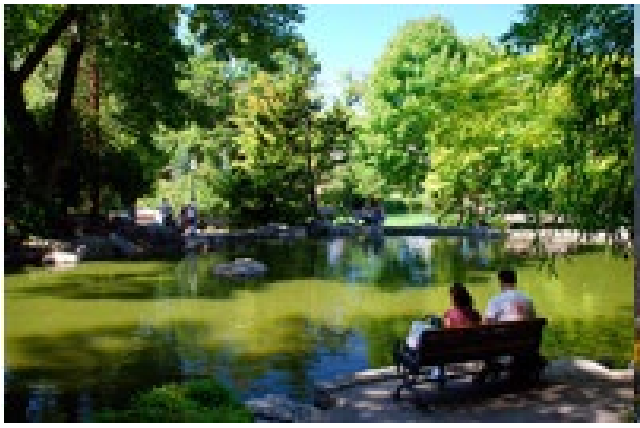
City of Ashland Addendum
to the Jackson County NHMP



Photos courtesy of Oregon State Archives

Effective: December XX, 2023 through December XX, 2028

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UNIVERSITY OF OREGON | Institute for Policy Research and Engagement

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Introduction

Purpose

This is an update of the Ashland addendum to the Jackson County Multi-Jurisdictional Natural Hazard Mitigation Plan (MNHMP, NHMP). This addendum supplements information contained in Volume I (Basic Plan) which serves as the NHMP foundation and Volume II (Appendices), which provide additional information. This addendum meets the following requirements:

- Multi-Jurisdictional **Plan Adoption** §201.6(c)(5),
- Multi-Jurisdictional **Participation** §201.6(a)(3),
- Multi-Jurisdictional **Mitigation Strategy** §201.6(c)(3)(iv) and
- Multi-Jurisdictional **Risk Assessment** §201.6(c)(2)(iii).

Updates to Ashland's addendum are further discussed throughout the NHMP and within Volume II, Appendix B, which provides an overview of alterations to the document that took place during the update process.

Ashland adopted their addendum to the Jackson County Multi-jurisdictional NHMP on [date], 2023. FEMA Region X approved the Jackson County NHMP on [date], 2023 and the City's addendum on [date], 2023. With approval of this NHMP, the City is now eligible for non-disaster and disaster mitigation project grants through [date-1], 2028.

NHMP Process, Participation and Adoption

This section of the NHMP addendum addresses 44 CFR 201.6(c)(5), *Plan Adoption* and 44 CFR 201.6(a)(3), *Participation.*

In addition to establishing a comprehensive city level mitigation strategy, the Disaster Mitigation Act of 2000 (DMA2K), and the regulations contained in Title 44 CFR Part 201, require that jurisdictions maintain an approved NHMP to receive federal funds for mitigation projects. Local adoption, and federal approval of this NHMP ensures that the city will remain eligible for non-disaster and disaster mitigation project grants. Ashland was included as an addendum in the 2012 and 2018 Jackson County NHMP process.

The Oregon Partnership for Disaster Resilience (OPDR) at the University of Oregon's Institute for Policy Research and Engagement (IPRE) collaborated with the Oregon Department of Emergency Management (OEM), Jackson County, and Ashland to update their NHMP. This project is funded through the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Grant Program. Members of the Ashland NHMP steering committee also participated in the County NHMP update process (Volume II, Appendix B).

By updating the NHMP, locally adopting it, and having it re-approved by FEMA, Ashland will maintain eligibility for FEMA Hazard Mitigation Assistance grant program funds.

The Jackson County NHMP and Ashland addendum are the result of a collaborative effort between residents, public agencies, non-profit organizations, the private sector, and regional organizations. A project steering committee guided the process of developing the NHMP.

Convener and Committee

The Ashland Emergency Management Coordinator served as the designated convener of the NHMP update and will take the lead in implementing, maintaining, and updating the addendum to the Jackson County NHMP in collaboration with the designated convener of the Jackson County NHMP (Emergency Manager).

Representatives from the City of Ashland steering committee met formally and informally, to discuss updates to their addendum (Volume II, Appendix B). The steering committee reviewed and revised the City's addendum, with a focus on the NHMP's risk assessment and mitigation strategy (action items).

This addendum reflects decisions made at the designated meetings and during subsequent work and communication with Jackson County Emergency Management and the OPDR. The changes are highlighted with more detail throughout this document and within Volume II, Appendix B. Other documented changes include a revision of the City's risk assessment and hazard identification sections, NHMP mission and goals, action items, and community profile.

The Ashland Steering Committee was comprised of the following representatives:

- Convener, Kelly Burns, Emergency Management Coordinator
- Chris Chambers, Ashland Fire Department
- Brian Hendrix, Fire Adapted Communities Coordinator
- Marshall Rasor, Deputy Ashland Fire Chief
- Ralph Sartain, Ashland Fire Chief

The steering committee served as the local review body for the NHMP's development.

NHMP Implementation and Maintenance

The City Council will be responsible for adopting the Ashland addendum to the Jackson County NHMP. This addendum designates a steering committee and a convener to oversee the development and implementation of action items. Because the City addendum is part of the County's multi-jurisdictional NHMP, the City will look for opportunities to partner with the County. The City's steering committee will convene after re-adoption of the Ashland NHMP addendum on an annual schedule. The County is meeting on a semi-annual basis and will provide opportunities for the cities to report on NHMP implementation and maintenance during their meetings. The City's Fire Chief will serve as the convener and will be responsible for assembling the steering committee. The steering committee will be responsible for:

- Reviewing existing action items to determine suitability of funding;

- Reviewing existing and new risk assessment data to identify issues that may not have been identified at NHMP creation;
- Educating and training new steering committee members on the NHMP and mitigation actions in general;
- Assisting in the development of funding proposals for priority action items;
- Discussing methods for continued public involvement; and
- Documenting successes and lessons learned during the year.

The convener will also remain active in the County's implementation and maintenance process (Volume I, Section 4).

The steering committee will be responsible for activities outlined in Volume I, Section 4.

The City will utilize the same action item prioritization process as the County (Volume I, Section 4 and Volume II, Appendix D).

Implementation through Existing Programs

Many of the Natural Hazard Mitigation Plan's recommendations are consistent with the goals and objectives of the City's existing plans and policies. Where possible, Ashland will implement the NHMP's recommended actions through existing plans and policies. Plans and policies already in existence have support from residents, businesses, and policy makers. Many land-use, comprehensive, and strategic plans get updated regularly, allowing them to adapt to changing conditions and needs. Implementing the NHMP's action items through such plans and policies increases their likelihood of being supported and implemented.

Ashland's acknowledged comprehensive plan is the City of Ashland Comprehensive Plan (1982, updated 2021). The Oregon Land Conservation and Development Commission first acknowledged the plan in 1983. The City implements the plan through the Community Development Code.

Ashland currently has the following plans that relate to natural hazard mitigation. For a complete list visit the City's website:

- Comprehensive Plan (1982, amended 2021)
- Municipal Codes
  - Chapter 2.26 Ashland Wildfire Safety Commission
  - Section 14.06 Water Curtailment
  - Section 15.10 Flood Damage Prevention Regulations
- Community Development Plans
- Building Codes and Standards: Oregon Structural Specialty Code (Commercial) and Oregon Residential Specialty Code.
- Capital Improvement Plan
- Emergency Operations Plan
- Transportation System Plan (2012, update underway)
- Hosler Dam Emergency Action Plan and Early Warning System
- Community Wildfire Protection Plan (2004)

- Ashland Forest Plan (2016)
- Ashland Forest Plan Climate Adaptation Addendum (2023)
- Ashland Climate and Energy Action Plan (2017)
- Water Management Conservation Plan (2013)
- City of Ashland Hazard Mitigation, Green Infrastructure and Low Impact Development (2017) (Volume II, Appendix G)

Other plans:

- Oregon Shakespeare Festival Long Range Plan (includes information on smoke from wildfires)
- Ashland Chamber of Commerce: Business Continuity Plan
- Southern Oregon University: Natural Hazard Mitigation Plan (2012)

Mitigation Strategy

This section of the NHMP addendum addresses 44 CFR 201.6(c)(3(iv), *Mitigation Strategy*.

The City's mitigation strategy (action items) was first developed during the 2012 NHMP planning process and revised during the 2018 update. During this process, the steering committee assessed the City's risk, identified potential issues, and developed a mitigation strategy (action items).

During the 2023 update process the City re-evaluated their mitigation strategy (action items). During this process action items were updated, noting what accomplishments had been made and whether the actions were still relevant; any new action items were identified at this time (see Volume II, Appendix B for more information on changes to action items).

Mitigation Successes

Talent has several examples of hazard mitigation including the following projects funded through FEMA Hazard Mitigation Assistance and the Oregon Infrastructure Finance Authority's Seismic Rehabilitation Grant Program[1].

FEMA Funded Mitigation Successes

- 2021: PDM18 – Wildfire Mitigation Project (vegetative management, retrofitting structures) ($4,000,000)

Seismic Rehabilitation Grant Program Mitigation Successes

- 2023:Ashland High School Humanities Building ($2,500,000) - Ongoing
- 2021: Walker Elementary School Gymnasium ($1,834,325) - Completed
- 2019: Walker Elementary Main Building/Library ($2,497,550) - Completed

[1] The Seismic Rehabilitation Grant Program (SRGP) is a state of Oregon competitive grant program that provides funding for the seismic rehabilitation of critical public buildings, particularly public schools, and emergency services facilities.

The City of Ashland Public Works Department maintains a seismic vulnerability report of public facilities. In addition, Southern Oregon University (SOU) has information on the seismic vulnerability of their infrastructure. SOU has retrofitted several structures on their campus, see their Natural Hazard Mitigation Plan for more information.

Action Items

Table AA-3 documents the title of each action along with, the lead organization, partners, timeline, cost, and potential funding resources.

Table AA-1 Ashland Priority Action Items

Action Item #	Mitigation Actions	Potential Funding Resources	Lead Department(s)	Partners	Timeline (S/M/L/O)	Cost (L/M/H)
Multi-hazard						
1.1	Continue City's Community Emergency Response Team (CERT) trainings and outreach.	Local Funding Resources, DLCD	Ashland Fire and Rescue	Ashland CERT, Jackson County EM	O	L
1.2	Provide emergency kits to local school district staff and continue to maintain emergency kits already distributed to City employees.	Local Funding Resources, School Resources	Ashland Fire and Rescue	Ashland School District	O	L
1.3	Continue to investigate how to improve interoperability for Southern Oregon University's audio alert system.	Local Funding Resources, Oregon University System, PDM, HMGP	Southern Oregon University	Jackson County Emergency Management	M	L
Air Quality						
See priority actions and multi-hazard actions for applicable mitigation strategies.						
Drought						
See priority actions and multi-hazard actions for applicable mitigation strategies.						
Earthquake						
4.1	**Relocate the Emergency Operations Center (EOC) to Southern Oregon University, as agreed upon by the university and local school district. Continue to train city, school district, and university staff to jointly operate EOC.**	**Local Funding Resources, SRGP, PDM, HMGP**	**Ashland Fire and Rescue**	**Ashland Fire and Rescue, Southern Oregon University**	**O**	**M**

Action Item #	Mitigation Actions	Potential Funding Resources	Lead Department(s)	Partners	Timeline (S/M/L/O)	Cost (L/M/H)
4.2	**Implement structural and non-structural retrofits to City Hall.**	**Local Funding Resources, SRGP**	**Ashland Fire & Rescue**	**City of Ashland, Chamber of Commerce, Ashland School District, Southern Oregon University, Oregon Shakespeare Festival**	**L**	**H**
4.3	Continue to work with natural gas providers to investigate natural gas shut-off valves at the City's facilities.	Local Funding Resources, AVISTA	Ashland Public Works	AVISTA	L	L
4.4	Conduct seismic risk assessment of high-risk public and private facilities in the city.	Local Funding Resources, PDM, HMGP	Ashland Fire and Rescue	City of Ashland, Chamber of Commerce, Ashland School District, Southern Oregon University, Oregon Shakespeare Festival	M	L
Extreme Heat Event						
See priority actions and multi-hazard actions for applicable mitigation strategies.						
Flood						
6.1	Review the City of Ashland Flood Plan to ensure corrective and preventative measures for reducing flooding and flood damage are current.	**General Fund, DLCD Technical Assistance Grants**	**City Planning**	**Public Works**	**L**	**L**

Action Item #	Mitigation Actions	Potential Funding Resources	Lead Department(s)	Partners	Timeline (S/M/L/O)	Cost (L/M/H)
6.2	Develop Increased Floodwater Storage Project along Bear and Ashland Creek. Restore wetlands and use techniques like floodplain benching along Bear and Ashland Creek to increase floodwater storage capacity and reduce flood risk.	Local Funding Resources, DLCD, FEMA, ASFPM	Ashland Public Works	DLCD, DEQ	L	H
6.3	Develop a City-led "Green Streets" Program. Expand the use of Green Infrastructure/Low Impact Development (GI/LID) best management practices (BMPs) in development codes such as bioswales in city owned right-of-way to minimize local and downstream flooding.	Local Funding Resources, PDM, HMGP, DEQ	Ashland Community Development	Ashland Public Works, Rogue Valley Sewer Services	L	M
Landslide						
7.1	**Complete design of the City's new Water Treatment Plant and seek funding for construction.**	**Local Funding Resources, PDM, HMGP**	**Ashland Public Works**	**Ashland Community Development**	**M**	**L**
Severe Weather						
See priority actions and multi-hazard actions for applicable mitigation strategies.						
Volcano						
See priority actions and multi-hazard actions for applicable mitigation strategies.						
Wildfire						
10.1	**Continue Ashland's defensible space initiative.**	**Local Funding Resources, ODF, PDM, HMGPWF**	**Ashland Fire and Rescue**	**Private Contractors**	**M**	**L**

Action Item #	Mitigation Actions	Potential Funding Resources	Lead Department(s)	Partners	Timeline (S/M/L/O)	Cost (L/M/H)
10.2	**Continue fuel reduction efforts through the Ashland Forest Resiliency Project.**	**Local funding resources, ODF**	**Ashland Fire and Rescue**	**The Nature Conservancy, USFS, Lomakatsi Restoration Project**	**O**	**M**
10.3	Sustain Ashland Firewise groups, as funding allows.	Local Funding Resources, Firewise, ODF	Ashland Fire and Rescue	HOAs, Oregon Department of Forestry	O	L
10.4	Pursue funding and/or support for responder trainings and public educational offerings related to wildfire evacuations.	Local Funding Resources, HMGP, ODF	Ashland Fire and Rescue	Jackson County EM, JCFD#3, Oregon Department of Forestry	O	M

Source: Ashland NHMP Steering Committee, updated 2023
Cost: L – Low (less than $50,000), M - Medium ($50,000-$100,000), H - High (more than $100,000)
Timing: Ongoing (continuous), Short (1-2 years), Medium (3-5 years), Long (5 or more years)
Priority Actions: Identified with **bold** text and **orange** highlight.

Green Infrastructure and Low Impact Development

The Institute for Policy Research and Engagement (IPRE) team worked with the City of Ashland, regional stakeholders, and state agency partners to develop and workshop proposed natural hazard mitigation plan (NHMP) action items that utilize green infrastructure (GI) and low impact development (LID) best management practice (BMPs). The proposed action items are intended to reduce risk from natural hazards while providing important water quality, habitat, and community benefits.

What is GI and LID?

Green infrastructure (GI) and low impact development (LID) are cost-effective and resilient approaches to stormwater and associated natural hazard management.[2] GI and LID techniques can be used to manage weather and climate impacts in ways that also provide many environmental and community benefits. These strategies are traditionally applied to stormwater management for limiting flow, reducing pollution, and increasing the environmental health of receiving waterways.

LID and GI represent a wide range of tools and techniques that can be applied at the site, neighborhood, and regional/watershed scales. In general, the goal of GI and LID best management practices is to minimize impervious area, limit the disturbance of undeveloped lands, prevent runoff from landscapes and hardscape area, and protect land and ecosystems.[3]

Figure AA-1 Green Infrastructure – Low Impact Development Continuum

Source: U.S. Environmental Protection Agency.

Low impact development (LID) refers to systems and practices that use or mimic natural processes that result in the infiltration, evapotranspiration, or use of stormwater to protect

[2] Using Low Impact Development and Green Infrastructure to Get Benefits from FEMA Programs. EPA. https://www.epa.gov/nps/using-low-impact-development-and-green-infrastructure-get-benefits-fema-programs

[3] Low Impact Development in Western Oregon: A Practical Guide for Watershed Health. OR DEQ. http://www.oregon.gov/deq/wq/tmdls/Pages/TMDLs-LID.aspx

water quality and associated aquatic habitat.[4] Low impact development is most applied at the site or neighborhood scale. There are an extensive number of LID best management practices whose use depends on topological, environmental, and geological conditions. Common approaches include the use of rain gardens, bioswales, tree boxes, engineered soils, and stormwater planters.

Green Infrastructure (GI) uses natural and engineered practices to mimic, protect or restore natural processes required to manage water and create healthier urban environments.[5] Green infrastructure is most applied at the neighborhood and regional/watershed scale. Green infrastructure best management approaches can include the protection and enhancement of landscapes such as watersheds, wetlands, and floodplains. Constructed wetlands, restored, and reconnected floodplains and stream buffers are all examples of green infrastructure best management practices.

The City of Ashland is already a leader in applying GI/LID strategies to stormwater collection, conveyance, storage, and treatment. Collectively, existing GI/LID based projects help reduce flood impacts at the local level.

The Overlap of GI and LID with Natural Hazard Mitigation

GI and LID stormwater management best practices seek to treat urban stormwater onsite to improve water quality, provide habitat, and manage runoff. While these benefits are perhaps the most widely recognized, there is increasing interest in a much wider range of co-benefits associated with GI and LID. These include natural hazard mitigation, lower lifetime infrastructure costs, improved community livability, reduced energy use, and improved air quality. GI and LID techniques can reduce urban heat island effects, improve plant health during droughts reducing fire risks, stabilize soils in landslide prone areas, mitigate localized flooding, and reduce downstream flooding occurrences and severity.

Table AA-2 Co-Benefits of GI and LIDTable AA-2 illustrates some of the co-benefits of a GI or LID project. Full circles indicate strong positive overlaps, while half circles indicate partial overlap.

FEMA and GI/LID

In recent years, FEMA has acknowledged the risks and vulnerabilities associated with changing climate trends. Specifically siting “more intense storms, frequent heavy precipitation, heat waves, drought, extreme flooding and higher sea levels,”[6] FEMA is focusing efforts on providing information that can help communities manage climate related risks. “FEMA’s focus on risk management has expanded to anticipate climate changes and to plan and implement strategy for program development in support of climate resilient infrastructure. FEMA now integrates

[4] Urban Runoff: Low Impact Development. EPA. https://www.epa.gov/nps/urban-runoff-low-impact-development
[5] What is Green Infrastructure? EPA. https://www.epa.gov/green-infrastructure/what-green-infrastructure
[6] Climate Change. FEMA. https://www.fema.gov/climate-change

climate change adaptation into planning for future risk, programs, policies, and operations to strengthen the nation's resilience."[7]

Table AA-2 Co-Benefits of GI and LID

GI and LID Example Best Management Practices	Natural Hazard Mitigation			Co-Benefits		
	Flood	Wildfire	Landslide	Water Quality	Community Benefits	Habitat
Minimize Impervious Area:						
Share parking spaces	●		●	●	●	◡
Minimize pavement widths						
Minimize front yard setbacks						
Share driveway						
Minimize building footprint(s)						
Minimize roadway cross section(s)						
Limit Disturbance of Undeveloped Land:						
Sequence construction schedule	◡		●	◡	●	◡
Conserve fast(er) draining soils						
Cluster development						
Preserve/protect trees						
Minimize foundation(s)						
Minimize grading						
Prevent Runoff from Landscape and Hardscape Areas:						
Rain garden(s)	●	◡	●	●	●	◡
Bioswale(s)						
Bio-retention (infiltration) basin						
(Dry) Detention basin						
Tree and landscape planting(s)						
Remove existing pavement						
Contained planters						
Vegetated roofs (green roofs)						
Porous Pavement						
Protect Land and Ecosystems:						
Conserve open space	●	●	◡	●	●	●
Protect/preserve wetlands						
Construct wetlands						
Protect/preserve riparian areas						
Maintain/enhance urban forest (forest parks)						

Source: Best Management Practice from Low Impact Development in Western Oregon: A Practical Guide for Watershed Health with CSC additions. Co-Benefit scoring from CSC research and should be interpreted as opportunities for further investigation.

Pre-disaster mitigation planning broadly focuses on reducing hazard exposure to people and property. GI and LID best management practices support FEMA goals through the use of strategies and approaches that protect, restore and mimic natural systems. According to a recent FEMA report on innovation in hazard mitigation projects, "Implementation of LID/GI practices can help mitigate flood events by increasing the ability of the landscape to store water on site. Infiltration of these stored waters can also mitigate the effects of drought by

[7] Innovative Drought and Flood Mitigation Projects, Final Report, 2017. FEMA. https://www.fema.gov/media-library/assets/documents/129691

replenishing water supply aquifers and enhancing usable water supply."[8] The report goes on to state, "GI can be used at a wide range of landscape scales in place of or in addition to, more traditional stormwater control elements to support the principles of LID (USEPA 2014c). Both LID and GI utilize best management practices (BMPs) that can be combined in a BMP Treatment Train to enhance benefits and reduce costs."

Risk Assessment

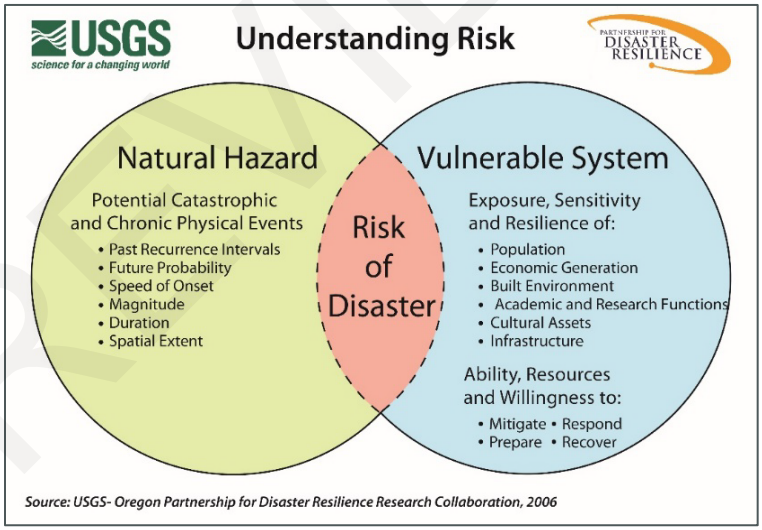
This section of the NHMP addendum addresses 44 CFR 201.6(b)(2) - Risk Assessment. In addition, this chapter can serve as the factual basis for addressing Oregon Statewide Planning Goal 7 – Areas Subject to Natural Hazards.

Assessing natural hazard risk has three phases:

- Phase 1: Identify hazards that can impact the jurisdiction. This includes an evaluation of potential hazard impacts – type, location, extent, etc.
- Phase 2: Identify important community assets and system vulnerabilities. Example vulnerabilities include people, businesses, homes, roads, historic places, and drinking water sources.
- Phase 3: Evaluate the extent to which the identified hazards overlap with or have an impact on, the important assets identified by the community.

The local level rationale for the identified mitigation strategies (action items) is presented herein and within Volume I, Sections 2 and 3. The risk assessment process is graphically depicted in Figure AA-2. Ultimately, the goal of hazard mitigation is to reduce the area of risk, where hazards overlap vulnerable systems.

Figure AA-2 Understanding Risk



[8] Ibid.

Hazard Analysis

The Ashland steering committee developed their hazard vulnerability assessment (HVA), using their previous HVA and the County's HVA (Volume II, Appendix C) as a reference. Changes from the County's HVA were made where appropriate to reflect distinctions in vulnerability and risk from natural hazards unique to Ashland, which are discussed throughout this addendum.

Table AA-3 shows the HVA matrix for Ashland listing each hazard in order of rank from high to low. For local governments, conducting the hazard analysis is a useful step in planning for hazard mitigation, response, and recovery. The method provides the jurisdiction with a sense of hazard priorities but does not predict the occurrence of a particular hazard.

Three chronic hazards (wildfire, emerging infectious disease, and winter storm) and one catastrophic hazard (Cascadia Subduction Zone earthquake) rank as the top hazard threats to the City (Top Tier). Drought, windstorm, extreme heat, air quality, landslide, and flood hazards comprise the next highest ranked hazards (Middle Tier), while the crustal earthquake and volcanic event hazards comprise the lowest ranked hazards (Bottom Tier).

Table AA-3 Hazard Analysis Matrix – Ashland

Hazard	History	Vulnerability	Maximum Threat	Probability	Total Threat Score	Hazard Rank	Hazard Tiers
Wildfire	18	45	100	70	233	#1	Top Tier
Emerging Infectious Disease	16	40	100	49	205	#2	
Earthquake - Cascadia	2	50	100	49	201	#3	
Winter Storm	20	50	60	70	200	#4	
Drought	20	50	60	63	193	#5	Middle Tier
Windstorm	20	50	50	70	190	#6	
Extreme Heat Event	20	25	70	70	185	#7	
Air Quality	18	40	60	63	181	#8	
Landslide	10	35	80	56	181	#9	
Flood	20	30	60	70	180	#10	
Earthquake - Crustal	2	25	70	21	118	#11	Bottom Tier
Volcanlc Event	2	5	50	7	64	#12	

Source: Ashland NHMP Steering Committee, 2023.

Community Characteristics

Table AA-4 and the following section provides information on City specific demographics and characteristics. For additional information on the characteristics of Ashland, in terms of geography, environment, population, demographics, employment, and economics, as well as housing and transportation, see Volume III, Appendix 2. Many of these community characteristics can affect how natural hazards impact communities and how communities choose to plan for natural hazard mitigation. Considering the City specific assets during the planning process can assist in identifying appropriate measures for natural hazard mitigation.

Ashland is in Jackson County in southwestern Oregon. It lies along Interstate 5 approximately 16 miles (26 km) north of the California border and near the south end of the Rogue Valley,

southeast of the City of Medford. The City and most of Jackson County is within the Rogue watershed. The city is the home of Southern Oregon University and the Oregon Shakespeare Festival.

Ashland experiences a relatively mild climate with four distinct seasons that comes from its position on the west coast of North America and within the mountains of the region. The city is at approximately 2000 feet above sea level and is dominated by Mt Ashland, part of the Siskiyou Mountain Range, which rises to 7500 feet above Ashland to the south. The Cascades Range rises to the north and east. As a result of its location, Ashland has a climate somewhat intermediate to central California and northern Oregon. Ashland averages about 19.5 inches of rain.[9] Most of the rain (17 inches) falls between October and May. While the surrounding mountains receive plentiful snow, Ashland itself sees less than 0.5 inches annually.

Population and Income

The City has grown steadily since its incorporation in 1874 and has an area today of 6.64 square miles. Between 2016 and 2023 the City grew by 2,780 people (13%) to a population of 21,544, and median household income increased by about 19%. Most of the population is White/Caucasian (89%) and about 10% of the population is Hispanic or Latino. The poverty rate is 16% (25% of children under 18), 8% do not have health insurance, and 49% of renters pay more than 30% of their household income on rent (36% for owners). Over half (57%) of the population has a bachelor's degree or higher. Approximately 10% of the population lives with a disability (19% of population 65 and older), and 46% are either below 18 (16%) or over 65 (30%) years of age. About 18% of the population are 65 or older and living alone and 6% are single parents.

Transportation, Housing, and Infrastructure

In the City of Ashland, transportation has played a major role in shaping the community. From the railroad tracks to the development of Interstate 5, Highway 99 and Highway 66, Ashland's commercial areas developed along primary routes and residential development followed nearby.

Today, mobility plays an important role in Ashland and the daily experience of its residents and businesses as they move from point A to point B. In addition to Hwy 99, the City also has two other highways within its borders: Highway 66 and Interstate 5. The current railroad system is serviced through the Union Pacific Railroad system and the Central Oregon and Pacific Railroad (CORP) route. This complements the established Rogue Valley Transportation District (RVTD) and the series of transit stops located within Ashland. In addition, the City operates several recreational trails within City limits that provide alternative routes for pedestrians and bicyclists in the northwest and southwest regions of the City (around the Ashland Creek and Bear Creek corridors).[10]

[9] NOAA. National Centers for Environmental Information. Summary of Monthly Normals (1991-2010). Ashland, OR US USC00350304. https://www.ncei.noaa.gov/access/services/data/v1?dataset=normals-monthly-1991-2020&startDate=0001-01-01&endDate=9996-12-31&stations=USC00350304&format=pdf

[10] City of Ashland Park and Recreation Finder, http://gis.ashland.or.us/AshlandParksandRec/

By far, motor vehicles represent the dominant mode of travel through and within Ashland. Thirty-six percent (36%) of renters and 67% of owners have two or more vehicles (10% of renters do not have access to a car). Most workers drive alone to work (59%); however, 14% either walk or use a bicycle, and 18% work at home.

The City of Ashland includes a diversity of land uses but is zoned primarily residential. The city's Comprehensive Plan and map identifies land use needs within the city and its urban growth boundary). Since the previous NHMP (2018) the city has not annexed any land. Three-quarters of housing units are single-family, 20% are multifamily, and just 2% are mobile homes. One-third of homes (36%) were built before 1970. Newer homes are more likely to be built to current seismic, flood, wildfire, and other hazard standards. Half of housing units are owner occupied, 39% are renter occupied, while 5% are seasonal homes, and 6% are vacant. Due to initial firefighting efforts less than one dozen structures were damaged in the Almeda Fire. New development has complied with the standards of the Oregon Building Code and the city's development code including their floodplain ordinance.

Economy

A diverse range of businesses have chosen to locate in Ashland. Traditionally, Ashland has built its economy on a resource base of timber, favorable climate, attractive landscape, cultural attractions, a well-educated labor force and education. In addition, Ashland's location on Interstate 5 and the Central Oregon and Pacific Railroad, its proximity to the Medford Airport, and its own local airport give it market access that is more favorable than usual for a rural town. The Oregon Shakespeare Festival and Southern Oregon University each create unique economic opportunities that contribute to the strength of the economy.

According to the economic profile of the City's Comprehensive Plan, Ashland finds their main economic drivers in the sectors of tourism, manufacturing, and commercial retail.[11] About 51% of the resident population 16 and over is in the labor force (10,889 people) and are employed in a variety of occupations including professional and related (37%), management, business, and financial (19%), office and administrative (10%), food preparation and serving (9%), and building and sales and related (8%) occupations.

Most workers residing in the city (58%, 4,072 people) travel outside of the city for work primarily to Medford and surrounding areas.[12] A significant population of people travel to the city for work, (66% of the workforce, 5,599 people) primarily from Medford, Talent, and surrounding areas.[13]

[11] City of Ashland Comprehensive Plan, Economy Element (2016) http://www.ashland.or.us/Files/Ashland_Economy_Element.pdf

[12] U.S. Census Bureau. LEHD Origin-Destination Employment Statistics (2002-2020). Longitudinal-Employer Household Dynamics Program, accessed on August 17, 2023 at https://onthemap.ces.census.gov.

[13] Ibid.

Table AA-4 Community Characteristics

Population Characteristics		
2016 Population Estimate	20,620	
2021 Population Estimate	21,554	
2040 Population Forecast*	24,334	
Race		
American Indian and Alaska Native		< 1%
Asian		2%
Black/ African American		1%
Native Hawaiian and Other Pacific Islander		1%
White		89%
Some Other Race		1%
Two or More Races		6%
Hispanic or Latino/a (of any race)		10%
Limited or No English Spoken	54	1%
Vulnerable Age Groups		
Less than 5 Years	673	3%
Less than 18 Years	2,757	13%
65 Years and Older	5,740	27%
85 Years and Older	647	3%
Age Dependency Ratio		66.1
Disability Status (Percent age cohort)		
Total Disabled Population	2,032	10%
Children (Under 18)	42	2%
Working Age (18 to 64)	908	7%
Seniors (65 and older)	1,082	19%

Household Characteristics		
Housing Units		
Single-Family (includes duplexes)	8,826	78%
Multi-Family	2,233	20%
Mobile Homes (includes RV, Van, etc.)	214	2%
Household Type		
Family Household	4,965	49%
Married couple (w/ children)	1,023	10%
Single (w/ children)	582	6%
Living Alone 65+	1,810	18%
Year Structure Built		
Pre-1970	4,037	36%
1970-1989	3,342	30%
1990-2009	2,916	34%
2010 or later	978	9%
Housing Tenure and Vacancy		
Owner-occupied	5,616	50%
Renter-occupied	4,436	39%
Seasonal	518	5%
Vacant	703	6%
Vehicles Available (Occupied Units)		
No Vehicle (owner occupied)	90	2%
Two+ vehicles (owner occupied)	3,779	67%
No Vehicle (renter occupied)	437	10%
Two+ vehicles (renter occupied)	1,597	36%

Income Characteristics		
Households by Income Category		
Less than $15,000	1,174	12%
$15,000-$29,999	1,711	17%
$30,000-$44,999	1,103	11%
$45,000-$59,999	833	8%
$60,000-$74,999	903	9%
$75,000-$99,999	1,174	12%
$100,000-$199,999	2,182	22%
$200,000 or more	972	10%
Median Household Income		$63,641
Gini Index of Income Inequality		0.43
Poverty Rates (Percent age cohort)		
Total Population	3,332	16%
Children (Under 18)	664	25%
Working Age (18 to 64)	2,287	19%
Seniors (65 and older)	381	7%
Housing Cost Burden (Cost > 30% of household income)		
Owners with a Mortgage	1,348	24%
Owners without a Mortgage	684	12%
Renters	2,166	49%

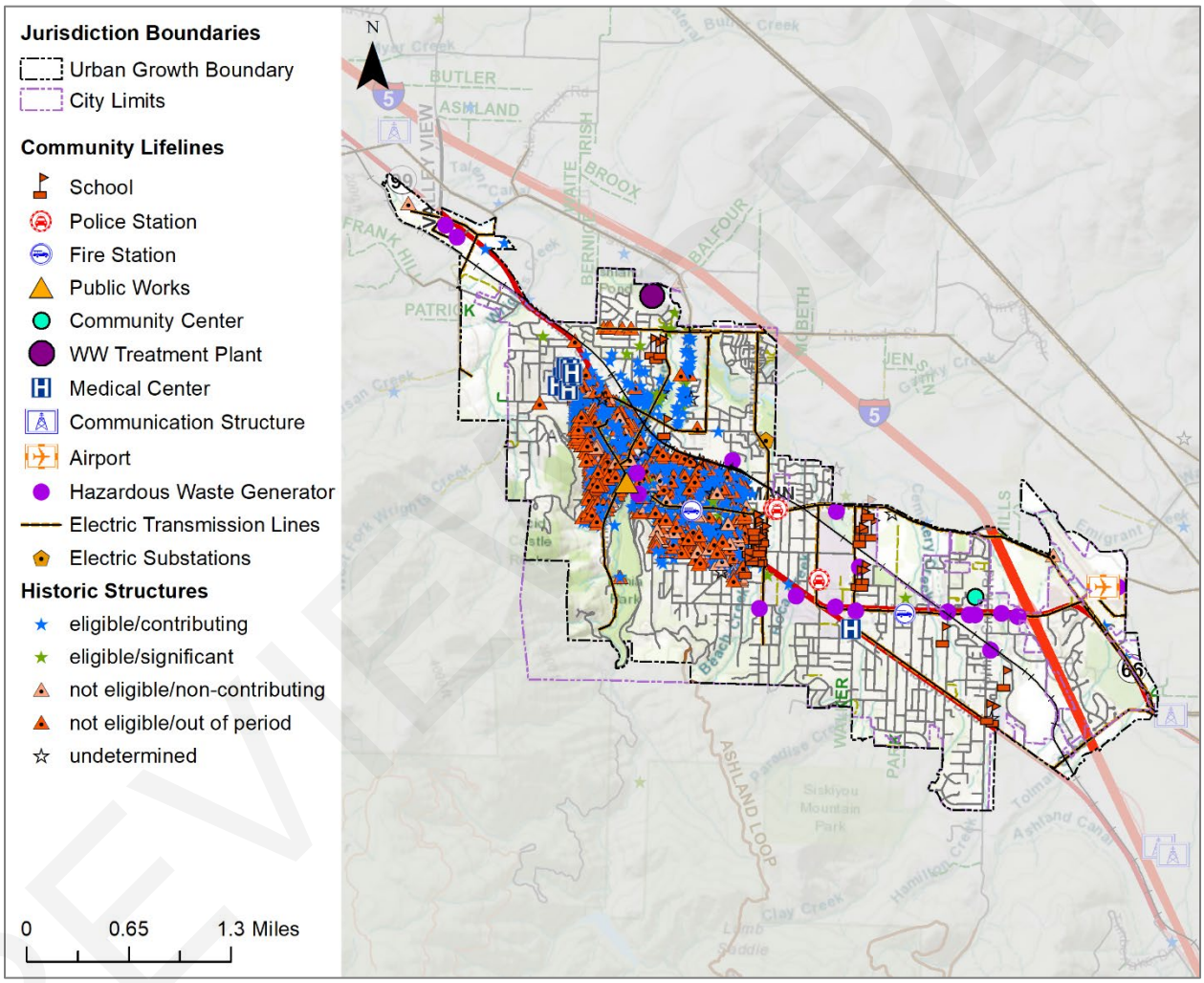
Employment Characteristics		
Labor Force (Population 16+)		
In labor Force (% Total Population)	10,889	51%
Unemployed (% Labor Force)	531	5%
Occupation (Top 5) (Employed 16+)		
Professional & Related	3,790	37%
Management, Business, & Financial	2,003	19%
Office & Administrative	1,059	10%
Food Preparation & Serving	917	9%
Sales & Related	841	8%
Health Insurance		
No Health Insurance	1,640	8%
Public Health Insurance	9,113	43%
Private Health Insurance	14,258	67%
Transportation to Work (Workers 16+)		
Drove Alone	6,067	59%
Carpooled	594	6%
Public Transit	163	2%
Motorcycle	0	0%
Bicycle/Walk	1,381	14%
Work at Home	1,877	18%

Source: U.S. Census Bureau, 2017-2021 American Community Survey 5-Year Estimates; Portland State University, Population Research Center, "Annual Population Estimates, Table 4", 2016 and 2021; and"Population Forecasts, Summary Tab", 2022.
Note: * = Population forecast within UGB

Community Assets

This section outlines the resources, facilities, and infrastructure that, if damaged, could significantly impact the public safety, economic conditions, and environmental integrity of Ashland. Community lifelines and historic structures in Ashland are shown in Figure AA-3 and Table AA-5. FEMA developed the Community Lifelines construct for objective-based response to prioritize the rapid stabilization of these facilities after a disaster. Mitigating these facilities will increase the community's resilience.

Figure AA-3 Ashland Community Lifelines and Historic Structures



Source: Oregon Partnership for Disaster Resilience, Oregon Department of Geology and Mineral Industries

Table AA-5 Ashland Community Lifelines

Facility Name	Community Lifeline Category	Lifeline Type	Earthquake-Liquefaction Hazard	Flood Hazard	Landslide Hazard	Wildfire Hazard
Angus Bowmer Theater	hazardous materials	hazardous waste producer	none	minimal	moderate	in WHZ
Arco Products Co 4479	hazardous materials	hazardous waste producer	none	minimal	low	in WHZ
Ashland Comm Hospital	hazardous materials	hazardous waste producer	none	minimal	low	in WHZ
Ashland School Dist. #5 - Maintenance	hazardous materials	hazardous waste producer	none	minimal	low	in WHZ
Campus Cleaners	hazardous materials	hazardous waste producer	none	minimal	moderate	in WHZ
Chevron USA Inc.	hazardous materials	hazardous waste producer	moderate	minimal	low	in WHZ
Miller Paint Company Inc.	hazardous materials	hazardous waste producer	low	minimal	moderate	in WHZ
Steve Green Aircraft Refinishing	hazardous materials	hazardous waste producer	low	minimal	high	in WHZ
Union Pacific Railroad	hazardous materials	hazardous waste producer	none	minimal	low	in WHZ
USDOI FWS National Forensics Lab	hazardous materials	hazardous waste producer	none	minimal	low	in WHZ
Sherwin Williams	hazardous materials	hazardous waste producer	none	minimal	low	in WHZ
Ashland Center - Womens Health	health and medical	medical facility	none	minimal	low	in WHZ
Ashland Community Hospital	health and medical	medical facility	none	minimal	moderate	in WHZ
Ashland Orthopedic Associates	health and medical	medical facility	none	minimal	low	in WHZ
Ashland Pediatrics	health and medical	medical facility	none	minimal	low	in WHZ
Center For Internal Medicine	health and medical	medical facility	none	minimal	low	in WHZ
Planned Parenthood-Ashland Health Center	health and medical	medical facility	none	minimal	low	in WHZ
Retina & Vitreous Center - South	health and medical	medical facility	none	minimal	low	in WHZ
Ashland Family YMCA	safety and security	community center	none	minimal	moderate	in WHZ
Southern Oregon University	safety and security	school	none	minimal	moderate	in WHZ
Ashland Fire And Rescue	safety and security	fire station	none	minimal	low	in WHZ
Ashland Fire And Rescue Station 2	safety and security	fire station	none	minimal	low	in WHZ
Ashland High School	safety and security	school	none	minimal	moderate	in WHZ
Ashland Middle School	safety and security	school	none	minimal	moderate	in WHZ
Ashland Police Department	safety and security	police station	none	minimal	low	in WHZ
Bellview Elementary School	safety and security	school	none	minimal	moderate	in WHZ
Children's World Bilingual Montessori Pre & Kindergarden	safety and security	school	none	minimal	moderate	in WHZ
Helman Elementary School	safety and security	school	none	minimal	moderate	in WHZ
John Muir Outdoor School	safety and security	school	none	minimal	low	in WHZ
Lithia Springs School	safety and security	school	none	minimal	low	in WHZ
Pilot Rock Christian School	safety and security	school	none	minimal	low	in WHZ
Southern Oregon University Campus Public Safety	safety and security	school	none	minimal	moderate	in WHZ
The Siskiyou School	safety and security	school	none	minimal	moderate	in WHZ
Walker Elementary School	safety and security	school	none	minimal	low	in WHZ
Ashland Municipal Airport	transportation	airport	none	minimal	low	in WHZ
Ashland Public Works Department	transportation	public works	none	minimal	low	in WHZ

Source: Oregon Department of Geology and Mineral Industries, Ashland NHMP Steering Committee; WHZ = Wildland Hazard Zone (cliick link for more information)

Critical Facilities

Facilities that are critical to government response and recovery activities (i.e., life, safety, property, and environmental protection). These facilities include: 911 Centers, Emergency Operations Centers, Police and Fire Stations, Public Works facilities, sewer and water facilities, hospitals, bridges, roads, shelters, and more. Facilities that, if damaged, could cause serious secondary impacts may also be considered "critical." A hazardous material facility is one example of this type of critical facility.

Fire Stations:

- Ashland Fire & Rescue Stations 1 & 2

Law Enforcement:

- Ashland Police Department

Public Works:

- Public Works and Street Division Building
- Parks and Recreation Building

Private:

- Ashland Shopping Center
- Ashland Propane
- Food Bank

Hospitals/Immediate Medical Care Facilities:

- Asante Ashland Community Hospital
- Southern Oregon University – Health Center

City Buildings:

- Ashland Senior Center (Gathering Point)
- Ashland Planning Division
- Ashland Library (County)
- Ashland Community Development (ComDev)
- Municipal Court

Essential Facilities

Facilities that are essential to the continued delivery of key government services and/or that may significantly impact the public's ability to recover from the emergency. These facilities may include City buildings such as the Public Services Building, the City Hall, and other public facilities such as schools.

Hospitals/Immediate Medical Care Facilities:

- Rogue Community Health - Ashland
- Asante Physician Partners
- Valley Immediate Care
- La Clinica Mobile Unit (Based in Phoenix)

Public Schools:

- Ashland High School
- Ashland Middle School
- Bellview School
- Helman Elementary School
- John Muir School
- Walker Elementary School
- Willow Wind Community Learning Center (CLC)

Private Schools:

- Children's World Bilingual Montessori Pre-School and Kindergarten
- Lithia Springs School
- Pilot Rock Christian School
- The Siskiyou School

Potential Shelter Sites:

- All Ashland Schools (Red Cross designates Middle and High Schools)
- Ashland Bible Church
- Ashland Christian Fellowship
- Ashland GracePoint
- Bellview Christian Church
- Christian Church of Ashland
- Church of Christ
- Family Life Bible Church
- First Baptist Church of Ashland
- First Methodist Church
- First Presbyterian Church
- Grace Lutheran Church
- Newman Center
- Trinity Episcopal Church
- Ashland Gracepoint Church of the Nazarene
- Ashland Foursquare Church
- Ashland SDA Church
- Our Lady of the Mountain Parish
- Calvary Baptist Church
- Clay Street Community Church
- First Congressional United Church of Christ
- Green Springs Christian Fellowship
- Nevada Street Church of Christ
- Alliance Bible Chapel
- Faith Tabernacle Church
- National Guard Armory
- YMCA

Infrastructure:

Infrastructure that provides services for the City includes:

Transportation Networks:

- Highway 99
- Highway 66
- Eagle Mill Rd
- Ashland St
- S Mountain Ave
- Interstate 5
- E Main St
- Tolman Creek Rd
- Walker Ave
- Oak St
- Hersey St
- Maple St
- Wildfire/Flood Evacuation Routes

Special Service Districts:

- Southern Oregon Education Service District

Water Facilities:

- 6 Pump Stations
- 57 Pressure Reducing Stations
- Water Treatment Plant
- 4 Water Reservoirs (above ground with 6.7 million gallons when full)
- 1,236 Fire Hydrants
- Reeder Reservoir
- Hosler Dam
- Wastewater Treatment Plant

Private Utilities:

- Avista Natural Gas
- 3 Electric Substations
- Communication Towers
- Recology Ashland

Hazard Characteristics

The following sections briefly describe relevant information for each profiled hazard. More information on Jackson County Hazards can be found in Volume 1, Section 2 *Risk Assessment* and in the Risk Assessment for Region 4, Southwest Oregon, Oregon SNHMP (2020).

Air Quality

The steering committee determined that the City's probability for poor air quality is **high** (which is the same as the County's Rating) and that their vulnerability to poor air quality is also **high** (which is the same as the County's Rating). *This hazard was not assessed in the previous version of this NHMP.*

Volume I, Section 2 describes the characteristics of air quality hazards, history, and how they relate to future climate projections, as well as the location, extent, and probability of a potential event. Increases in wildfire conditions have shown an increasing potential for air quality hazards.

The City of Ashland produced a Community Response Plan for Smoke that was adopted by the Jackson County Board of Commissioners in 2020. This plan provides information and planning for protecting smoke-vulnerable populations from wildfire and prescribed fire smoke. It also details methods for communication and notification about smoke and air quality to the community at large and groups that conduct prescribed burning from Ashland's public health authority. This plan is a living document that the city continues to update in partnership with the Ashland Forest Resiliency Stewardship Project. The Community Response plan can be found here.

Additional information on poor air quality can be found in Volume I, Section 2.

Drought

The steering committee determined that the City's probability for drought is **high** (which is the same as the County's rating) and that their vulnerability to drought is **high** (which is higher than the County's rating). *These ratings have not changed since the previous version of this NHMP.*

Volume I, Section 2 describes the characteristics of drought hazards, history, and how they relate to future climate projections, as well as the location, extent, and probability of a potential event. Due to the climate of Jackson County, past and present weather conditions have shown an increasing potential for drought.

Ashland draws its main water supply from Reeder Reservoir. Additionally, the Talent Ashland Phoenix (TAP) Intertie and the Talent Irrigation District (TID) are backup resources available for residential use during times of drought. For more information on the future of Ashland's water supply visit their website.

Please review Volume I, Section 2 for additional information on this hazard.

Earthquake (Cascadia)

The steering committee determined that the City's probability for a Cascadia Subduction Zone (CSZ) earthquake is **moderate** (which is the same as the County's rating) and that their vulnerability to a CSZ earthquake is **high** (which is the same as the County's rating). *The probability rating decreased, and the vulnerability rating stayed the same since the previous version of this NHMP.*

Volume I, Section 2 describes the characteristics of earthquake hazards, history, and the location, extent, and probability of a potential event. Generally, an event that affects the County is likely to affect Ashland as well. The causes and characteristics of an earthquake event are appropriately described within Volume I, Section 2 as well as the location and extent of potential hazards. Previous occurrences are well documented within Volume I, Section 2 and the community impacts described by the County would generally be the same for Ashland as well.

Figure AA-4 and Figure AA-5 display perceived shaking hazards from a Cascadia Subduction Zone earthquake event. The areas of greatest concern within the city are darker shades of orange.

The local faults, the county's proximity to the Cascadia Subduction Zone, potential slope instability, and the prevalence of certain soils subject to liquefaction and amplification combine to give the County a high-risk profile. Due to the expected pattern of damage resulting from a CSZ event, the Oregon Resilience Plan divides the State into four distinct zones and places Jackson County predominately within the "Valley Zone" (Valley Zone, from the summit of the Coast Range to the summit of the Cascades). Within the Southwest Oregon region, damage and shaking is expected to be strong and widespread - an event will be disruptive to daily life and commerce and the main priority is expected to be restoring services to business and residents.[14]

As noted in the community profile, approximately 66% of residential buildings were built prior to 1990, which increases the City's vulnerability to the earthquake hazard. Information on specific public buildings' (schools and public safety) estimated seismic resistance, determined by DOGAMI in 2007, is shown in Table AA-6; each "X" represents one building within that ranking category. Of the facilities evaluated by DOGAMI using their Rapid Visual Survey (RVS), one (1) has a very high (100% chance) collapse potential and six (6) have a high (greater than 10% chance) collapse potential.

[14] Ibid.

Table AA-6 Rapid Visual Survey Scores

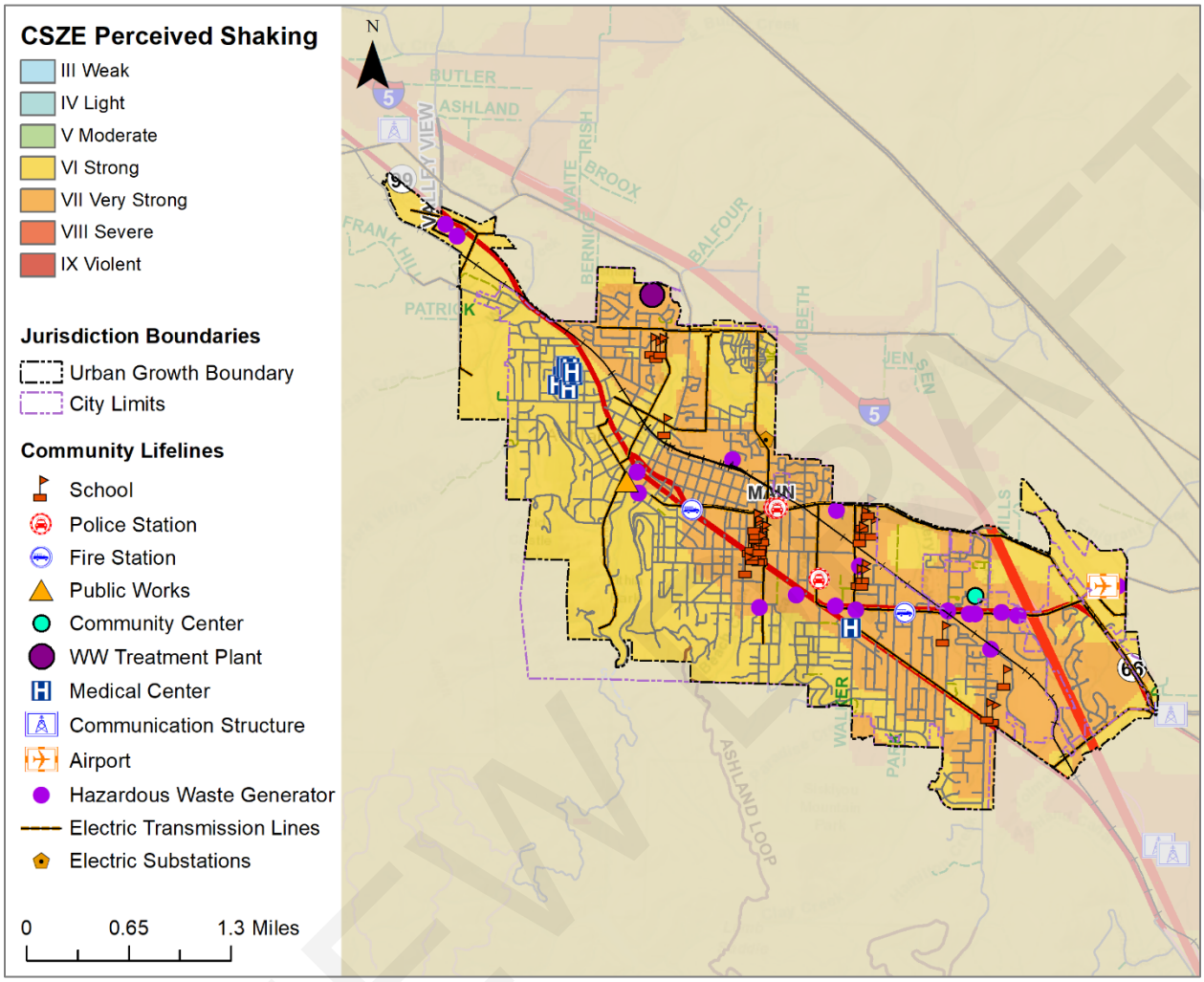
Facility	Site ID*	Level of Collapse Potential: Low (< 1%)	Moderate (>1%)	High (>10%)	Very High (100%)
Schools					
Ashland High School (Ashland SD 5) (201 S Mountain Ave) **- See Mitigation Successes**	Jack_sch07	X, X, X		X, X, X, X	X
Ashland Middle School (Ashland SD 5) (100 Walker Ave)	Jack_sch06	X			
Bellview Elementary School (Ashland SD 5) (1070 Tolman Creek Rd)	Jack_sch03			X	
Helman Elementary School (Ashland SD 5) (705 Helman St)	Jack_sch04	*2007 RVS report did not include structural appendix for this facility.*			
Walker Elementary School (Ashland SD 5) (364 Walker Ave) **- See Mitigation Successes**	Jack_sch05			X	
Public Safety					
Ashland Fire & Rescue (City of Ashland) (455 Siskiyou Blvd)	Jack_fir11	X			
Ashland Police Department (City of Ashland) (1155 E Main St)	Jack_pol08	X			
Hospital					
Ashland Community Hospital (NFP - Ashland) (280 Maple St)	Jack_hos01	X			
Southern Oregon University					
Various (see SOU NHMP)					

Source: DOGAMI 2007. Open File Report 0-07-02. Statewide Seismic Needs Assessment Using Rapid Visual Assessment. "*" – Site ID is referenced on the RVS Jackson County Map

In addition to building damages, utility (electric power, water, wastewater, natural gas) and transportation systems (bridges, pipelines) are also likely to experience significant damage. There is a low probability that a major earthquake will result in failure of upstream dams.

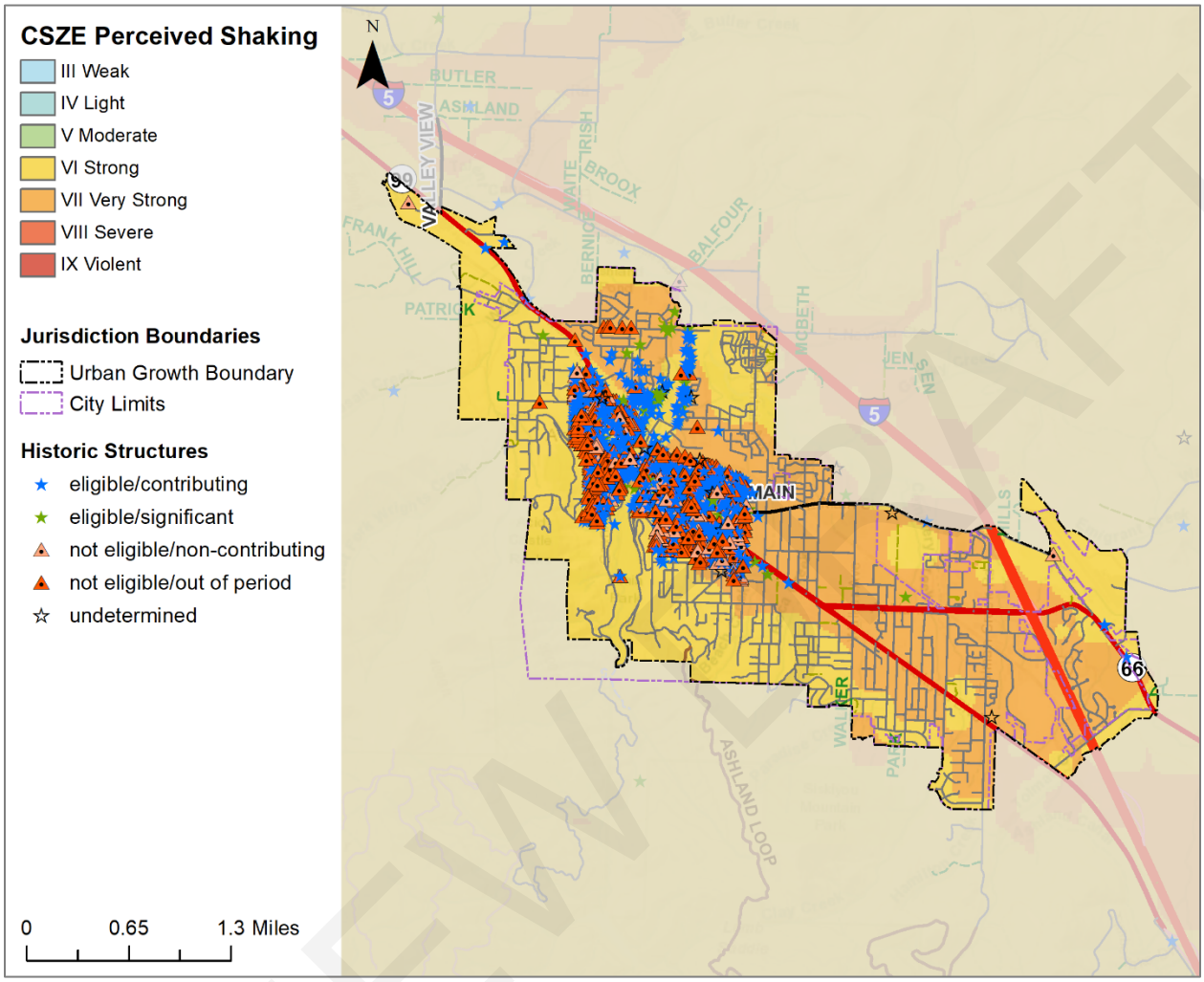
Utility systems will be significantly damaged, including damaged buildings and damage to utility infrastructure, including water treatment plants and equipment at high voltage substations (especially 230 kV or higher which are more vulnerable than lower voltage substations). Buried pipe systems will suffer extensive damage with approximately one break per mile in soft soil areas. There would be a much lower rate of pipe breaks in other areas. Restoration of utility services will require substantial mutual aid from utilities outside of the affected area.

Figure AA-4 Cascadia Subduction Zone Perceived Shaking and Community Lifelines



Source: Oregon Partnership for Disaster Resilience. Oregon Department of Geology and Mineral Industries.
Note: To view detail click this link to access Oregon HazVu.

Figure AA-5 Cascadia Subduction Zone Perceived Shaking and Historic Structures



Source: Oregon Partnership for Disaster Resilience. Oregon Department of Geology and Mineral Industries.
Note: To view detail click this link to access Oregon HazVu.

Earthquake (Crustal)

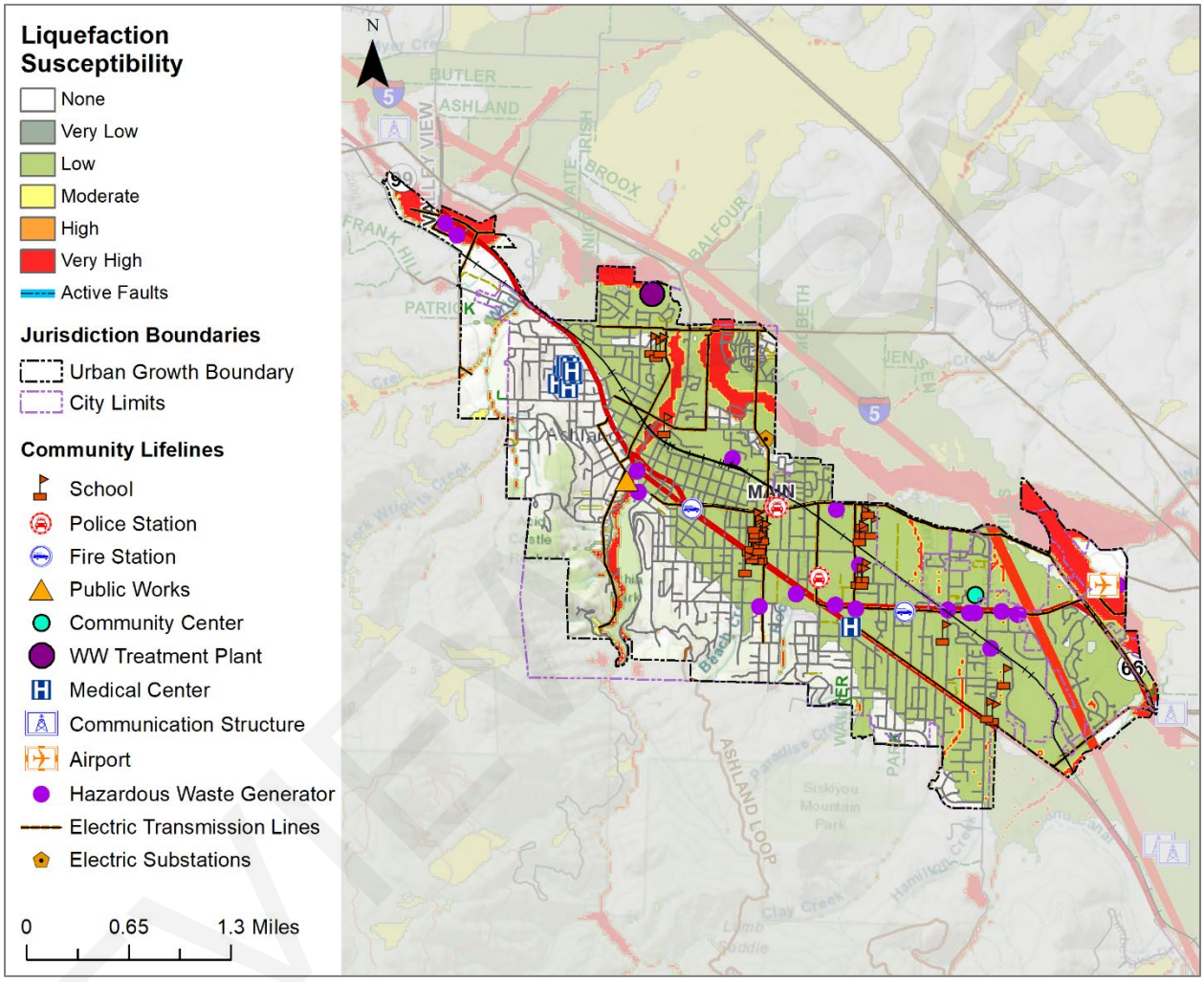
The steering committee determined that the City's probability for a crustal earthquake is **low** (which is the same as the County's rating) and that their vulnerability to crustal earthquake is **moderate** (which is higher than the County's rating). *These ratings have not changed since the previous version of this NHMP.*

Volume I, Section 2 describes the characteristics of earthquake hazards, history, as well as the location, extent, and probability of a potential event. Generally, an event that affects the County is likely to affect Ashland as well. The causes and characteristics of an earthquake event are appropriately described within Volume I, Section 2 as well as the location and extent of potential hazards. Previous occurrences are well-documented within Volume I, Section 2 and the community impacts described by the County would generally be the same for Ashland as well.

Earthquake-induced damages are difficult to predict and depend on the size, type, and location of the earthquake, as well as site-specific building and soil characteristics. Presently, it is not

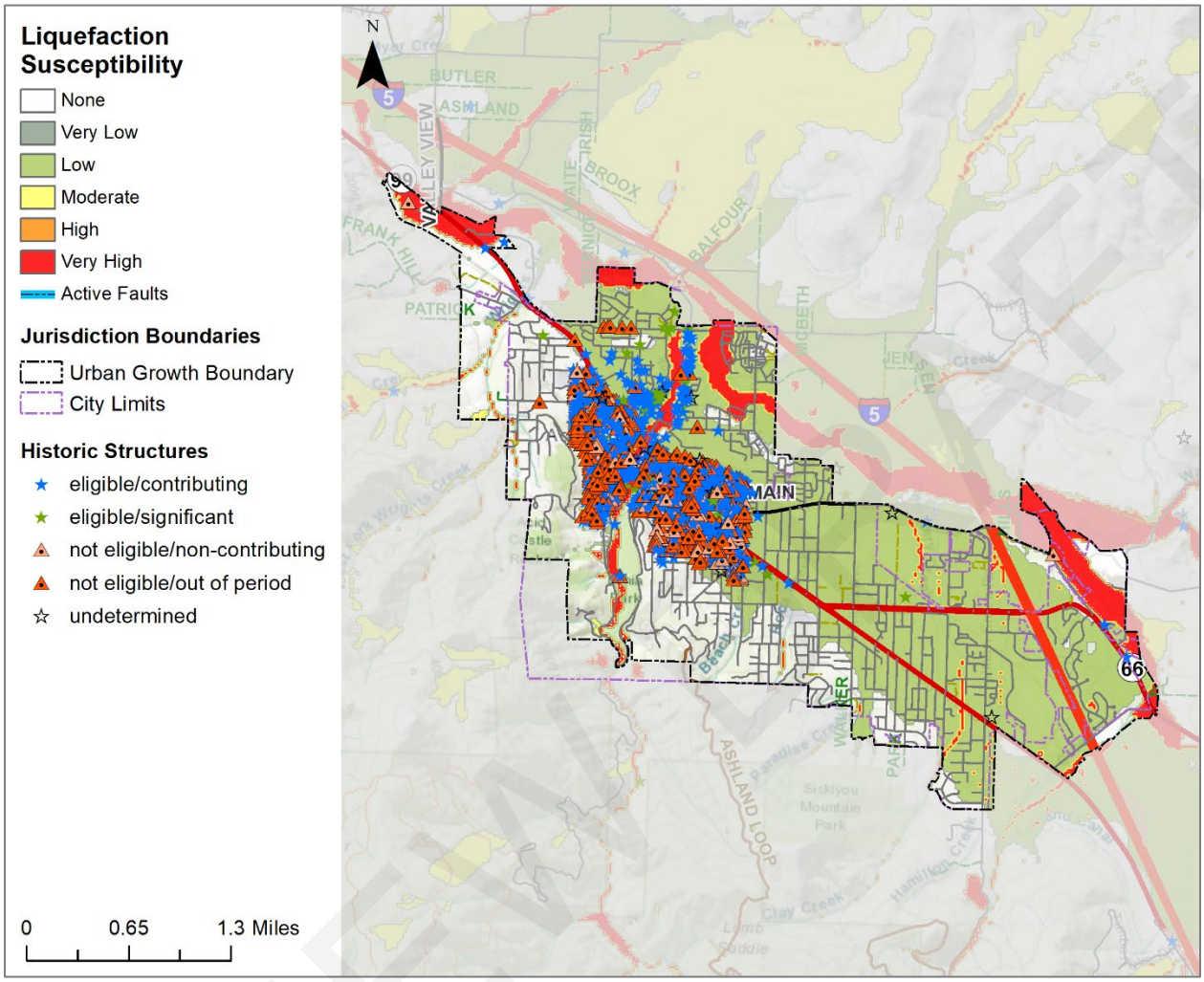
possible to accurately forecast the location or size of earthquakes, but it is possible to predict the behavior of soil at any site. In many major earthquakes, damages have primarily been caused by the behavior of the soil. Figure AA-6 and Figure AA-7 show the liquefaction risk to the community lifelines that are identified Table AA-5 in more detail in as well as the state historic building inventory buildings.

Figure AA-6 Liquefaction Susceptibility of Community Lifelines



Source: Oregon Partnership for Disaster Resilience. Oregon Department of Geology and Mineral Industries.
Note: To view detail click this link to access Oregon HazVu.

Figure AA-7 Liquefaction Susceptibility of Historic Buildings



Source: Oregon Partnership for Disaster Resilience. Oregon Department of Geology and Mineral Industries.
Note: To view detail click this link to access Oregon HazVu.

Vulnerability Assessment

Due to insufficient data and resources, Ashland is currently unable to perform a quantitative risk assessment, or exposure analysis, for this hazard. Identified Community Lifelines that are exposed to this hazard are shown in Table AA-5. Note that even if a facility has exposure*, it does not mean there is a high risk (vulnerability).* No development changes affected the jurisdiction's overall vulnerability to this hazard.

Emerging Infectious Disease

The steering committee determined that the City's probability for emerging infectious disease is **moderate** (which is the same as the County's rating) and that their vulnerability is **high** (which is the same as the County's rating). *These ratings have not changed since the previous version of this NHMP.*

Emerging infectious diseases are those that have recently appeared in a population or those whose incidence or geographic range is rapidly increasing or threatens to increase. Emerging infections may be caused by biological pathogens (e.g., virus, parasite, fungus, or bacterium) and may be: previously unknown or undetected biological pathogens, biological pathogens that have spread to new geographic areas or populations, previously known biological pathogens whose role in specific diseases was previously undetected, and biological pathogens whose incidence of disease was previously declining but whose incidence of disease has reappeared (re-emerging infectious disease).[15]

Volume I, Section 2 describes the characteristics of emerging infectious disease and local history, as well as the location, extent, and probability of a potential event within the region. Generally, an event that affects the County is likely to affect the City as well.

Low immunization rates within Jackson County, specifically in Ashland with the large foreign contingency that visits Ashland due to tourism and Southern Oregon University, contribute to the City's vulnerability.

Please review Volume I, Section 2 for additional information on this hazard.

Flood

The steering committee determined that the City's probability for flood is **high** (which is the same as the County's rating) and that their vulnerability to flood is **moderate** (which is the same as the County's rating). *These ratings have not changed since the previous version of this NHMP.*

Volume I, Section 2 describes the characteristics of flood hazards, history, and how they relate to future climate projections, as well as the location, extent, and probability of a potential event. Portions of Ashland have areas of mapped FEMA flood hazard zones, including areas along the Bear Creek, Clay Creek, and Ashland Creek (Figure AA-8 and Figure AA-9). Furthermore, other portions of Ashland, outside of the mapped floodplains, are also subject to flooding from local storm water drainage.

Ashland Creek is the chief source of flooding in Ashland. The creek, which has its origins in the Rogue River National Forest south of the City, is very steep and has a drainage area of approximately 27.5 square miles. The creek flows into Reeder Reservoir south of the City; from the reservoir, the creek flows northward and empties into Bear Creek. Clay Creek rises in the hills to the southeast of Ashland, flows northward at the eastern edge of the City and enters Bear Creek to the north.[16] Floods in the past, including the 1974 and 1997 floods on Ashland Creek, have caused failures with the Ashland water-supply system. Reeder Reservoir is created by Hosler Dam and is one of the City's chief concerns for flooding. The City maintains a Hosler Dam Emergency Action Plan and has an Early Warning System including cameras. A failure study

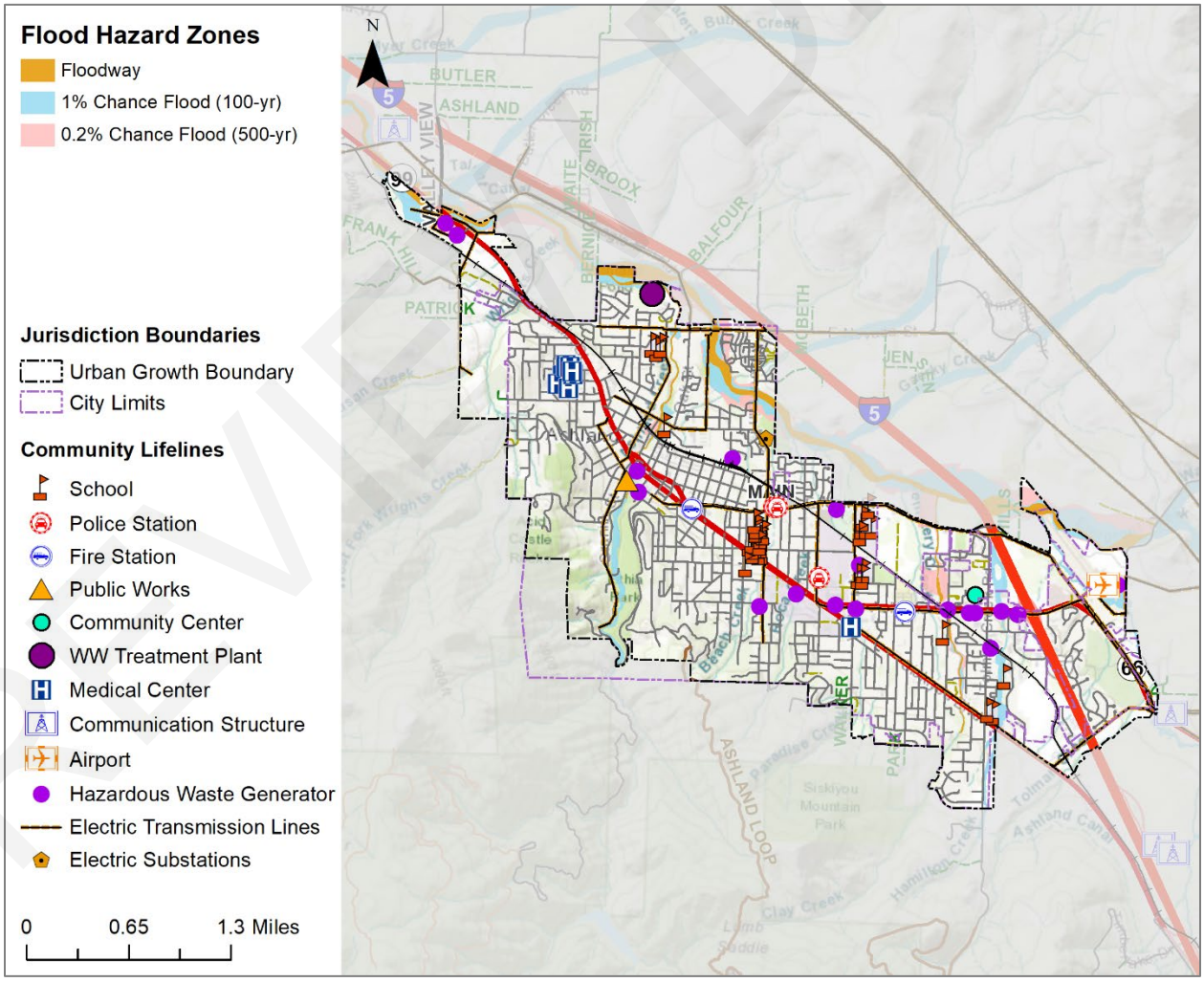
[15] Baylor College of Medicine, *Emerging Infectious Disease*, URL: https://www.bcm.edu/departments/molecular-virology-and-microbiology/emerging-infections-and-biodefense/emerging-infectious-diseases, accessed September 17, 2017.

[16] FEMA, Flood Insurance Study: Jackson County, Oregon and incorporated Areas, May 2011.

(inundation) map is also maintained on the City's website and shows the commercial and residential properties are at risk during a failure event.

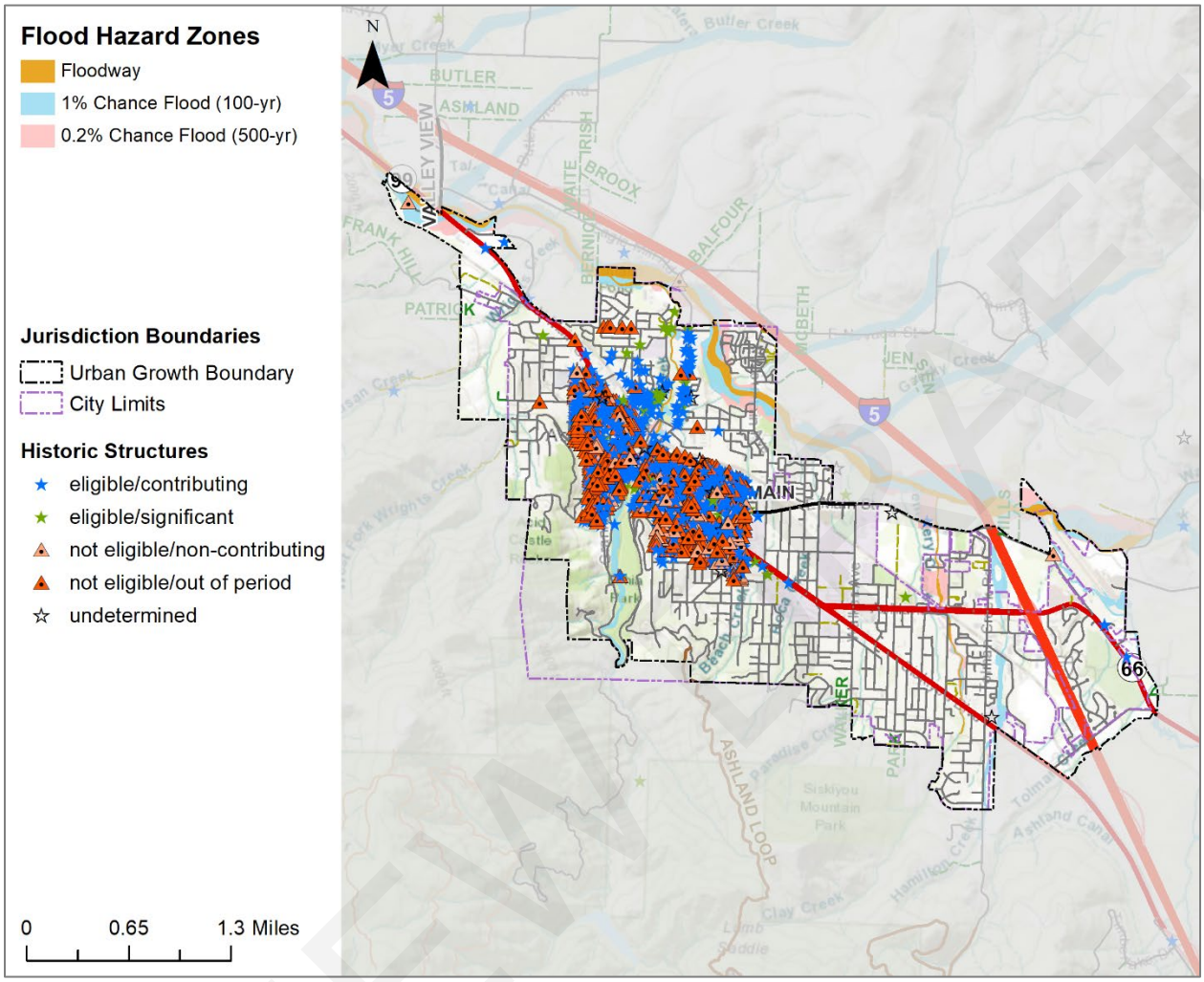
The City is at risk from two types of flooding: riverine and urban. Riverine flooding occurs when streams overflow their banks and inundate low-lying areas. This is a natural process that adds sediment and nutrients to fertile floodplain areas. It usually results from prolonged periods of precipitation over a wide geographic area. Most areas are generally flooded by low velocity sheets of water. Urban flooding occurs as land is converted to impervious surfaces and hydrologic systems are changed. Precipitation is collected and transmitted to streams at a much faster rate, causing floodwaters that rise rapidly and peak with violent force. During urban flooding, storm drains can back up and cause localized flooding of streets and basements. These flooding events and subsequent damages are commonly caused by the behavior of Ashland Creek and Bear Creek and their tributaries. Additional risks of flood are posed from Clay Creek, Hamilton Creek, Gaerky Creek, and Kitchen Creek. These urban creeks flow through many subsurface pipe systems that can be plugged by debris during flood events.

Figure AA-8 FEMA Flood Hazard Zones and Community Lifelines



Source: Oregon Partnership for Disaster Resilience. Oregon Department of Geology and Mineral Industries.
Note: To view detail click this link to access Oregon HazVu.

Figure AA-9 FEMA Flood Hazard Zones and Historic Buildings



Source: Oregon Partnership for Disaster Resilience. Oregon Department of Geology and Mineral Industries.
Note: To view detail click this link to access Oregon HazVu.

Vulnerability Assessment

Due to insufficient data and resources, Ashland is currently unable to perform a quantitative risk assessment, or exposure analysis, for this hazard. Identified community lifelines that are exposed to this hazard are shown in Table AA-5. Note that even if a facility has exposure, it does not mean there is a high risk (vulnerability). No development changes affected the jurisdiction's overall vulnerability to this hazard.

Floods can have a devastating impact on almost every aspect of the community, including private property damage, public infrastructure damage, and economic loss from business interruption. It is important for the City to be aware of flooding impacts and assess its level of risk. The City has been proactive in mitigating flood hazards by purchasing floodplain property.

The economic losses due to business closures often total more than the initial property losses that result from flood events. Business owners and their employees are significantly impacted by flood events. Direct damages from flooding are the most common impacts, but indirect

damages, such as diminished clientele, can be just as debilitating to a business. Following the January 1997 flood, businesses in Ashland suffered direct damage from high water and reduced water service resulting from damage to the public water system.

The FEMA Flood Insurance Study (January 19, 2018) has a brief history of flooding in Jackson County and Ashland (Volume I, Section 2). Following the 1997 floods, the City of Ashland was without a functional drinking water system for several weeks while repair and sanitization work was performed. Businesses that depended on the Ashland water supply were unable to operate and their employees were without work.

The City's central business district is located adjacent to Ashland Creek, which was a chief source of flood problems in the past. Both the 1974 and 1997 flood events caused significant damage to the City and water reservoir.[17] Currently, there is no financial impact data available of this infrastructure. It should be noted that major improvements in the culvert at Ashland Creek and Winburn Way will substantially decrease the likelihood of future flooding in the downtown business district.

Highway 99 and Interstate 5 are major transportation routes in the Rogue Valley. If major flooding affected all of the bridges in Ashland, traffic flow in and out of the City would be significantly affected, but would not cut all off all avenues. The amount of property in the flood plain is not a large area but damage could be significant as it would affect residential, commercial, and public property. Floodwaters can affect building foundations, seep into basements or cause damage to the interior, exterior and contents of buildings, dependent upon the velocity and depth of the water and by the presence of floating debris. The City sewer system can overflow during flood events and cause further property damage.

For mitigation planning purposes, it is important to recognize that flood risk for a community is not limited only to areas of mapped floodplains. Other portions of Ashland outside of the mapped floodplains may also be at relatively high risk from over bank flooding from streams too small to be mapped by FEMA or from local storm water drainage.

National Flood Insurance Program (NFIP)

FEMA updated the Flood Insurance Study (FIS) and Flood Insurance Rate Maps (FIRMs) in 2018 (effective January 19, 2018). Ashland's Class Rating within the Community Rating System (CRS) is a 9. The City complies with the NFIP through enforcement of their flood damage prevention ordinance and their floodplain management program.

The Community Repetitive Loss record for Ashland identifies zero (0) Repetitive Loss Properties[18] and zero (0) Severe Repetitive Loss Properties[19]. For details on the repetitive loss properties see Volume I, Section 2.

[17] Ibid.

[18] A Repetitive Loss (RL) property is any insurable building for which two or more claims of more than $1,000 were paid by the National Flood Insurance Program (NFIP) within any rolling ten-year period, since 1978. A RL property may or may not be currently insured by the NFIP.

[19] A Severe Repetitive Loss (SRL) property is a single family property (consisting of 1 to 4 residences) that is covered under flood insurance by the NFIP and has incurred flood-related damage for which 4 or more separate claims payments have been paid

Please review Volume I, Section 2 for additional information on this hazard.

Landslide

The steering committee determined that the City's probability for landslide is **high** (which is the same as the County's rating) and that their vulnerability to landslide is **moderate** (which is higher than the County's rating). *The probability rating stayed the same and the vulnerability rating decreased since the previous version of this NHMP.*

Volume I, Section 2 describes the characteristics of landslide hazards, history, and how they relate to future climate projections, as well as the location, extent, and probability of a potential event within the region. The potential for landslide in Ashland is high and the City's water treatment plant is vulnerable to landslide. The last major landslide event occurred in 1997 associated with the flooding rain events of that year.

Landslide susceptibility exposure for Ashland is shown in Figure AA-10 and Figure AA-11. Most of Ashland demonstrates a moderate to high susceptibility to landslide exposure, with corridors of moderate susceptibility concentrated around the outer edges of Highway 99 and Interstate-5. Approximately 18% of Ashland has very high or high and approximately 43% moderate landslide susceptibility exposure.[20]

Note that even if an area has a high percentage of land in a high or very high landslide exposure susceptibility zone, that does not mean there is a high risk (vulnerability), because risk is the intersection of a hazard and assets.

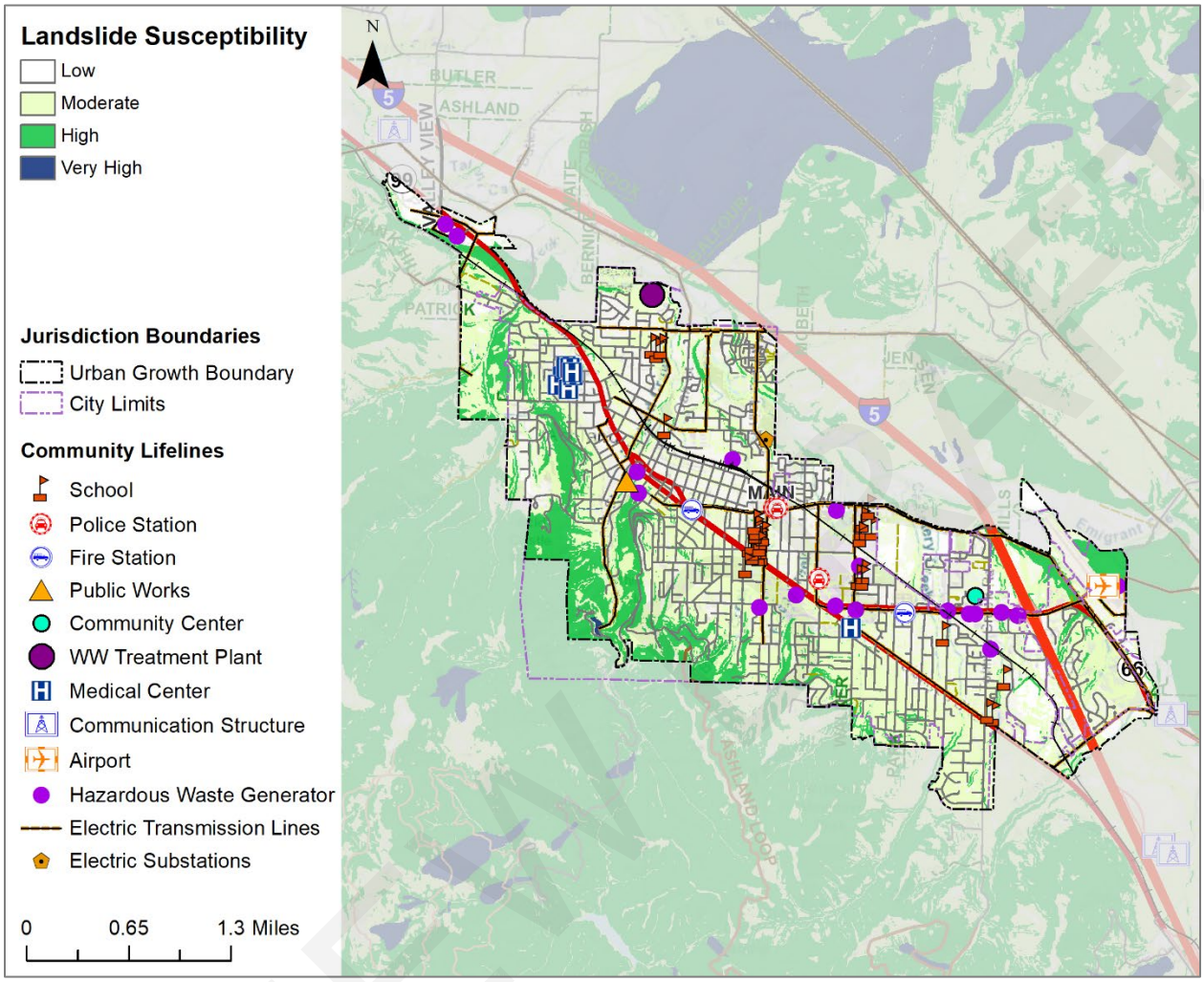
Potential landslide-related impacts are adequately described within Volume I, Section 2 and include infrastructural damages, economic impacts (due to isolation and/or arterial road closures), property damages, and obstruction to evacuation routes. Rain-induced landslides and debris flows can potentially occur during any winter in Jackson County and thoroughfares beyond City limits are susceptible to obstruction as well.

The most common type of landslides in Jackson County are slides caused by erosion. Slides move in contact with the underlying surface, are generally slow moving, and can be deep. Rainfall-initiated landslides tend to be smaller; while earthquake induced landslides may be quite large. All soil types can be affected by natural landslide triggering conditions.

under flood insurance coverage, with the amount of each claim payment exceeding $5,000 and with cumulative amount of such claims payments exceeding $20,000; or for which at least 2 separate claims payments have been made with the cumulative amount of such claims exceeding the reported value of the property.

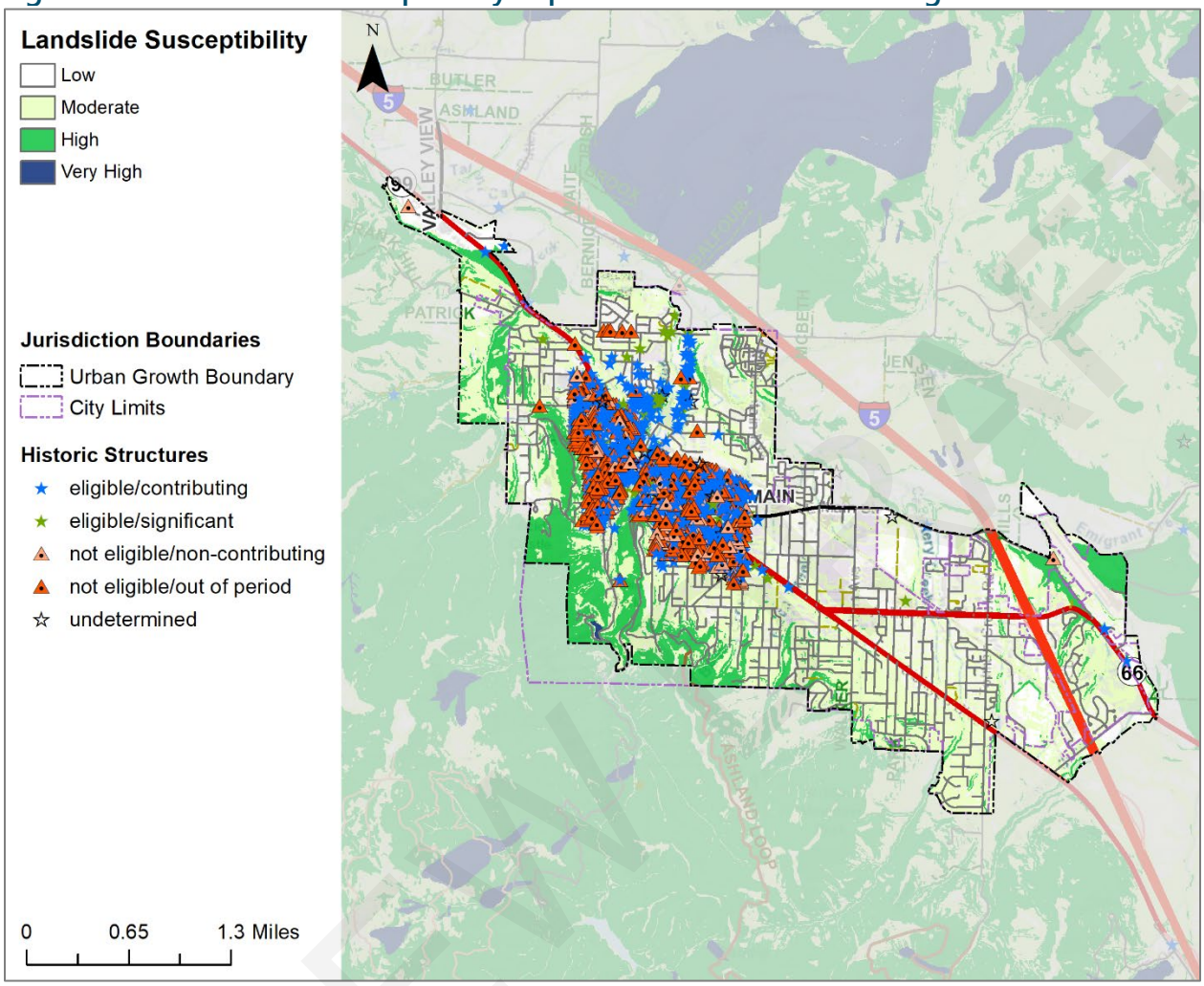
[20] DOGAMI Open-File Report, O-16-02, Landslide Susceptibility Overview Map of Oregon (2016)

Figure AA-10 Landslide Susceptibility Exposure and Community Lifelines



Source: Oregon Partnership for Disaster Resilience. Oregon Department of Geology and Mineral Industries.
Note: To view detail click this link to access Oregon HazVu.

Figure AA-11 Landslide Susceptibility Exposure and Historic Buildings



Source: Oregon Partnership for Disaster Resilience. Oregon Department of Geology and Mineral Industries.
Note: To view detail click this link to access Oregon HazVu.

Vulnerability Assessment

Due to insufficient data and resources, Ashland is currently unable to perform a quantitative risk assessment, or exposure analysis, for this hazard. Identified community lifelines that are exposed to this hazard are shown in Table AA-5.

Note that even if a facility has exposure, it does not mean there is a high risk (vulnerability). No development changes affected the jurisdiction's overall vulnerability to this hazard.

Please review Volume I, Section 2 for additional information on this hazard.

Severe Weather

Severe weather can account for a variety of intense and potentially damaging weather events. These events include extreme heat events, windstorms, and winter storms. The following section describes the unique probability and vulnerability of each identified weather hazard. Other more abrupt or irregular events such as hail are also described in this section.

Extreme Heat Event

The steering committee determined that the City's probability for an extreme heat event is **high** (which is the same as the County's Rating) and that their vulnerability to an extreme heat event is **moderate** (which is the same as the County's Rating). *This hazard was not assessed in the previous version of this NHMP.*

Jackson County's NHMP Volume I, Section 2 adequately describes the causes and characteristics of extreme heat, as well as the history, location, extent, and probability of a potential event and how it relates to future climate projections. Generally, an event that affects the County is likely to affect the City as well. A severe heat episode or "heat wave" occurs about every two to three years, and typically lasts two to three days but can last as many as five days. A severe heat episode can be defined as consecutive days of temperatures in the high 90s and above 100. Severe heat hazard in Southern Oregon can be described as the average number of days with temperatures greater than or equal to 90-degrees Fahrenheit.[21]

Extreme heat events can and have occurred in the city, and while they typically do not cause loss of life, they are becoming more frequent and have the potential to impact economic activity as well as quality of life and have caused threat to life in some cases.

See the Risk Assessment (Volume I, Section 2) for additional information on this hazard.

Windstorm

The steering committee determined that the City's probability for windstorms is **high** (which is the same as the County's rating) and that their vulnerability to windstorms is **high** (which is higher than the County's rating). *The probability rating stayed the same and the vulnerability rating increased since the previous version of this NHMP.*

Volume I, Section 2 describes the characteristics of windstorm hazards, history, and how they relate to future climate projections, as well as the location, extent, and probability of a potential event within the region. Because windstorms typically occur during winter months, they are sometimes accompanied by ice, freezing rain, flooding, and very rarely, snow. Other severe weather events that may accompany windstorms, including thunderstorms, hail, lightning strikes, and tornadoes are generally negligible for Ashland.

Volume I, Section 2 describes the impacts caused by windstorms, including power outages, downed trees, heavy precipitation, building damages, and storm-related debris. Additionally, transportation and economic disruptions result as well.

Damage from high winds generally has resulted in downed utility lines and trees usually limited to several localized areas. Electrical power can be out anywhere from a few hours to several days. Outdoor signs have also suffered damage. If the high winds are accompanied by rain (which they often are), blowing leaves and debris clog drainage-ways, which can lead to localized urban flooding.

[21] DLCD. *Oregon State Natural Hazard Mitigation Plan*. 2020.

Please review Volume I, Section 2 for additional information on this hazard.

Winter Storm (Snow/Ice)

The steering committee determined that the City's probability for winter storms is high (which is the same as the County's rating) and that their vulnerability to winter storms is high (which is higher than the County's rating). *The probability rating stayed the same and the vulnerability rating decreased since the previous version of this NHMP.*

Volume I, Section 2 describes the characteristics of winter storm hazards, history, and how they relate to future climate projections, as well as the location, extent, and probability of a potential event within the region. Severe winter storms can consist of rain, freezing rain, ice, snow, cold temperatures, and wind. They originate from troughs of low pressure offshore that ride along the jet stream during fall, winter, and early spring months. Severe winter storms affecting the City typically originate in the Gulf of Alaska or in the central Pacific Ocean. These storms are most common from November through March.

Major winter storms can and have occurred in the Ashland area, and while they typically do not cause significant damage, they are frequent and have the potential to impact economic activity. Road and rail closures due to winter weather are an uncommon occurrence but can interrupt commuter and commercial traffic.

Please review Volume I, Section 2 for additional information on this hazard.

Volcanic Event

The steering committee determined that the City's probability for a volcanic event is low (which is the same as the County's rating) and that their vulnerability to a volcanic event is low (which is the same as the County's rating). *These ratings did not change since the previous version of this NHMP.*

Volume I, Section 2 describes the characteristics of volcanic hazards, and their local history, as well as the location, extent, and probability of a potential event within the region. Generally, an event that affects the County is likely to affect Ashland as well. Ashland is very unlikely to experience anything more than volcanic ash during a volcanic event. Ashland's water supply has a high concentration of sulfur which could increase during a volcanic event.

Please review Volume I, Section 2 for additional information on this hazard.

Wildfire

The steering committee determined that the City's probability for wildfire is **high** (which is the same as the County's rating) and that their vulnerability to wildfire is **high** (which is higher than the County's rating). *These ratings have not changed since the previous version of this NHMP.*

Volume I, Section 2 describes the characteristics of wildland fire hazards, history, and how they relate to future climate projections, as well as the location, extent, and probability of a potential event within the region. The location and extent of a wildland fire vary depending on fuel, topography, and weather conditions. Weather and urbanization conditions are primarily at cause for the hazard level. Notable wildland fires have occurred in Ashland and it remains a concern due to an increased amount of development along the Wildland-Urban Interface. In addition, the City's watershed is particularly vulnerable and a wildfire in that area would impact its water supply and potentially lead to landslides and increased flooding concerns.

Please review Page 17 of the 2016 Ashland Forest Plan for more fire related details.

Ashland, along with Talent, Phoenix, and Medford Ashland, was severely affected by the Almeda Fire in September 2020. Due to initial firefighting efforts less than one dozen structures were damaged by fire within the city limits.

The potential community impacts and vulnerabilities described in Volume I, Section 2 are generally accurate for the City as well. Ashland developed a Community Wildfire Protection Plan in 2004. The Rogue Valley Integrated Fire Plan (RVIFP, updated 2019) assesses wildfire risk, maps wildland urban interface areas, and includes actions to mitigate wildfire risk. The City is included in the RVIFP and will update the City's wildfire risk assessment if the fire plan presents better data during future updates (an action item is included within Volume I, Section 4 to participate in updates to the integrated fire plan and to continue to maintain and update their RVIFP). Ashland is within an area of high wildfire prone urban landscape. The City hereby incorporates the RVIFP into this addendum by reference to provide greater detail to sensitivity and exposure to the wildfire hazard.

Property can be damaged or destroyed with fire as structures, vegetation, and other flammables easily merge to become unpredictable and hard to manage. Other factors that affect the ability to effectively respond to a wildfire include access to the location and to water, response time from the fire station, availability of personnel and equipment, and weather (e.g., heat, low humidity, high winds, and drought).

The City is involved in an ongoing project known as the Ashland Forest Resiliency (AFR) Stewardship Project. AFR is a collaboration between the City, the Nature Conservancy, the U.S. Forest Service, and Lomakatsi Restoration Project, which is working to enhance and protect over 58,000 acres of landscape from Emigrant Lake to Wagner Creek irrespective of ownership.

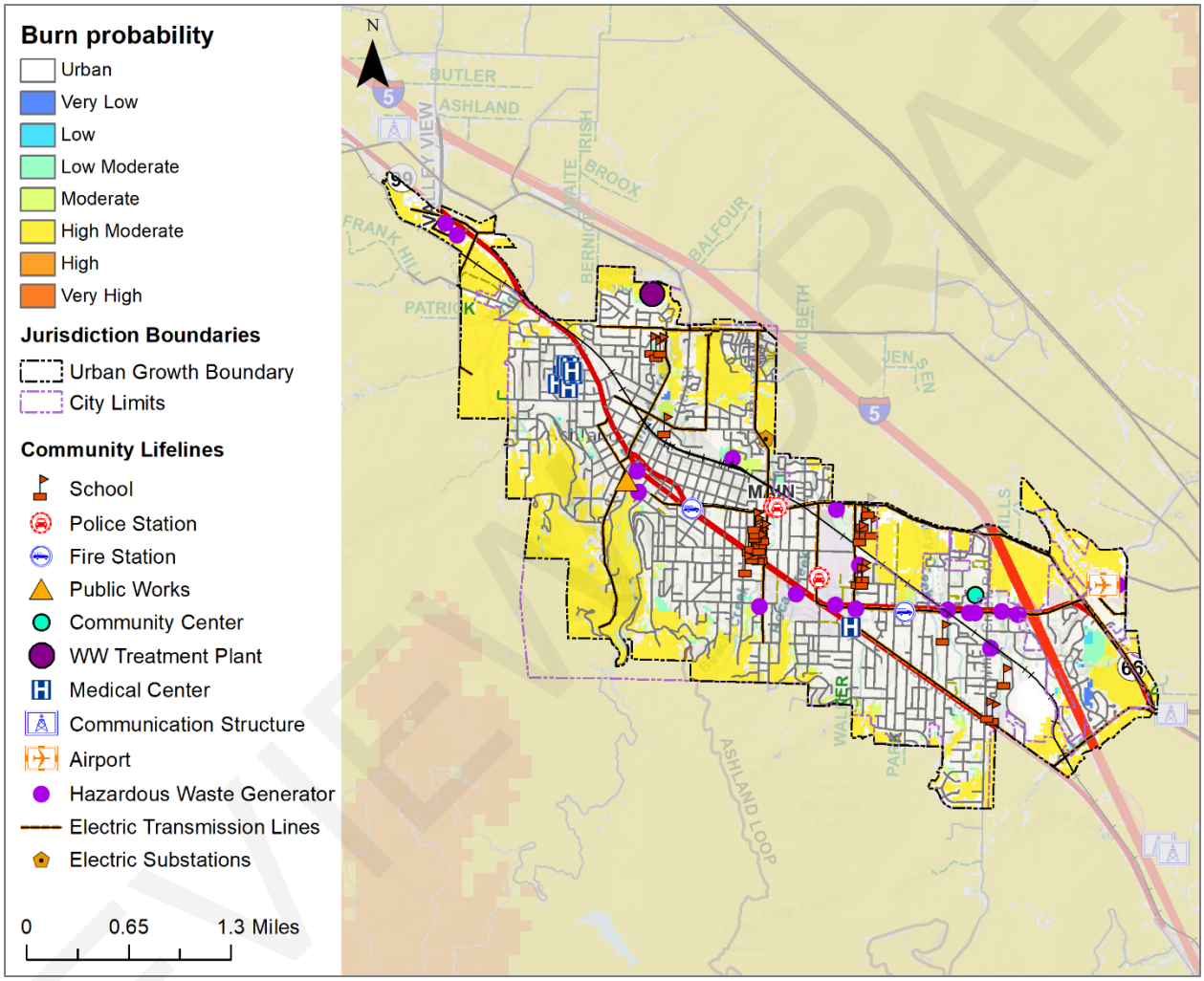
Ashland also participates in Firewise and has a Wildfire Hazard Zone Overlay that dates back to 1992 that, as of 2018, includes all structures within city limits. The City is also considering adopting a wildfire ordinance that would address:

- Fire prone vegetation within 3 ft of a structure

- 10 ft spacing from tree branches to a chimney
- Spacing requirements for existing fire prone trees and shrubs
- Additional fuel break size for lots with more than 20% slope

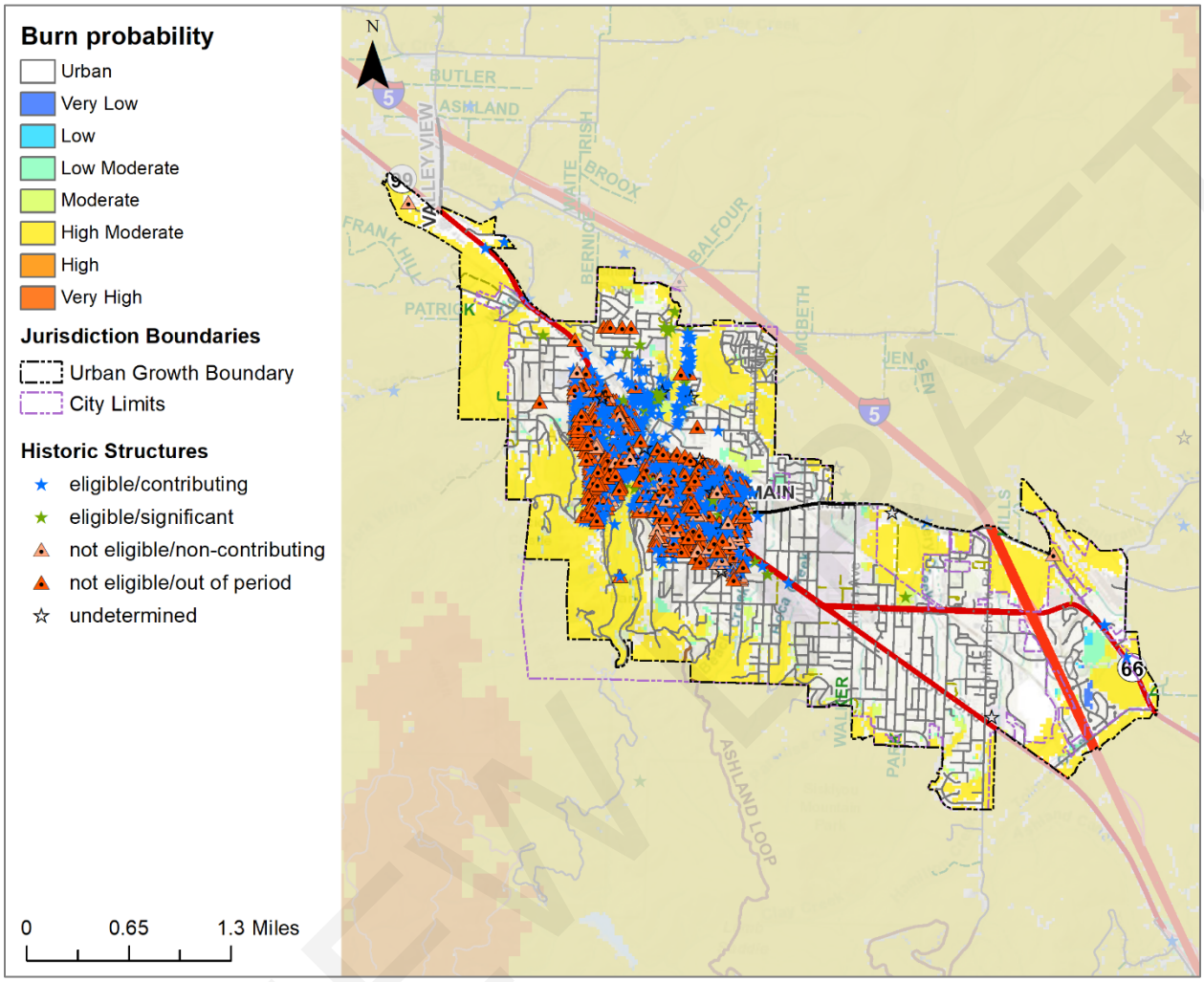
Figure AA-12 and Figure AA-13 show burn probability in Ashland for community lifelines and historic buildings.

Figure AA-12 Burn Probability in Ashland and Community Lifelines



Source: Oregon Partnership for Disaster Resilience. USFS Pacific Northwest Region Wildfire Risk Assessment (PNRA)
Note: To view detail click this link to access Oregon Explorer's CWPP Planning Tool. Note: All structures within the city are in the Wildfire Hazard Zone (link).

Figure AA-13 Burn Probability in Ashland and Historic Buildings



Source: Oregon Partnership for Disaster Resilience. USFS Pacific Northwest Region Wildfire Risk Assessment (PNRA)
Note: To view detail click this link to access Oregon Explorer's CWPP Planning Tool. Note: All structures within the city are in the Wildfire Hazard Zone (link).

Vulnerability Assessment

Due to insufficient data and resources, Ashland is currently unable to perform a quantitative risk assessment, or exposure analysis, for this hazard. Identified community lifelines that are exposed to this hazard are shown in Table AA-5. Additionally, all structures in the city are considered exposed to wildfire, directly or indirectly, and are within the Wildfire Hazard Zone. Structures within the city have to comply with the requirements of the zone (link).

Note that even if a facility has exposure, it does not mean there is a high risk (vulnerability). No development changes affected the jurisdiction's overall vulnerability to this hazard.

Please review Volume I, Section 2 for additional information on this hazard.

Attachment A: Public Involvement Summary

Members of the steering committee provided edits and updates to the NHMP prior to the public review period as reflected in the final document. In addition, a survey was distributed that included responses from residents of Ashland (Volume III, Appendix F).

To provide the public information regarding the draft NHMP addendum, and provide an opportunity for comment, an announcement (see below) was provided from September XX through September XX on the City's website. There were XX [to be updated following public comment period] comments provided. Additional opportunities for stakeholders and the public to be involved in the planning process are addressed in Volume III, Appendix B.

Website Posting

Posting to be inserted

Ashland Steering Committee

Steering committee members possessed familiarity with the community of Ashland and how it is affected by natural hazard events. The steering committee guided the update process through several steps including goal confirmation and prioritization, action item review and development, and information sharing, to update the NHMP and to make the NHMP as comprehensive as possible. The steering committee met formally on the following date:

Meeting #1: Ashland steering committee, February 14, 2023 (via Zoom)
During this meeting, the steering committee reviewed the previous NHMP, and were provided updates on hazard mitigation planning, the NHMP update process, and project timeline. The steering committee:

- Updated recent history of hazard events in the city.
- Reviewed and confirmed the County NHMP's mission and goals.
- Discussed the NHMP public outreach strategy.
- Reviewed and provided feedback on the draft risk assessment update including community vulnerabilities and hazard information.
- Reviewed and updated their existing mitigation strategy (actions).
- Reviewed and updated their implementation and maintenance program.

Meeting Attendees:

- Kelly Burns, Emergency Management Coordinator
- Chris Chambers, Ashland Fire Department

Attachment B: Action Item Changes

Volume I, Section 3 provides a summary list of actions for the County. Below is an accounting of the major changes to actions since the previous NHMP.

Renumbered 2017 Actions:

2017 Action Item	2022 Action Item
Multi-Hazard #1	Multi-Hazard 1.1
Multi-Hazard #2	Multi-Hazard 1.2
Multi-Hazard #3	Multi-Hazard 1.3
Earthquake #1	Earthquake 4.1
Earthquake #2	Earthquake 4.2
Earthquake #3	Earthquake 4.3
Earthquake #4	Earthquake 4.4
Flood #1	Flood 6.2
Flood #2	Flood 6.3
Landslide #1	Landslide 7.1
Wildfire #1	Wildfire 10.1
Wildfire #2	Wildfire 10.2
Wildfire #3	Wildfire 10.3

Previous NHMP Actions Completed:

- (2017) WF #4 Wildfire Mitigation Ordinance adopted/complete.

New NHMP Actions:

The following actions were added to the 2023 NHMP:

- Flood 6.1
- Wildfire 10.4