduced biodiversity, and fuel moisture.

Wildfires cause cascading effects beyond direct deaths: increased invasive species in burned areas, loss of forest habitat and carbon storage, elevated runoff and sediment that degrade streams, and aquatic and terrestrial deaths. While native species can tolerate some temperature variation, projected extremes—especially sustained warm water—exceed the limits of some aquatic organisms. The combined effects of water disruption, heat stress, flooding, wildfire, erosion, sedimentation, and invasive species pose serious threats to ecosystem function and biodiversity. Species with narrow temperature tolerance, specific habitat needs, limited movement ability, or existing stress will face heightened risk under changing climate conditions.

Exhibit 27: Ecosystems and Wildlife Risk Summary

Hazard	Probability	Vulnerability	Redundancy	Cost	Criticality	Magnitude	Risk
Severe Storms	Medium	Medium	High	Low	No	Low	Low
Drought & Snowpack Decline	High	Medium	Low	Medium	No	Medium	Medium
Extreme Temperatures	Medium	Medium	Medium	Medium	No	Medium	Medium
Heavy Rain & Flooding	Medium	Medium	Medium	Low	No	Medium	Low
Wildfire & Smoke	High	Medium	Low	High	No	High	High

SEWER AND STORMWATER INFRASTRUCTURE

Sewer and stormwater infrastructure face increasing operational challenges and physical damage from climate hazards. Flooding directly threatens infrastructure through erosion and inundation. Aging or undersized infrastructure is more sensitive to intense precipitation, potentially causing system surcharges, damage, and costly repairs. Severe storms generate high volumes of debris and sediment that block or clog stormwater systems, reducing capacity and increasing local flooding. Wildfire threatens infrastructure both directly (systems in fire perimeters face flame and heat damage) and indirectly (infrastructure downstream of burned areas experiences altered water flow, increased sediment, and debris-laden flows).

Post-wildfire conditions create compound stress. The soils in burned watersheds become hydrophobic and do not allow water to infiltrate. The reduction in infiltration and ground vegetation accelerates and increases runoff, increasing peak stormwater flows. Sediment and derbis flows from burned slopes damage infrastructure, reduce system capacity through deposits, and overwhelms treatment facilities. Floodwater from burned areas carry ash, charred vegetation, and soil that blocks inlets, clogs pipes, and fills retention facilities, requiring extensive maintenance and costly repairs. Increasing precipitation intensity, debris loading, and post-wildfire watershed changes may pose systemic risks to sewer and stormwater infrastructure functionality.

Exhibit 28: Sewer and Stormwater Risk Summary

Hazard	Probability	Vulnerability	Redundancy	Cost	Criticality	Magnitude	Risk
Severe Storms	Medium	High	Low	Medium	Yes	High	Medium
Drought & Snowpack Decline	High	Medium	Medium	Medium	Yes	Medium	Medium
Heavy Rain & Flooding	Medium	Medium	Medium	High	Yes	High	Medium
Wildfire & Smoke	High	Medium	Medium	Medium	Yes	Medium	Medium

TRANSPORTATION INFRASTRUCTURE

Roads, bridges, and transportation connectivity in Leavenworth are vulnerable to nearly every climate hazard. Flooding can damage roads in flood-prone areas, with chip-sealed roads particularly vulnerable to erosion during heavy rain. Many City roads use chip seal, which lacks asphalt's resilience to prolonged moisture, leading to accelerated breakdown and increased maintenance costs. Temperature extremes create stress through freeze-thaw cycles, which damages roads and bridges through expansion-contraction, and extreme heat which causes asphalt to soften leading to rutting, bleeding, and failure. Bridges are sensitive to thermal expansion that can warp components and reduce load capacity. Older or damaged surfaces are more vulnerable to temperature extremes.

Wildfire comprehensively threatens transportation, with routes in wildland-urban interface and high-risk areas most exposed. Direct impacts include burned guardrail and signs, damaged bridges and roads, and destroyed roadside infrastructure like power lines for lighting and signals. Poor vegetation maintenance increases fire risk near critical assets. Post-fire impacts include slope destabilization, increased erosion, and landslides or debris flows that block routes and undermine roads. Limited alternative routes mean extended isolation after wildfire closures and challenging evacuations. Worsening climate hazards may shorten infrastructure lifespans, increase costs, and decrease the reliability essential to emergency response and community connectivity.

Exhibit 29: Transportation Risk Summary

Hazard	Probability	Vulnerability	Redundancy	Cost	Criticality	Magnitude	Risk
Severe Storms	Medium	High	Low	Medium	Yes	High	Medium
Extreme Temperatures	Medium	Medium	Medium	Medium	Yes	Medium	Medium
Heavy Rain & Flooding	Medium	Medium	Medium	High	Yes	High	Medium
Wildfire & Smoke	High	Medium	Low	Medium	Yes	High	High

WASTE HAULING, WASTE MANAGEMENT, RECYCLING

Waste management is vulnerable to natural hazards mainly through debris surges and service disruptions. Flooding often increases storm debris and may impact collection routes, though impacts are expected to be minimal given reliance on Chelan County resources. Flood or storm-related route interruptions may delay service but generally cause temporary constraints. Severe storms that generate significant debris (as seen in December 2025) strain the City's capacity, slowing recovery and increasing costs as debris volumes exceed staff's capacity or capabilities.

Wildfire poses the most significant challenge due to large volumes of varied, potentially hazardous debris. Wildfire frequency increases exposure in wildland-urban interface areas, with debris quantity depending on fire size and materials burned. Burned structures generate hazardous waste (asbestos, treated wood, heavy metals, contaminants) requiring specialized handling and disposal beyond standard capabilities. Large wildfires can overwhelm regional

and local cleanup capacity, requiring contracted services, temporary staging areas, and extended recovery. Wildfire waste challenges also include air quality impacts from smoldering debris, potential surface water contamination from ash, combustion risks, and service disruptions.

Exhibit 30: Waste Management Risk Summary

Hazard	Probability	Vulnerability	Redundancy	Cost	Criticality	Magnitude	Risk
Severe Storms	Medium	Medium	Medium	High	Yes	High	Medium
Heavy Rain & Flooding	Medium	Medium	High	High	Yes	Medium	Medium
Wildfire & Smoke	High	Medium	Medium	High	Yes	High	High

WATER SUPPLY, WATER INFRASTRUCTURE, IRRIGATION INFRASTRUCTURE

Drought and reduced snowpack create fundamental supply constraints, as the City's water depends on the winter snowpack and spring snowmelt that replenishes soil moisture and aquifer recharge. Diminished water availability threatens commercial and domestic needs citywide, with potential long-term water deficits. Flooding threatens critical infrastructure, particularly the Leavenworth well field on Icicle Road near the Wenatchee River and the City's Icicle Creek intake. Past flooding shows sensitivity to contamination and damage to pumps, electrical systems, and well casings.

Water quality and treatment face challenges from increased turbidity caused by high flows, post-fire debris flows, and warm water temperatures. Extreme heat affecting surface water can compromise quality and temperature requirements, while seasonal temperature variations limit maximum treatment flow rates. Spring high silt loading requires frequent filter backwashing; when turbidity is elevated, backwashing becomes less effective, creating operational challenges and potentially reducing capacity. Wildfire threatens systems with exposure based on distribution infrastructure and water sources in wildland-urban interface areas. Surface water sources with limited treatment capabilities are more sensitive to wildfire-induced degradation through erosion, sediment, ash, and turbidity. Post-fire runoff can severely degrade water quality, potentially requiring enhanced treatment and filtration. Older infrastructure lacking redundancy is vulnerable to wildfire damage, while firefighting creates surge demand during critical periods.

Exhibit 31: Water Resources Risk Summary

Hazard	Probability	Vulnerability	Redundancy	Cost	Criticality	Magnitude	Risk
Severe Storms	Medium	Medium	Medium	Medium	Yes	Medium	Medium
Drought & Snowpack Decline	High	High	Medium	Medium	Yes	High	High
Heavy Rain & Flooding	Medium	Medium	Medium	High	Yes	High	Medium
Wildfire & Smoke	High	Medium	High	Medium	Yes	Medium	Medium

G.4 RESILIENT GOALS AND POLICIES

The following goals and policies are summarized from the Leavenworth Comprehensive Plan.

CLIMATE RESILIENCE

CR1. Make Leavenworth a City that is resilient to the impacts of natural hazards and able to prepare for, respond to, and quickly recover from extreme weather, wildfires, and other natural hazards worsened by climate change.

1.1. Support the implementation of the Community Wildfire Protection Plan and Hazard Mitigation Plan to increase emergency response capabilities, mitigate against natural hazards, create fire-resilient landscapes, promote fire-adapted communities, protect the economy, and foster short- and long-term recovery.
1.2. Integrate climate resilience into City operations and decision-making by incorporating climate adaptation and climate equity into plans, regulations, processes, and procedures.
1.3. Coordinate climate resilience planning with regional, state, and tribal partners, emergency management agencies and special use districts.
1.4. Consider climate impacts and worsening climate hazards when planning for emergency preparedness, response, and recovery activities.

CR2. Ensure environmental justice by providing all residents with an equitable opportunity to learn about climate impacts, influence policy decisions, and take actions to enhance community resilience.

2.1. Create and implement outreach and education initiatives and materials that will inform the community about near-term and longer-term climate change threats and build resilience.
2.2. Prioritize actions that reduce risks to vulnerable populations during climate-related emergencies.
2.3. Support the identification and use of smoke-safe indoor spaces where vulnerable populations may gather during prolonged wildfire smoke events.
2.4. Support education of and outreach on the use of drought-tolerant and fire-resistant vegetation, water-efficient landscaping, and maintenance practices that promote water conservation.

CAPITAL FACILITIES

CF1. Ensure the City can meet water use demand under drought conditions.

1.1 Investigate opportunities to develop a municipal reclaimed water system and allow onsite non-potable water systems to reduce water demand in private-sector commercial and residential buildings.
1.2 Evaluate the long-term adequacy of water delivery infrastructure to ensure that changes in hydrological patterns (e.g., increases in flooding frequency or reduction of late-summer water availability associated with climate change) can be anticipated and managed effectively.
1.3 Consider requiring the use of green infrastructure and low-impact development to address increased storm intensities and stormwater runoff.

CF2. Enhance emergency preparedness, response, and recovery capabilities to mitigate risks and impacts associated with extreme weather and other hazards worsened by climate change.

2.1 Analyze how the municipal water system maintains adequate pressure during a major wildfire event (e.g., multiple structures burning) and how it will look under current and projected drought conditions.

2.2 Support the ongoing implementation and periodic updates of the of Community Wildfire Protection Plan.

2.3 Develop resilience hubs – community-serving facilities that are designed to support residents, coordinate communication, distribute resources, and reduce carbon pollution while enhancing quality of life during emergencies and extreme weather events.

CF3. Ensure public infrastructure and services can withstand current and projected climate conditions.

3.1 Plan, site, design, maintain, and operate capital facilities to function under current and projected climate conditions, including increased heat, storm intensity, and wildfire risk, and ensure continued operation during and after climate-related events so that essential services remain available during and after climate-related events.

- Integrate climate risk screening into all capital projects and asset management, using the best available science.
- Prioritize resilience retrofits of critical facilities including backup power, redundant communications, floodproofing, and smoke/heat filtration.
- Expand distributed backup power for critical facilities and designated cooling/clean air shelters.
- Increase stormwater system capacity and use green infrastructure sized for projected storm intensity.
- Apply WUI-aligned design standards to City facilities and rights-of-way, in coordination with Chelan County Fire District 3.
- Pursue funding and adopt code/standard updates to institutionalize climate-resilient design in City projects.

3.2 Prepare for efficient and coordinated disaster debris management to support rapid emergency response, timely community recovery, and economic stability following natural hazard events.

ECONOMIC DEVELOPMENT

ED1. Foster a balanced, diversified and sustainable local economy that contributes to Leavenworth's high-quality of life.

1.5. Support a diverse local economy by supporting a broad range of development types and land uses that contribute to economic resilience.

1.7. Facilitate new and existing employers to invest in modernization and environmentally sound technologies, support clean and low-impact industries, expand export of local goods and services, and include cottage and light industrial uses.

ED2. Strengthen and build-upon Leavenworth's many cultural, historical, and recreational amenities and its natural setting.

2.3. Encourage the management of healthy forest stands to promote sustainable timber resources, reduce wildfire risk, manage hazardous trees, and support forest-related employment.

2.5. Maintain and enhance year-round opportunities for sustainable tourism and a balanced mix of visitor and residential uses.

ED6. Ensure that the local economy is resilient to climate disruptions and fosters business opportunities associated with climate adaptation.

6.1 Support local businesses' efforts to bolster climate preparedness and continuity of operations.

HOUSING

H6. Ensure that residential development and redevelopment projects are resilient to the impacts of climate change.

6.1. Prioritize the preservation and weatherization of housing in overburdened communities to protect residents from the harmful impacts of climate change and increase housing resilience.

6.2. Support and promote programs to distribute cooling units and install heat pumps, prioritizing households or facilities with residents (e.g., low-income seniors) most vulnerable to extreme temperature events.

6.3. Encourage the implementation of recommended actions in the WUI building standards as prescribed by Chelan County Fire District 3.

LAND USE

LU2. Implement Leavenworth's vision, goals, and policies through the Future Land Use Map and development regulations.

2.8. Identify and protect open space, forested areas, and greenspaces in the City and urban growth areas that are important for wildlife, recreation, ecological services, climate resilience, and the community.

LU3. Promote high-quality and efficient use of buildable lands by balancing development regulation flexibility and predictability.

3.1. Allow clustering that preserves open space and administrative deviations for minor variations/ deviations from prescribed standards.

LU5. Preserve the natural environment and consider environmental justice, harnessing best available science, conservation and land management practices to create a resilient community.

5.1. "Encourage use of best available science to protect and ensure the integrity of the natural environment. Promote use of techniques, such as clustering, conservation easements, land trusts, stormwater utility funds, conservation easements, sensitive site planning, best land management practices and flexible regulations, to help retain and protect open space, environmentally critical areas, and unique natural features by:

- Utilizing SEPA, the Shoreline Master Program, Flood Hazard Reduction, and Critical Areas policies and regulations to ensure protection of the natural environment, critical resources, and habitat vital for safe species migration.

- Discouraging development in areas with natural hazard risk such as those susceptible to landslide, flood, avalanche, unstable soils, and excessive slopes.
- Continuing to implement the excavation and grading ordinance to regulate excavation, grading, and earthwork construction activities.
- Supporting the efforts of public and private organizations, whose goal is the preservation or conservation of critical areas.
- Allowing open space and recreational use of critical areas where such use does not negatively impact critical areas.
- Preserving and enhancing conservation or protection measures necessary for anadromous fisheries."

5.2. Preserve the City's dark skies through lighting regulations to support ecosystem health and the enjoyment of the community.

5.3. Where identified, address environmental justice concerns and reduce and eliminate disparities through land use policies and development regulations.

5.4. Consider and address potential and identified environmental health disparities through development regulations.

5.5. The goals and policies of the Leavenworth Shoreline Master Program, as amended, are considered an element of the City of Leavenworth Comprehensive Plan, and are included by reference as if fully set forth herein.

5.6 Incorporate drought and fire-resistant vegetation into landscaping requirements.

LU6. Protect and maintain air and water quality.

6.1. Adopt and implement stormwater and drainage standards within the corporate limits and UGA that protect water resources from impacts caused by development, utilizing source control, on-site detention, and treatment of storm water, where appropriate.

6.2. Review and monitor drainage, flooding, and stormwater for potential contamination, providing guidance for corrective actions and mitigation where necessary.

6.3. Encourage and support future and ongoing state water quality monitoring programs.

6.4. Support water quality education programs which inform local citizens and visitors about water quality issues.

6.5. Encourage appropriate regulatory agencies to pursue violators who illegally discharge waste into rivers, lakes, and streams.

6.6. Protect the availability of potable water by minimizing the potential for contamination of ground water sources from residential, commercial, and industrial activities. When necessary, encourage the restoration of contaminated ground water sources.

6.7. Continue to support and participate in the implementation of the Wenatchee Watershed Management Plan.

6.8. Recognize the potential benefits of public water, rail, electric, alternative fuels, non-motorized, and air transportation in helping maintain local air quality.

6.9. Encourage green stormwater infrastructure that incorporates drought and fire-resistant vegetation where possible.

6.10. Develop and implement a wildfire smoke resilience strategy in partnership with

local residents, emergency management officials, regional clean air agency officials, and other stakeholders.

6.11. Prioritize at-risk community members for actions that mitigate wildfire smoke, including providing personal protective equipment and filter fans or incentivizing infrastructure updates (e.g., HVAC updates and MERV 13 filters for air intake) for facilities that serve high-risk populations.

LU10. Ensure that buildings are designed and built sustainably to reduce environmental impacts and remain resilient to extreme weather, wildfire, and other hazards worsened by climate change.

10.1. Through development regulations, the zoning map, and planning practices, consider and mitigate wildfire risks. Such practices may include applying the Wildland-Urban Interface Code, considering Firewise practices, and separating development from wildfire prone areas.

TRANSPORTATION

TE1. Provide a safe, accessible, well-connected, and complete transportation system for travelers of all modes, all ages, and all abilities.

1.11. Support and encourage development of electric vehicle charging infrastructure.

TE 4. Preserve, maintain, and construct transportation infrastructure to be long-lasting, resilient, aligned with the land use element, and financially sustainable.

4.2. Identify and implement strategies and standards to ensure the resilience of the existing and new transportation system from climate change exacerbated hazards.

TE 5. Ensure that the local transportation system — including infrastructure, routes, and travel modes — is able to withstand and recover quickly from the impacts of extreme weather events and other hazards exacerbated by climate change.

TE 5.1. Identify and mitigate transportation infrastructure that is vulnerable to repeated floods, landslides, and other natural hazards.

TE 5.2. Create evacuation plans and outreach materials to help residents plan and practice actions that make evacuation quick, speed up and improve the safety of evacuation.

UTILITIES

UT3. Ensure that energy infrastructure – including generation and transmission – is able to accommodate renewable energy opportunities and can withstand and recover quickly from the impacts of extreme weather events and other natural hazards worsened by climate change.

3.1. Work with energy utilities to improve the safety and reliability of infrastructure vulnerable to climate change.

3.2. Continue to work with Chelan County PUD to increase the resiliency of the electric grid and reduce the risk of wildfires through maintenance, upgrades, and vegetation management, among other methods.

3.3. Require all new and existing transmission lines, electrical distribution, and communication lines to be installed underground where feasible.

UT4. Encourage buildings to use renewable energy, conservation, and efficiency technologies and practices to reduce greenhouse gas emissions.

4.1. Encourage the retrofit of existing buildings for energy efficiency, where feasible.
4.2. Require all publicly owned buildings to be powered completely by renewable energy, where feasible.

G.5 PUBLIC ENGAGEMENT SUMMARY

The City implemented an engagement strategy as outlined in the Comprehensive Plan Public Participation Plan (PPP) and Climate Element Supplement, focused on engaging the whole community, including vulnerable populations, underserved communities, and Tribal partners.

COMMUNITY ENGAGEMENT NIGHTS

The climate planning team participated in three community engagement nights and the summer block party with interactive posters and climate information.

LEAVENWORTH EARTH DAY CELEBRATION

The City of Leavenworth and Chelan County climate planning teams set up a booth to engage with community members. Information provided included posters with climate hazard information, an interactive poster to gauge climate concern, and a kids' activity.

CLIMATE CHANGE SURVEY

The City promoted a county-wide climate resilience survey to community members through social media, posted flyers, and in-person events.

CLIMATE ADVISORY TEAM (CAT)

The City formed a climate advisory team (CAT) to provide feedback and guidance to the planning team. The CAT membership provided wide representation of the community, including:

- Leavenworth Public Works Department
- Leavenworth Community Development Department
- Leavenworth Planning Commission
- Leavenworth Chamber of Commerce
- Cascade School District
- Small Businesses
- Real Estate & Land Development
- Fire District 3
- Community Members

The CAT meet three times during the planning process.

September 30, 2025 Agenda:

- Climate planning context and process
- Review of Leavenworth community assets
- Review of climate-exacerbated hazards and local impacts
- Community feedback on climate change and natural hazards

- Introduction to vulnerability and risk assessment

October 30, 2025 Agenda:

- Vulnerability assessment results and discussion
- Existing goal and policy analysis
- Climate resilience vision discussion

December 23, 2025 Agenda:

- Risk assessment methodology, results, and discussion
- Goal and policy setting

TRIBAL ENGAGEMENT

To support more efficient tribal engagement, the climate planning team collaborated with Chelan County's and other cities' climate element planning process for tribal engagement. Through tribal participation on the County's Climate Advisory Team and targeted discussions on specific topics, the planning team gathered information about climate impacts to cultural resources to share with the City of Leavenworth CAT and incorporate into the vulnerability and risk assessment. The Colville Tribe supported this method as it allowed them to reach a wide audience through a single effort. The draft Comprehensive Plan and climate element will also be shared with the Colville Tribe and Yakama Nation during the public comment period.

OVERBURDENED COMMUNITY AND VULNERABLE POPULATIONS ENGAGEMENT

The City of Leavenworth has an ongoing public engagement process that successfully engages with the whole community, including overburdened communities and vulnerable populations. The Comprehensive Plan PPP and Climate Element Supplement built upon these existing opportunities by focusing outreach during the popular Community Engagement Nights and Summer Block Party. These events include booths and activities from many community organizations, state and local agencies, and City departments, providing a variety of information to everyone who attends. The events are also an opportunity for the community to learn about and provide feedback on new projects and plans. The events attract a wide range of the community because they are centrally located and easy to access, the City provides dinner, and there are games and activities for children.

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