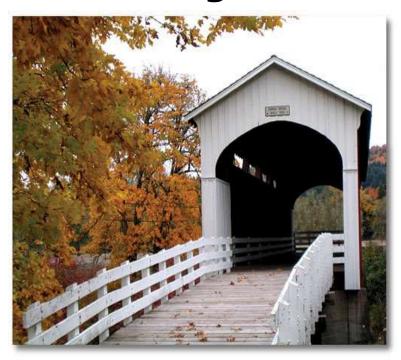
# Lane County Multi-Jurisdiction Hazard Mitigation Plan







Version 5.0

(September 2018 – September 2023)
LANE COUNTY, CITY OF COBURG, CITY OF CRESWELL, DUNES
CITY, CITY OF FLORENCE, CITY OF OAKRIDGE,
CITY OF VENETA, CITY OF WESTFIR

Developed by the Lane County Hazard Mitigation & Emergency Management Steering Committee, in accordance with PUBLIC LAW 93–288 (Robert T. Stafford Disaster Relief and Emergency Assistance Act), as amended, 42 U.S.C. 5121-5207; PUBLIC LAW 106–390 (Disaster Mitigation Act of 2000); et al.

### **ANNEX 5 - CITY OF OAKRIDGE**



Version 5.0 (March 2018)

#### **Introduction: City of Oakridge**

This purpose of this annex to the Lane County Multi-Jurisdiction Hazard Mitigation Plan is to consolidate information specific to the City of Oakridge and serve as an executive summary. 44 CFR 201 requirements are addressed in the main document, this annex provides supplemental information. For more information regarding Code of Federal regulations for Local Hazard Mitigation Planning see overview in Chapter 1 and citations and abstracts for Chapters 2, 3, 4, 5 of the main document.

The 2017 Lane County Multi-Jurisdiction Hazard Mitigation Plan sanctioned by OEM and FEMA is the first for which the City of Oakridge has been a formal participant. Like other formal participants (Lane County, Coburg, Creswell, Veneta, Dunes City, Florence, and Westfir), being a participant in an approved multi-jurisdiction hazard mitigation plan creates eligibility for the following important federal grants:

- Hazard Mitigation Grant Program (HMGP)
- Pre-Disaster Mitigation Grants (PDM)
- Flood Mitigation Assistance Grants (FMA)

In addition to creating eligibility for federal grants, this document serves as 5-year road map for activities with the purpose and potential to make Oakridge a stronger, safer, and more resilient community.

Sub-sections of this annex to the Lane County Multi-Jurisdiction Hazard Mitigation Plan describe the following:

- Individual participants and contributors, meetings and work sessions conducted during the plan development process.
- Results of the OEM prescribed hazard quantification process for each hazard type and discussion of previous occurrences, probability of future occurrence, potential vulnerability of public and private assets, and maximum credible threat posed by each hazard.
- Details regarding mitigation projects identified as priorities, including location, photos, estimated cost, grant funding options, implementation timeframe, and hazards addressed.
- Details for mitigation project implementation, review of local program, and plan update 5-year cycle.

#### City of Oakridge: Hazard Mitigation Meetings and Work Sessions

Development of City of Veneta material for the hazard mitigation plan involved participation by city, county, fire district, law enforcement, and project assistants. The process followed FEMA's prescribed model for organizing resources, identifying hazards, evaluating risk, identifying mitigation options, prioritizing mitigation projects. For additional details regarding the planning process, refer to Chapter 2 (Planning Process), main document.

Specific participants are listed as follows:

#### City of Oakridge Hazard Mitigation Team

Name	Title	Agency
Louis Gomez	City of Oakridge	Oakridge City Manager
Albert Alvade	Oakridge Fire Department	Oakridge Fire Chief
Chuck Kurmick	Oakridge Public Works	Public Works Director
Susan LaDuke	Finance Director/City Recorder	City of Oakridge
Kevin Martin	Oakridge Police Department	Chief of Police
Linda Cook	Lane County Sheriff's Office	Lane County Emergency Manager
Greg J. Wobbe, CFM	Principal	OCR West, MPTX Associates

#### **Individual City Work Sessions**

Work sessions with individual cities were conducted following the initial project orientation meeting and intervening months between general planning group meetings. These individual work sessions are outlined below.

#### City of Oakridge Work Sessions

Date	Location	Meeting/Work Session
June 29, 2015	Oakridge City Hall	Project overview, basic data collection
July 27, 2015	Oakridge City Hall	Risk assessment, Hazard quantification
October 23, 2015	Oakridge City Hall	Hazard quantification-seismic assessment review, SRGP, FEMA mitigation grant programs, mitigation ideas
June 28, 2016	Oakridge project tour	Mitigation project site tour

#### **City of Oakridge: Hazard Quantification**

An interesting element of the hazard mitigation process is risk assessment. Risk assessment begins by identifying the full range of potential hazards which may occur in the community. Once identified, these potential hazards are evaluated to determine relative importance and aids prioritization of mitigation activities.

There are various means for evaluating hazards and the risk they present. "Hazard Quantification" is a scoring method prescribed by the State of Oregon Office of Emergency Management (OEM) is used to assist with prioritizing hazards and understanding risk. It doesn't predict the occurrence of a particular hazard, but it does "quantify" the risk of one hazard compared with another. By doing this analysis, planning can first be focused where the risk is greatest. Among other things, this hazard analysis can:

- help establish priorities for planning, capability development, and hazard mitigation;
- serve as a tool in the identification of hazard mitigation measures;
- be one tool in conducting a hazard-based needs analysis;
- serve to educate the public and public officials about hazards and vulnerabilities;
- help communities make objective judgments about acceptable risk.

One of the many strengths of the hazard quantification approach is it employs a consistent methodology with the intent of objective results and findings. The methodology was first developed by the Federal Emergency Management Agency (FEMA) circa 1983, and gradually refined by Oregon Emergency Management (OEM) over the years. The methodology produces scores that range from 24 (lowest possible) to 240 (highest possible). By applying one order of magnitude from lowest to highest, a hazard with a score of 240 is considered ten times more severe than a hazard with a rating of 24.

Maximum threat, vulnerability, and probability assessment are key components of the methodology. Maximum threat considers degree of impact under a worst case scenario, regardless of probability. Vulnerability examines potential impacts to populations, the built environment, and natural environment for 'typical' events.

Probability reviews frequency of past events as a means of predicting likelihood of future occurrence. Somewhat less vital to overall hazard quantification score (but still relevant) is history of occurrence. The four OEM prescribed hazard quantification categories are listed and described below.

#### **Hazard Quantification Categories**

- 1) <u>History</u> (previous occurrences, primarily within last century)
- 2) Probability (calculated likelihood of future occurrence)
- 3) Vulnerability (number, degree or extent of people or assets at risk per hazard)
- 4) Maximum threat (credible worst-case scenario)

#### **Weight Factors**

Weighting factors were developed for each of the four hazard quantification categories. This is done to emphasize certain categories over others in terms of risk assessment.

- 1) History (weight factor x 2)
- 2) Probability (weight factor x 7)

- 3) Vulnerability (weight factor x 5)
- 4) Maximum threat (weight factor x 10)

#### **Scoring Guidelines**

Scoring guidelines were developed by OEM as a method of standardizing assessment and to minimize subjectivity.

<u>History</u> (weight factor for category = 2). History is the record of previous occurrences. Events to include in assessing history of a hazard event for which the following types of activities were required:

- The EOC or alternate EOC was activated;
- Three or more EOP functions were implemented, e.g., alert & warning, evacuation, shelter, etc.
- An extraordinary multi-jurisdictional response was required; and/or
- A "Local Emergency" was declared.

LOW – score at 1 to 3 points based on... 0 - 1 event past 100 years MEDIUM – score at 4 to 7 points based on... 2 - 3 events past 100 years HIGH – score at 8 to 10 points based on... 4 + events past100 years

#### **Probability** (weight factor for category = 7)

Probability is the likelihood of future occurrence within a specified period of time.

LOW – score at 1 to 3 points based on... one incident likely within 75 to 100 years

MEDIUM – score at 4 to 7 points based on... one incident likely within 35 to 75 years

HIGH – score at 8 to 10 points based on... one incident likely within 10 to 35 years

#### **Vulnerability** (weight factor for category = 5)

Vulnerability is the percentage of population and property likely to be affected under an "average" occurrence of the hazard.

LOW – score at 1 to 3 points based on... < 1% affected

MEDIUM – score at 4 to 7 points based on... 1 - 10% affected

HIGH – score at 8 to 10 points based on... > 10% affected

#### **Maximum Threat** (weight factor for category = 10)

Maximum threat is the highest percentage of population and property that could be impacted under a worst-case scenario.

LOW – score at 1 to 3 points based on... < 5% affected

MEDIUM – score at 4 to 7 points based on... 5 - 25% affected

To tabulate, scores for each category are multiplied by the associated weight factors to create a 'sub-score'. Adding the sub-scores for history, vulnerability, maximum threat, and probability for each hazard produces a 'total hazard quantification score' for each hazard.

The following table summarizes hazard quantification results, followed by a detailed discussion for each hazard.

#### City of Oakridge: Hazard Quantification Results

Hazard Type / Weight Factor (WF)	History WF x 2	Probability WF x 7	Vulnerability WF x 5	Maximum Threat WF x 10	Raw Score	Weighted Score	Weighted Score Rank
Winter Storm	10	10	10	10	40	240	1
Flood	8	8	10	10	36	222	2
Windstorm	8	8	10	10	36	222	3
Haz Mat Incident	10	10	6	10	36	220	4
Wildfire	10	10	5	10	35	215	5
Drought	4	8	6	8	26	174	6
Volcano	2	2	5	10	19	143	7
Earthquake	2	3	2	10	17	135	8
Dam Failure	0	1	6	8	15	117	9
Landslide	1	2	4	7	14	106	10
Pandemic	2	2	4	4	12	78	11
Tsunami	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Source: City of Oakridge Hazard Mitigation Team

#### Individual Hazard Discussion, City of Oakridge

#### Winter Storm

Hazard (Category)	Raw Score	Weighted Score
Winter Storm (Overall)	40	240
Winter Storm (History)	10	20
Winter Storm (Probability)	10	70
Winter Storm (Vulnerability)	10	50
Winter Storm (Maximum Threat)	10	100

#### Winter Storm notes:

Oakridge, like most cities in Oregon faces a regular occurrence of winter storms, which occur at least once in most years. In Oakridge, winter conditions including significant snowfall are regular occurrences due to the city's elevation. The city contains a network of above ground electrical lines vulnerable to damage from falling limbs and trees during winter storms. Recent history has seen storms causing some damage and power loss in 2014, 2015 and 2016. Wind is nearly always a contributing factor these winter storms. Probability is considered high that patterns of previous occurrence will continue. The percentage of population potentially affected by winter storm is high since effects are not geographically contained, and the city itself is situated on the western side of the Cascade Mountains where weather can intensify due to the forced uplift of air caused by the mountains surrounding the city. The result is a high vulnerability. Transportation and roadways are also vulnerable to closure during winter storms, though the city benefits from primarily level terrain with exception of western outskirts. Maximum threat is more moderate however due to somewhat limited threat of structural damage directly related to winter weather (cold, snow, ice). See also winter storm hazard profile in Section 3 of the main document.

#### Flood

Hazard (Category)	Raw Score	Weighted Score
Flood (Overall)	36	222
Flood (History)	8	16
Flood (Probability)	8	56
Flood (Vulnerability)	10	50
Flood (Maximum Threat)	10	100

#### Flood notes:

Flood is a geographically contained hazard, which in the valley that is home to Oakridge, is one with real potential for occurrence. The Oakridge area is a sloped valley in the foothills of the Cascade Range surrounded by the Willamette National Forest. Five streams pass through this relatively small area between mountain ridges: Salmon Creek, Salt Creek, Hills Creek, and the Middle and North forks of the Willamette River. These five tributaries join to create the Middle fork of the Willamette River, which flows North West into Lookout Point Lake, a U.S. Corps of Engineers Willamette Valley Project Dam. Oakridge is within 5 miles of the Hills Creek Dam to the south east, another U.S. Army Corps of Engineer's project, controlling seasonal flooding in the larger Willamette Valley.

The history of flooding in Oakridge is high as the geography the city is built upon is created from repeated floods in the past over great lengths of time. It is a significant egress for melting winter snows out of the surrounding mountainside. The future probability for flooding is relatively high. Overall vulnerability and maximum threat scores are very high, widespread severe damage from flooding is likely in the future. See also flood hazard profile in section 3 of the main document.

**National Flood Insurance Program (Program)** The City of Oakridge is a formal program participant in good standing and considers continued participation as integral to future flood mitigation efforts. Participation consists of adoption and maintenance of Flood Insurance

Rate Maps (FIRMs) which define Special Flood Hazard Areas (SFHAs) and maintenance of an ordinance regulating future development in SFHAs. The Flood Insurance Rate Map Community Number for Creswell is 410121. Compliance with the program is pursuant to the City of Oakridge's floodplain ordinance.

Statistics as reported by FEMA on the NFIP Bureau Net for the period of January 1, 1978 through January 31, 2018 are as follows:

#### NFIP Policies in Force

Policies in Force: 12 Insurance in Force: \$ 2,509,900 Premium in Force: \$ 10,045

#### Insurance Claim Data

There are no reported claims.

#### **Data Definitions**

Policies In Force – Policies in force on the "as of" date of the report.

Insurance In Force – The coverage amount for policies in force.

Written Premium In Force – The premium paid for policies in force.

#### Windstorm

Hazard (Category)	Raw Score	Weighted Score
Windstorm (Overall)	36	222
Windstorm (History)	8	16
Windstorm (Probability)	8	56
Windstorm (Vulnerability)	10	50
Windstorm (Maximum Threat)	10	100

#### Windstorm notes:

Similar to winter storm, windstorm can and frequently does impact above ground electrical lines vulnerable to damage from falling limbs and trees. Recent history- includes damages caused by storms in a nearly yearly basis. Probability is similarly considered high that patterns of previous occurrence will continue. Overall vulnerability is very high, with roadways notably vulnerable to closure due to downed trees, and loss of power due to damage to powerlines which in some cases traverse difficult to access terrain. The Columbus Day storm of 1962 can serve as an example for maximum threat, reports at the time noted 40 trees downed over Hwy 58, in just a single mile of roadway, trapping 19 vehicles. A windstorm of similar magnitude to the Columbus Day Storm could potentially damage numerous of homes in city, either by direct structural damage, falling trees, or wind-

blown debris. Due to its location in the Cascade Mountain foothills, the city experiences significant winds as compared to other communities in Oregon. The access routes the city is dependent upon, both by road and rail, are more exposed. See also windstorm hazard profile in section 3 of the main document.

#### **Hazardous Materials Incident**

Hazard (Category)	Raw Score	Weighted Score
Haz Mat Incident (Overall)	36	220
Haz Mat Incident (History)	10	20
Haz Mat Incident (Probability)	10	70
Haz Mat Incident (Vulnerability)	6	30
Haz Mat Incident (Maximum Threat)	10	100

#### Hazardous Materials Incident notes:

Hazardous materials incident is considered a technical hazard and involves different characteristics than natural hazards. Oakridge is historically a railroad town, at one time one of the major routes between eastern Oregon and the Willamette Valley. Northern Pacific Railroad still utilizes this route for commerce and transport – including transport of hazardous materials. History of Hazardous Materials incidents is high, with more than three or four incidents in recent history requiring a response. Probability is similarly high for another incident in the near future. Vulnerability is considered moderate with 1 to 10% of the population potentially impacted. Maximum threat could involve such events as railroad or truck accident involving toxic release, and is considered to be high. Rupture of underground gas lines is also possible. In the event of occurrence, prevailing wind and proximity to waterways are important factors relating to public safety risk and environmental impacts. See also hazardous materials incident profile in section 3 of the main document.

#### Wildfire

Hazard (Category)	Raw Score	Weighted Score
Wildfire (Overall)	35	215
Wildfire (History)	10	20
Wildfire (Probability)	10	70
Wildfire (Vulnerability)	5	25
Wildfire (Maximum Threat)	10	100

#### Wildfire notes:

Oakridge is surrounded by the Willamette National Forest. While the valley floor is relatively clear of the tall pine trees on the mountain slopes, the community is nonetheless surrounded by country susceptible to wildfire. History of wildfire in the area of Oakridge is high, with more several instances of nearby wildfires impacting the city. The probability of this

continuing in the future is high that a similar pattern will continue. Vulnerability is moderated by response capability, and the removal of vegetation from the urban-wildland interface for fire protection. Maximum threat involves potential for damage to numerous structures and forest tracts, and the potential for a rapidly moving fire to sweep through or over the city under the right conditions. See also wildfire hazard profile in section 3 of the main document.

#### Drought

Hazard (Category)	Raw Score	Weighted Score
Drought (Overall)	26	174
Drought (History)	4	8
Drought (Probability)	8	56
Drought (Vulnerability)	6	30
Drought (Maximum Threat)	8	80

#### Drought notes:

Drought is neither life threatening nor presents a direct risk to structures, but does involve potential for some disruption if dramatic water shortage were to develop. Drought can exacerbate wildfire risk as related hazards, and a water shortage may affect the entire city uniformly. History is considered moderate, with 2 to 3 events occurring over the last 100 years. The probability of this re-occurring is high, part of a normal cycle over time. Vulnerability is medium as Oakridge has access to five sources of river water, and two large reservoirs nearby. Maximum threat is moderately high, particularly when combined with an active fire season. See also drought profile in section 3 of the main document.

#### Volcano

Hazard (Category)	Raw Score	Weighted Score
Volcano (Overall)	19	143
Volcano (History)	2	4
Volcano (Probability)	2	14
Volcano (Vulnerability)	5	25
Volcano (Maximum Threat)	10	100

#### Volcano notes:

Volcano is similar to earthquake in that it occurs very infrequently. Oakridge is situated in the foothills of the Cascade Mountain Range, placing it in closer proximity to dormant Volcanos, the closest being Diamond Peak, a shield volcano approximately 30 miles from the city. History and probability are relatively low, vulnerability is medium, maximum threat considered high if Diamond Peak were to become active. The last eruption occurred over 11,000 years ago. See also volcano profile in section 3 of the main document.

#### Earthquake

Hazard (Category)	Raw Score	Weighted Score
Earthquake (Overall)	17	135
Earthquake (History)	2	4
Earthquake (Probability)	3	21
Earthquake (Vulnerability)	2	10
Earthquake (Maximum Threat)	10	100

#### Earthquake notes:

Earthquake is somewhat unique as it occurs much less frequently but has potential for significant damage and disruption. Oakridge is located near three crustal earthquake faults, and small (1-3 in magnitude) have occurred in the area, doing little damage and often going unfelt by residents. From a geographic standpoint occurrence would presumably effect the entire city uniformly, should a higher magnitude event occur. History of occurrence dates back over long time scales, and in the short term is considered low. Probability is low in any given year. Vulnerability is complex to assess due to varying standards of construction but most newer construction is considered relatively sound. Maximum threat is high in awareness of the Cascadia Subduction Zone off the Oregon Coast, Oakridge can expect to feel the shaking associated with that event, causing very strong shaking according to DOGAMI and the State of Oregon Office of Emergency Management. Minor to moderate damage to numerous structures can be expected in an event of that magnitude and scope. Importance of resiliency of infrastructure is notable. See also earthquake profile in section 3 of the main document.

#### Dam Failure

Hazard (Category)	Raw Score	Weighted Score
Dam Failure (Overall)	15	117
Dam Failure (History)	0	0
Dam Failure (Probability)	1	7
Dam Failure (Vulnerability)	6	30
Dam Failure (Maximum Threat)	8	80

#### Dam Failure notes:

There is no history of dam failure affecting Oakridge and geographic location makes impact low probability. Vulnerability is moderate considering the proximity of the Hills Creek Dam

located less than 5 miles from the city to the south east. Maximum threat is high, as warning time may be very short due to proximity to the dam itself. See also dam failure profile in section 3 of the main document.

#### Landslide

Hazard (Category)	Raw Score	Weighted Score
Landslide (Overall)	14	106
Landslide (History)	1	2
Landslide (Probability)	2	14
Landslide (Vulnerability)	4	20
Landslide (Maximum Threat)	7	70

#### Landslide notes:

Landslide is considered to have very low history and probability in Oakridge itself, though it is higher in the surrounding hillsides. Vulnerability is moderate due to the potential for closures of Hwy 58. Maximum threat is a high medium for the same reason, transportation infrastructure could be affected. See also landslide profile in section 3 of the main document.

#### Pandemic

Hazard (Category)	Raw Score	Weighted Score
Pandemic (Overall)	12	78
Pandemic (History)	2	4
Pandemic (Probability)	2	14
Pandemic (Vulnerability)	4	20
Pandemic (Maximum Threat)	4	40

#### Pandemic notes:

Pandemic is a unique hazard which presents significant public safety risk but no potential for damage to structures. Geographic potential is uniform. History and probability are both low when considering major outbreak of disease. Vulnerability and maximum threat are moderate considering most credible scenarios. See also pandemic profile in section 3 of the main document.

#### **New Development in Hazard Areas**

There was no new development in the City of Oakridge during the planning period. It is noted that areas on south side of the city are designated as Special Flood Hazard Areas and areas to the north and east are steeper, forested slopes.

#### **City of Oakridge: Mitigation Projects**

This section describes mitigation projects identified by Oakridge during the planning process. See Chapter 4, main document for additional information regarding mitigation action item methodology and prioritization.

<u>Mitigation Action Item (a):</u> Safe room retrofit for City Courtroom EOC. Create protected, contained space for city employees and EOC participants. Electrical, communications upgrades. Window, roof, and structural reinforcements, seismic upgrades.

Location	City Hall	
Coordinating Agencies	Oakridge City Council, Oakridge Public Works	
Implementation Timeframe	12-18 Months	
Estimated Cost	\$1.5 million	
Potential Funding Sources	HUD-CDBG, OR-SRGP, HMGP, PDM, FEMA PA-106	
Hazards Mitigated	Earthquake, flood, winter storm, windstorm, dam failure, wild fire	
Comments	City Hall is the location for both Emergency Operation Center, and Continuity of Government	
Current Site Photos		

<u>Mitigation Action Item (b):</u> Seismic, flood-proofing, and storm-hardening retrofit for Oakridge Police Department.

Location	Oakridge Police Department
	Oakridge City Council, Oakridge Police Department, Oakridge Public
Coordinating Agencies	Works, Oakridge City Administrator
Implementation Timeframe	18-24 months
Estimated Cost	\$1 million
Potential Funding Sources	HUD-CDBG, OR-SRGP, HMGP, PDM, FEMA PA-106
Hazards Mitigated	Earthquake, flood, winter storm, windstorm
Comments	The Police Department is the Lower floor of City Hall.

**Current Site Photos** 





<u>Mitigation Action Item (c):</u> Water intake upgrades for secondary surface water source as back-up to ground water system. Additional storage, treatment and transmission capability.

Location	Oakridge wellfield
Coordinating Agencies	Oakridge Public Works
Implementation Timeframe	12-18 months
Estimated Cost	\$1.5 million
Potential Funding Sources	HUD-CDBG-DR, HMGP, PDM, FEMA PA-406
Hazards Mitigated	Drought, hazardous materials incident
Comments	Secondary water source needed as backup for existing surface water system
Current Site Photos	

Mitigation Action Item (d): Retrofit/mitigation reconstruction for community center to serve as disaster recovery center, community safe room. Install secure communications and generator, space heaters and emergency shelter/staging area.

generator, space neaters and	d efficigency shelter/staging area.
Location	
Coordinating Agencies	City of Oakridge, Oakridge Public Works
Implementation Timeframe	24-36 Months
Estimated Cost	\$800,000-900,000
Potential Funding Sources	FEMA, OSRGP
Hazards Mitigated	Earthquake, wildfire, windstorm, flood, HAZMAT incident, winter storm
Comments	
Current Site Photos	

Mitigation Action Item (e): Emergency supply storage building for fire station.

Location	Oakridge Fire Department
Coordinating Agencies	City of Oakridge, Oakridge Public Works, Oakridge Fire Department
Implementation Timeframe	24-36 Months
Estimated Cost	\$400,000-500,000
Potential Funding Sources	FEMA
Hazards Mitigated	Earthquake, wildfire, windstorm, flood, HAZMAT incident, winter storm
Comments	
Current Site Photos	

## City of Oakridge: Hazard Mitigation Plan Implementation and Maintenance

In keeping with standard practices to ensure incorporation of overall goals and strategy of the hazard mitigation plan, City of Oakridge hazard mitigation team members will be invited to participate in future plan development or existing plan update committees. Additionally, this Hazard Mitigation Action Plan will be cited as a technical reference for future plan update processes. Planning documents and mechanisms applicable to this process may include the following:

City of Oakridge Comprehensive Plan

Oakridge Capital Improvement Plans

**Emergency Management Plan** 

Local Community Wildfire Protection Plans

City of Oakridge Floodplain Development Ordinance

**Building Code** 

Subdivision Code

**Erosion Control** 

Stormwater Management

Additionally, progress to implement this plan will be monitored on an ongoing basis by city staff and administration. Annual reviews and update under a 5-year cycle will be pursued. Using these methods the overarching goal of a stronger, safer, more resilient community can be attained.