

City of Wilsonville Addendum to the Clackamas County Multi-Jurisdictional Hazard Mitigation Plan



March 2019

Volume II: Wilsonville Addendum



Prepared for:

City of Wilsonville

Prepared by:

**University of Oregon
Institute for Policy Research and Engagement
Oregon Partnership for Disaster Resilience**

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FEMA

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FEMA

August 6, 2019

The Honorable Jim Bernard
Chair, Clackamas County Commissioners
2020 Kaen Road Suite A
Oregon City, Oregon 97045

Dear Chairman Bernard:

On April 12, 2019, the U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) Region 10, approved the *Clackamas County Multi-Jurisdictional Hazard Mitigation Plan* as a multi-jurisdictional local plan as outlined in Code of Federal Regulations Title 44 Part 201. This approval provides the below jurisdictions eligibility to apply for the Robert T. Stafford Disaster Relief and Emergency Assistance Act's, Hazard Mitigation Assistance (HMA) grants through April 11, 2024, through your state.

Clackamas County	City of Estacada	City of Lake Oswego
City of West Linn	City of Wilsonville	

The updated list of approved jurisdictions includes the cities of West Linn and Wilsonville which recently adopted the *Clackamas County Multi-Jurisdictional Hazard Mitigation Plan*. To continue eligibility, jurisdictions must review, revise as appropriate, and resubmit the plan within five years of the original approval date.

If you have questions regarding your plan's approval or FEMA's mitigation grant programs, please contact Joseph Murray, State Hazard Mitigation Planner with Oregon Military Department, Office of Emergency Management, at 503-378-3929, who coordinates and administers these efforts for local entities.

Sincerely,

Mark Carey, Director
Mitigation Division

Enclosure

JG:vl

RESOLUTION NO. 2755

A RESOLUTION OF THE CITY OF WILSONVILLE FOR ADOPTION OF THE CITY OF WILSONVILLE ADDENDUM TO THE CLACKAMAS COUNTY MULTI-JURISDICTIONAL NATURAL HAZARD MITIGATION PLAN.

WHEREAS, the City of Wilsonville recognizes the threat that natural hazards pose to people, property and infrastructure within our community; and

WHEREAS, undertaking hazard mitigation actions will reduce the potential for harm to people, property and infrastructure from future hazard occurrences; and

WHEREAS, an adopted Natural Hazards Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs and with approval of this NHMP the City will be eligible to apply for the Robert R. Stafford Disaster Relief and Emergency Assistance Act's hazard mitigation project grants through April 11, 2024; and

WHEREAS, the City of Wilsonville adopted the *City of Wilsonville addendum to the Clackamas County Multi-Jurisdictional Natural Hazard Mitigation Plan* to reflect new information contained therein through the creation of a new appendix (Appendix C) via Resolution 2418 on May 20, 2013; and

WHEREAS, Clackamas County has subsequently completed an update to the *Clackamas County Multi-Jurisdictional Natural Hazard Mitigation Plan* of which the City of Wilsonville is party to; and

WHEREAS, the City of Wilsonville needs to update and replaced its addendum to the *Clackamas County Multi-Jurisdictional Natural Hazard Mitigation Plan*; and

WHEREAS, This addendum supplements information contained in Volume I (Basic Plan) which serves as the NHMP foundation and Volume III (Appendices) which provide additional information; and

WHEREAS, the Oregon Office of Emergency Management and Federal Emergency Management Agency, Region X officials have approved the *Clackamas County Multi-Jurisdictional Natural Hazard Mitigation Plan* and pre-approved the *City of Wilsonville Addendum to the Clackamas County Natural Hazard Mitigation Plan* on April 12, 2019; and

WHEREAS, final approval of the City's Addendum by FEMA is contingent upon this official adoption by the City.

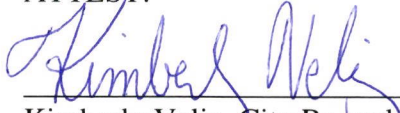
NOW, THEREFORE, THE CITY OF WILSONVILLE RESOLVES AS FOLLOWS:

1. The City adopts *City of Wilsonville Addendum to the Clackamas County Multi-Jurisdictional Natural Hazard Mitigation Plan, (2019 Update)*.
2. The City will submit this Adoption Resolution to the Oregon Office of Emergency Management and Federal Emergency Management Agency, Region X officials to enable final approval of the *City of Wilsonville Addendum to the Clackamas County Multi-Jurisdictional Natural Hazard Mitigation Plan*.
3. This resolution is effective upon adoption.

ADOPTED by the Wilsonville City Council at a regular meeting there of this 17th day of June 2019, and filed with the Wilsonville City Recorder this date.


Tim Knapp, Mayor

ATTEST:


Kimberly Veliz, City Recorder

SUMMARY OF VOTES:

Mayor Knapp	Yes
Council President Akervall	Yes
Councilor Stevens	Yes
Councilor Lehan	Yes
Councilor West	Yes

Exhibit:

- A. City of Wilsonville Addendum to the Clackamas County Multi-Jurisdictional Hazard Mitigation Plan

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Purpose

This is an update of the Wilsonville addendum to the Clackamas County Multi-Jurisdictional Natural Hazard Mitigation Plan (NHMP). This addendum supplements information contained in Volume I (Basic Plan) which serves as the NHMP foundation and Volume III (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 Wilsonville's addendum are further discussed throughout the NHMP and within Volume III, Appendix B, which provides an overview of alterations to the document that took place during the update process.

Wilsonville adopted their addendum to the Clackamas County Multi-jurisdictional NHMP on **June 17, 2019**. FEMA Region X approved the Clackamas County NHMP on **April 12, 2019** and the City's addendum on **August 6, 2019**. With approval of this NHMP the City is now eligible to apply for the Robert T. Stafford Disaster Relief and Emergency Assistance Act's hazard mitigation project grants through **April 11, 2024**.

Mitigation Plan Mission

The NHMP mission states the purpose and defines the primary functions of the NHMP. It is intended to be adaptable to any future changes made to the NHMP and need not change unless the community's environment or priorities change.

The City concurs with the mission statement developed during the Clackamas County planning process (Volume I, Section 3):

Promote sound public policy designed to protect citizens, critical facilities, infrastructure, private property, and the environment from natural hazards.

This can be achieved by increasing public awareness, documenting the resources for risk reduction and loss-prevention, and identifying activities to guide the county towards building a safer, more sustainable community.

Mitigation Plan Goals

Mitigation plan goals are more specific statements of direction that Clackamas County citizens and public and private partners can take while working to reduce the City's risk from natural hazards. These statements of direction form a bridge between the broad mission statement and action items. The goals listed here serve as checkpoints as agencies and organizations begin implementing mitigation action items.

The City concurs with the goals developed during the Clackamas County planning process (Volume I, Section 3). All NHMP goals are important and are listed below in no order of priority. Establishing community priorities within action items neither negates nor eliminates any goals, but it establishes which action items to consider implementing first, should funding become available.

Below is a list of the NHMP goals:

GOAL #1: PROTECT LIFE AND PROPERTY

- Implement activities that assist in protecting lives by making homes, businesses, infrastructure, critical facilities, and other property more resistant to natural hazards.
- Reduce losses and repetitive damages for chronic hazard events while promoting insurance coverage for catastrophic hazards.
- Improve hazard assessment information to make recommendations for discouraging new development and encouraging preventative measures for existing development in areas vulnerable to natural hazards.

GOAL #2: ENHANCE NATURAL SYSTEMS

- Balance watershed planning, natural resource management, and land use planning with natural hazards mitigation to protect life, property, and the environment.
- Preserve, rehabilitate, and enhance natural systems to serve natural hazard mitigation functions.

GOAL #3: AUGMENT EMERGENCY SERVICES

- Establish policy to ensure mitigation projects for critical facilities, services, and infrastructure.
- Strengthen emergency operations by increasing collaboration and coordination among public agencies, non-profit organizations, and business, and industry.
- Coordinate and integrate natural hazards mitigation activities, where appropriate, with emergency operations plans and procedures.

GOAL #4: ENCOURAGE PARTNERSHIPS FOR IMPLEMENTATION

- Strengthen communication and coordinate participation among and within public agencies, citizens, non-profit organizations, business, and industry to gain a vested interest in implementation.
- Encourage leadership within public and private sector organizations to prioritize and implement local, county, and regional hazard mitigation activities.

GOAL #5: PROMOTE PUBLIC AWARENESS

- Develop and implement education and outreach programs to increase public awareness of the risks associated with natural hazards.
- Provide information on tools, partnership opportunities, and funding resources to assist in implementing mitigation activities.

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*.

Wilsonville first developed an addendum to Clackamas County's Natural Hazards Mitigation Plan in 2009. This plan was updated in 2013 and in 2018. The last update of the Wilsonville addendum to the Clackamas County NHMP was approved by FEMA on April 8, 2013.

In addition to establishing a comprehensive community-level mitigation strategy, the Disaster Mitigation Act of 2000 (DMA2K), and the regulations contained in 44 CFR 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 pre-, and post-disaster mitigation project grants.

The Oregon Partnership for Disaster Resilience (OPDR) at the University of Oregon's Institute for Policy Research, and Engagement (IPRE) collaborated with the Oregon Office of Emergency Management (OEM), Clackamas County, and Wilsonville to update their NHMP. This project is funded through the Federal Emergency Management Agency's (FEMA) Fiscal-Year 2016 (FY16) Pre-Disaster Mitigation (PDM) Competitive Grant Program EMS-2017-PC-0005 (PDMC-PL-10-OR-2016-001). Members of the Wilsonville NHMP Hazard Mitigation Advisory Committee (HMAC) also participated in the County NHMP update process (Volume III, Appendix B).

The Clackamas County NHMP, and Wilsonville addendum, are the result of a collaborative effort between citizens, public agencies, non-profit organizations, the private sector, and regional organizations. The Wilsonville HMAC guided the process of developing the NHMP.

Convener

The Wilsonville Director of Public Works serves as the NHMP addendum convener. The convener of the NHMP will take the lead in implementing, maintaining and updating the addendum to the Clackamas County NHMP in collaboration with the designated convener of the Clackamas County NHMP (Clackamas County Resilience Coordinator).

Representatives from the City of Wilsonville HMAC met formally and informally, to discuss updates to their addendum (Volume III, Appendix B). The HMAC reviewed and revised the City's addendum, with 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 Clackamas County Resilience Coordinator, and the OPDR. The changes are highlighted with more detail throughout this document and within Volume III, 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 Wilsonville HMAC was comprised of the following representatives:

- Convener, Delora Kerber, Director of Public Works
- Dan Carlson, Building Official

- Dan Pauly, Senior Planner
- Kerry Rappold, Natural Resource Program Manager
- Jeff Rubin, Tualatin Valley Fire & Rescue, Emergency Manager
- Dan Stark, GIS Manager
- Tim Woodley, West Linn-Wilsonville School District, Director of Operations

Public participation was achieved with the establishment of the HMAC, which was comprised of City officials representing different departments and sectors and members of the public. The HMAC served as the local review body for the NHMP's development. Community members were provided an opportunity for comment via the NHMP review process, and through a survey administered by Clackamas County (Volume III, Appendix G).

NHMP Implementation and Maintenance

The City Council will be responsible for adopting the Wilsonville addendum to the Clackamas County NHMP. This addendum designates a HMAC 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 HMAC will convene after re-adoption of the Wilsonville 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 Director of Public Works will serve as the convener and will be responsible for assembling the HMAC. The HMAC 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 HMAC 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 City will utilize the same action item prioritization process as the County (Volume I, Section 4).

Implementation through Existing Programs

This NHMP is strategic and non-regulatory in nature, meaning that it does not necessarily set forth any new policy. It does, however, provide: (1) a foundation for coordination and collaboration among agencies and the public in the city; (2) identification and prioritization of future mitigation activities; and (3) aid in meeting federal planning requirements and qualifying for assistance programs. The mitigation plan works in conjunction with other city plans and programs including the Comprehensive Land Use Plan, Capital Improvements Plan, and Building Codes, as well as the [Clackamas County NHMP](#), and the [State of Oregon NHMP](#).

The mitigation actions described herein (and in Attachment A) are intended to be implemented through existing plans and programs within the city. Plans and policies already in existence have support from residents, businesses and policy makers. Where possible, Wilsonville will implement the NHMP's recommended actions through existing plans and policies. 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. Implementation opportunities are further defined in action items when applicable.

Future development without proper planning may result in worsening problems associated with natural hazards. Metro, the regional government for Clackamas, Multnomah, and Washington counties, determines many land use laws for the tri-county region and sets the urban growth boundary. The entire Portland Metro area is subject to tremendous growth pressures due to its desirable location and the restrictions on urban sprawl placed by urban growth boundary requirements.

Wilsonville's acknowledged comprehensive plan is the City of Wilsonville Comprehensive Plan (2000, updated August 2013). The Oregon Land Conservation and Development Commission first acknowledged the plan in 1983. The City implements the plan through the Development Code.

Wilsonville currently has the following plans, regulations, and projects that relate to natural hazard mitigation. For a complete list visit the City's [website](#):

- [Comprehensive Plan](#)
- [Development Code](#)
 - [Section 4.139 The Significant Resource Overlay Zone \(SROZ\)](#)
 - [Section 4.171 Protection of Natural Features and Other Resources](#)
 - [Section 4.172 Floodplain Regulations](#)
 - [Section 4.176 Landscaping, Screening, and Buffering](#)
 - [Section 4.177 Street Improvement Standards](#)
 - [Section 4.320 Underground Utilities Requirements](#)
 - [Section 4.500 Willamette River Greenway](#)
 - [Section 4.600 Tree Preservation and Protection](#)
- [Capital Improvement Projects](#)
- [Coffee Creek Master Plan](#)
- [Development Process Guidelines](#)
 - [Natural Resources Process Guidelines](#)
- [Emergency Operations Plan](#)
- [Natural Resources Annexation Policy](#)
- [Transit System Master Plan](#)
- [Transportation Systems Plan](#)
 - [Portland Metro 2014 Regional Transportation Plan](#)
- [Stormwater Master Plan](#)
- [Water System Master Plan](#)

Other plans:

- [Clackamas County Community Wildfire Protection Plan](#)
 - [Tualatin Valley Fire and Rescue](#)

Government Structure

The City of Wilsonville has a council-manager form of government. The City Council consists of five members; a mayor and four councilors. The mayor presides over Council meetings. The mayor and City Council members are elected to four-year terms of office through a general election. The City Council is responsible for identifying problems and needs within the community and then addressing those problems through community goals and objectives.

Community Development is responsible for residential building and planning and monitoring future development. They make recommendations to City Council for changes to the Planning and Land Development Ordinance, Historic District Zones, the Comprehensive Plan and the Zoning Map.

The City of Wilsonville provides a variety of services to promote the safety and welfare of its residents. Public services that support the demands of a growing community include Community Development, Community Services, GIS, Public Safety, and Public Works.

Community Development: Includes Building, Planning, Engineering, Natural Resources, and Urban Renewal. The Department manages development projects within the city and produces the strategic vision of the city.

Community Services: Responsible for maintaining 12 public parks totaling 235 acres and the preservation of opens spaces, trees, creeks, wetlands, and habitat areas.

GIS: Provides mapping and data analysis services to City departments.

Public Safety: Consists of the Municipal Court, Wilsonville Police and Tualatin Valley Fire and Rescue who provide services to enhance the health and safety of Wilsonville residents.

Public Works: Responsible for maintaining streets, streetlights, water, sewer, and stormwater systems and manages the Willamette River Water Treatment and Wastewater Treatment Plants. Public works is also responsible for emergency management and response.

Continued Public Participation

An open public involvement process is essential to the development of an effective NHMP. To develop a comprehensive approach to reducing the effects of natural disasters, the planning process shall include opportunity for the public, neighboring communities, local and regional agencies, as well as, private and non-profit entities to comment on the NHMP during review.¹ Keeping the public informed of the City's efforts to reduce its risk to future natural hazard events is important for successful NHMP implementation and maintenance. The City is committed to involving the public in the NHMP review and update process (Volume I, Section 4). The City posted the plan update for public comment before FEMA approval, and after approval will maintain the plan on the City's website: <https://www.ci.wilsonville.or.us/publicworks/page/emergency-management>.

¹ Code of Federal Regulations, Chapter 44. Section 201.6, subsection (b). 2015

NHMP Maintenance

The Clackamas County NHMP and City addendum will be updated every five years in accordance with the update schedule outlined in the Disaster Mitigation Act of 2000. During the County NHMP update process, the City will also review and update its addendum (Volume I, Section 4). The convener will be responsible for convening the HMAC to address the questions outlined below.

- Are there new partners that should be brought to the table?
- Are there new local, regional, state or federal policies influencing natural hazards that should be addressed?
- Has the community successfully implemented any mitigation activities since the NHMP was last updated?
- Have new issues or problems related to hazards been identified in the community?
- Are the actions still appropriate given current resources?
- Have there been any changes in development patterns that could influence the effects of hazards?
- Have there been any significant changes in the community's demographics that could influence the effects of hazards?
- Are there new studies or data available that would enhance the risk assessment?
- Has the community been affected by any disasters? Did the NHMP accurately address the impacts of this event?

These questions will help the HMAC determine what components of the mitigation plan need updating. The HMAC will be responsible for updating any deficiencies found in the NHMP.

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) were first developed during the 2009 NHMP planning process and revised during subsequent NHMP updates. During these processes, the HMAC assessed the City's risk, identified potential issues, and developed a mitigation strategy (action items).

During the 2018 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 III, Appendix B for more information on changes to action items).

Priority Action Items

Table WA-1 presents a list of mitigation actions. The HMAC decided to modify the prioritization of action items in this update to reflect current conditions (risk assessment), needs, and capacity. High priority actions are shown in **bold** text with grey highlight. The City will focus their attention, and resource availability, upon these achievable, high leverage, activities over the next five-years. Although this methodology provides a guide for the HMAC in terms of implementation, the HMAC has the option to implement any of the action items at any time. This option to consider all action items for implementation allows the

committee to consider mitigation strategies as new opportunities arise, such as capitalizing on funding sources that could pertain to an action item that is not currently listed as the highest priority. Refer to Attachment A for detailed information for each action. Full text of the plan goals referenced in Table WA-1 is located on page WA-2.

Table WA-I Wilsonville Action Items

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Internal Partners	Timing	Plan Goals Addressed				
					Goal 1	Goal 2	Goal 3	Goal 4	Goal 5
MH #1	Develop public education programs to inform the public about methods for mitigating the impacts of natural hazards.	Planning	Tualatin Valley Fire & Rescue, Hazard Mitigation Advisory Committee	Ongoing	✓		✓	✓	✓
MH #2	Integrate the goals and action items from the Natural Hazards Mitigation Plan into existing regulatory documents and programs, where appropriate.	Planning	Public Works, Building, Planning Commission, Natural Resources	Ongoing	✓	✓	✓	✓	✓
MH #3	Continue vegetation management throughout the city.	Natural Resources	Planning, Public Works, Parks	Ongoing			✓		✓
EQ #1	Conduct seismic evaluations of the Community Center and other critical and essential facilities and implement appropriate structural mitigation strategies.	Community Development, Public Works	Building, Engineering	Long Term	✓	✓	✓		
EQ #2	Perform non-structural mitigation on public facilities to improve life safety standards.	Human Resources	Building, Engineering	Ongoing	✓		✓		✓
EQ #3	Seismically retrofit Willamette Water Treatment Plant and Intake Facility	Engineering	Building	Long Term	✓		✓		

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Internal Partners	Timing	Plan Goals Addressed				
					Goal 1	Goal 2	Goal 3	Goal 4	Goal 5
EQ #4	Complete the French Prairie Bridge, including accommodation of emergency vehicle passage.	Engineering	Building	Long Term	✓		✓	✓	
FL #1	Ensure continued compliance in the National Flood Insurance Program (NFIP) through enforcement of local floodplain management ordinances.	Community Development	GIS, Planning	Ongoing	✓			✓	
FL #2	Coordinate with the Oregon Department of Transportation (ODOT) to increase the capacity of culverts.	Community Development	Engineering, Public Works	Ongoing	✓			✓	
FL #3	Implement the recommendations found in the Stormwater Master Plan.	Natural Resources	Planning, Public Works	Ongoing	✓	✓	✓	✓	
SW #1	Reduce negative effects from severe windstorm and severe winter storm events.	Community Development	Public Works	Ongoing	✓	✓	✓	✓	✓
WF #1	Coordinate wildfire mitigation action items through the Clackamas County Community Wildfire Protection Plan.	TVF&R	Public Works, Parks and Recreation, Natural Resources	Ongoing	✓	✓	✓	✓	✓

Source: City of Wilsonville HMAc, 2018

Note: Full text of the plan goals referenced in this table is located on page WA-2.

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, Section 3 and Volume III, Appendix C. The risk assessment process is graphically depicted in Figure WA-1. Ultimately, the goal of hazard mitigation is to reduce the area of risk, where hazards overlap vulnerable systems.

Figure WA-1 Understanding Risk



Hazard Analysis

The Wilsonville HMA developed their hazard vulnerability assessment (HVA), using their previous HVA and the County’s HVA as a reference. Changes from their previous HVA and the County’s HVA were made where appropriate to reflect distinctions in vulnerability and risk from natural hazards unique to Wilsonville, which are discussed throughout this addendum.

Table WA-2 shows the HVA matrix for Wilsonville 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 hazard.

Two catastrophic hazards (Cascadia Subduction Zone earthquake and Crustal earthquake) and one chronic hazard (winter storm) rank as the top hazard threats to the City (Top Tier). Wildfire, extreme heat, drought, and windstorm comprise the next highest ranked hazards (Middle Tier), while flood, volcanic event, and landslide hazards comprise the lowest ranked hazards (Bottom Tier).

Table WA-2 Hazard Analysis Matrix – Wilsonville

Hazard	Maximum				Total Threat Score	Hazard Rank	Hazard Tiers
	History	Vulnerability	Threat	Probability			
Earthquake - Cascadia	4	45	100	28	177	#1	Top Tier
Earthquake - Crustal	6	50	100	21	177	#1	
Winter Storm	16	30	70	49	165	#3	
Wildfire	12	25	70	35	142	#4	Middle Tier
Extreme Heat	16	20	40	56	132	#5	
Drought	10	15	50	56	131	#6	
Windstorm	14	15	50	42	121	#7	
Flood	8	20	30	42	100	#8	Bottom Tier
Volcanic Event	2	15	50	14	81	#9	
Landslide	6	15	20	21	62	#10	

Source: Wilsonville HMAC, 2018.

Table WA-3 categorizes the probability and vulnerability scores from the hazard analysis for the City and compares the results to the assessment completed by the Clackamas County HMAC. Variations between the City and County are noted in **bold** text within the city ratings.

Table WA-3 Probability and Vulnerability Comparison

Hazard	Wilsonville		Clackamas County	
	Probability	Vulnerability	Probability	Vulnerability
Drought	High	Low	High	Low
Earthquake - Cascadia	Moderate	High	Moderate	High
Earthquake - Crustal	Low	High	Low	High
Extreme Heat	High	Moderate	Low	High
Flood	Moderate	Moderate	High	Moderate
Landslide	Low	Low	High	Low
Volcanic Event	Low	Low	Low	Moderate
Wildfire	Moderate	Moderate	High	Moderate
Windstorm	Moderate	Low	Moderate	Low
Winter Storm	Moderate	Moderate	Moderate	Moderate

Source: Wilsonville and Clackamas County HMAC, 2018.

Community Characteristics

Table WA-4 and the following section provides information on City specific demographics and assets. 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. Between 2010 and 2016 the City grew by 4,215 people (22%; as of 2018 the population was 25,250) and median household income increased by about 2%.² Between 2018 and 2040 the population is forecast to grow by 7% to 27,046.³ In 2016, the city annexed 10.6 acres along SW Garden Acres Rd into the City. New development has complied with the standards of the [Oregon Building Code](#) and the city's development code.

Transportation/Infrastructure

Located on Interstate 5, transportation has played a major role in shaping Wilsonville's community and economy. Wilsonville's Commercial areas are located near primary routes and residential development are nearby. Interstate 5 has two exits in Wilsonville, one in the North where Boones Ferry Road becomes Ellingsen Road, and one in the South at Wilsonville Road. The Kinsman Road expansion project was completed in 2018 and included expansion of sewer and drinking water pipelines.

Motor vehicles represent the dominant mode of travel through and within Wilsonville. The City's public transit is provided by the South Metro Area Regional Transit (SMART) system, which operates seven routes within Wilsonville and connects with Portland's TriMet transit system at the Commerce Circle Station. SMART also connects with both Canby's and Salem's public transit systems. The City of Wilsonville also hosts freight rail services provided by the Portland and Western Railroad. There are no port services available where the Willamette River crosses through Wilsonville, but there is a recreational marina located across the river from Boones Ferry Park.

Economy

Wilsonville's proximity to major transportation routes and access to rail has made it a desirable place for commercial and industrial development. The city's residents work in a variety of industries, with "professional and related occupations" (24% of workforce) and "management, business, and financial operations occupations" (18%) accounting for the top two occupations.⁴

Wilsonville has an economic advantage due to its location at the north end of the Willamette Valley and its proximity to Portland. Wilsonville's industrial sites are made accessible through I-5 and I-205. High-tech companies in advanced imaging and design as well as distribution centers and manufacturers have located to Wilsonville. These companies included APCON, Inc., Coca-Cola Bottling of Oregon, Coherent, Crimson Trace Corp., FOODesign Machinery & Systems, Inc., FLIR Systems, InFocus, Kinetics, Mentor Graphics, OrePac, Rite Aid Distribution Center, Sysco Food Services, and Xerox Corporation.

² Portland State University, Population Research Center, "Annual Population Estimates", 2016 & 2018 and Social Explorer, Table T57, U.S. Census Bureau, 2012-2016 and 2006-2010 American Community Survey Estimates.

³ Metro, 2040 Distributed Forecast (2016).

⁴ Social Explorer, Table 50, U.S. Census Bureau, 2012-2016 American Community Survey Estimates

Table WA-4 Community Characteristics

Population Characteristics		
2010 Population	19,525	
2016 Population [2018 Population]	23,740	[25,250]
2040 Forecasted Population*	27,046	
Race (non-Hispanic) and Ethnicity (Hispanic)		
White		75%
Black/ African American		1%
American Indian and Alaska Native		1%
Asian		4%
Native Hawaiian and Other Pacific Islander		1%
Some Other Race		0%
Two or More Races		4%
Hispanic or Latino		14%
Limited or No English Spoken		5%
Vulnerable Age Groups		
Less than 15 Years	3,927	18%
65 Years and Over	3,092	14%
Disability Status		
Total Population	1,752	9%
Children	108	2%
Seniors	925	30%
Income Characteristics		
Households by Income Category		
Less than \$15,000	585	7%
\$15,000-\$29,999	1,009	12%
\$30,000-\$44,999	1,373	16%
\$45,000-\$59,999	1,153	13%
\$60,000-\$74,999	981	11%
\$75,000-\$99,999	1,002	12%
\$100,000-\$199,999	1,950	23%
\$200,000 or more	614	7%
Median Household Income	\$63,097	
Poverty Rates		
Total Population	2,032	10%
Children	588	13%
Seniors	217	7%
Housing Cost Burden		
Owners with Mortgage	1,169	31%
Renters	2,001	41%

Source: U.S. Census Bureau, 2012-2016 American Community Survey; Portland State University, Population Research Center, "Annual Population Estimates", 2016 & 2018. [Metro, 2040 Distributed Forecast](#). Note: * = Population forecast within Metro UGB

Housing Characteristics		
Housing Units		
Single-Family	4,284	47%
Multi-Family	4,635	51%
Mobile Homes	137	2%
Year Structure Built		
Pre-1970	255	3%
1970-1989	2,987	33%
1990 or later	5,825	64%
Housing Tenure and Vacancy		
Owner-occupied	3,777	42%
Renter-occupied	4,890	54%
Seasonal	0	0%
Vacant	400	4%

Wilsonville has grown substantially since its incorporation in 1969 and has an area today of 7.6 square miles. It is in the western region of Clackamas County, located about 26 miles south of the Washington border and southwest of the City of Portland. The City is within the Willamette River watershed.

The city is on Interstate 5 and about 26 miles south of the Washington border and at the northern end of the Willamette Valley at 154 feet above sea level. Because of its location Wilsonville’s climate is consistent with the Marine west coast climate zone, with warm summers and cool, wet winters. Wilsonville receives most of its rainfall between October and May, and averages 42 inches of rain, and less than one (1) inch of snow, per year.⁵

According to the [Comprehensive Plan](#), land has been designated for public, industrial, commercial, and residential use The [Significant Resource Overlay Zone \(SROZ\) map](#) identifies areas where development is prohibited. The SROZ includes 780 acres of land and has a 25-foot buffer zone where building applications and city staff work together to decide on the ultimate “no build” boundary for individual sites.⁶

⁵ “[Monthly Average for Wilsonville, OR](#)” The Weather Channel Interactive, Inc. Retrieved November 1, 2018.

⁶ Wilsonville, Oregon. 2015 Development Code. § [4.139.00 thru 4.139.11](#)

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 Wilsonville. It is important to note that the facilities identified as “critical” and “essential” are characterized differently than the structural code that identifies buildings as “essential” and “non-essential.” The structural code uses different language and criteria and therefore have completely different meanings than the buildings identified in this addendum.

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.

Table WA-5 Critical Facilities in Wilsonville

Facility	Drought	Earthquake	Extreme Heat	Flood	Landslide	Volcanic Event	Wildfire	Windstorm	Winter Storm
Critical Facilities									
City Hall/EOC									
Fleet Services									
Public Works/Police Station/EOC #2		X							
Fire Stations									
Station 52 (Kinsman Road – west side)									
Station 56 (Elligsen Road – northeast)									
Potential Shelter Sites									
Lowrie Primary School (West side)									
Meridian Creek Middle School (East side)									
SpringRidge at Charbonneau (southeast)		X							

Hazardous Materials:

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. Those sites that store, manufacture, or use potentially hazardous materials include: Kinder Morgan Pipeline, Northwest Natural Pipeline, and Sysco.

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.

Table WA-6 Essential Facilities in Wilsonville

Facility	Drought	Earthquake	Extreme Heat	Flood	Landslide	Volcanic Event	Wildfire	Windstorm	Winter Storm
Essential Facilities									
Schools									
Arts and Technology High (Art Tech High)									
Boeckman Creek Primary School					X				
Boones Ferry Primary School									
Clackamas Community College									
Inza R. Wood Middle School		X		X					
Learning Tree Pre-school (to 4th grade)									
Lowrie Primary School									
Mentor Child Development Center		X							
Meridian Creek Middle School									
Oregon Institute of Technology		X							
Wilsonville High School					X				
Food Providers									
Costco (+ pharmacy)									
Fred Meyer's (+ pharmacy)		X							
Safeway		X							
Sysco									
Target (+ pharmacy)									
Pharmacies									
McKesson HBOC distribution center									
Rite Aid									
Rite Aid distribution center									
Walgreens									
Other Essential Facilities									
Coffee Creek Correctional Facility									
Community Center									
Library									
Parks and Recreation Facility									
Providence Medical Facility									

Critical Infrastructure:

Infrastructure that provides necessary services for emergency response include:

Table WA-7 Critical Infrastructure in Wilsonville

Facility	Drought	Earthquake	Extreme Heat	Flood	Landslide	Volcanic Event	Wildfire	Windstorm	Winter Storm
Critical Infrastructure									
Arterials									
*designates road maintained by others									
I-5*							X		X
95th Ave									
Barber Street									
Boberg Road									
Boeckman Road				X					
Boones Ferry Road									
Brown Road									
Canyon Creek Road									
Coffee Lake Drive									
Day Road*									
Elligsen Road							X		
French Prairie Drive									
Grahams Ferry Road*									
Kinsman Road									
Miley Road*									
Parkway Avenue									
Parkway Center Drive									
Ridder Road									
Stafford Road*									
SW Touchman									
Town Center Loop									
Wilsonville Road									
Bridges									
Arrowhead Creek Lane Bridge									
Barber Street Bridge									
Boeckman Road Bridge									
Boone's Bridge (I-5/Willamette River)		X							
Creek Lane Bridge									
I-5/Wilsonville Road, Boeckman Road and Elligsen Road overpasses									
Wilsonville Road/Boeckman Creek Bridge									
Other Critical Infrastructure									
Charbonneau Reservoir									

Facility	Drought	Earthquake	Extreme Heat	Flood	Landslide	Volcanic Event	Wildfire	Windstorm	Winter Storm
Critical Infrastructure									
City wells									
Communication Tower - Elligsen									
Communication Tower - Pioneer Court		X							
Communication Tower - Villebois									
Communication Tower – 1 st Street									
Electric substations									
Freight tracks									
First Student Fleet & Dispatch									
Kinder Morgan Gas Line									
Level B Reservoir									
Level C Reservoir									
Northwest Natural Gas Line									
Power lines									
Pump stations		X		X					
Republic Waste Services									
SMART Transit Facility (WES Commuter Rail Site)									
Waste Water Treatment Plant – 1 st Street									
Water Treatment Plant – Arrowhead									

Cultural and Historic Assets

The cultural and historic heritage of a community is more than just tourist charm. For families that have lived in the city for generations and new resident alike, it is the unique places, stories, and annual events that make Wilsonville an appealing place to live. The cultural and historic assets are both intangible benefits and obvious quality-of-life-enhancing amenities. Because of their role in defining and supporting the community, protecting these resources from the impact of disasters is important. Cultural and historic assets include: CREST Environmental Learning Center, Fir Point Farm, Murase Plaza, Old Town (Historic), Oregon Korean War Museum, and Tauchman House in Boones Ferry Farm. Due to their historic nature many of these facilities are vulnerable to the earthquake hazard.

Economic Assets/Population Centers:

Economic assets include businesses that employ large numbers of people and provide an economic resource to the city of Wilsonville. If damaged, the loss of these economic assets could significantly affect economic stability, and prosperity. Population Centers usually are aligned with economic centers, and are a concern during evacuation/notification during a hazard event include:

Table WA-8 Economic Assets/Population Centers in Wilsonville

Facility	Drought	Earthquake	Extreme Heat	Flood	Landslide	Volcanic Event	Wildfire	Windstorm	Winter Storm
Economic Assets / Population Centers									
APCON, Inc									
Argyle Square									
Charbonneau Village Town Center									
Coherent									
Crimson Trace Corporation									
DW Fitz									
FLIR Systems		X							
FOODesign Machinery and Systems, Inc		X							
Georgia Pacific									
Kinetics									
Mentor Graphics									
Old Town Square									
OrePac									
Pacific Foods Distribution Center									
Pacific Pride		X							
Prologic									
Republic Waste Management									
Rite Aid Distribution Center									
Rockwell Collins									
Southern Wine & Spirits									
Swire Coca-Cola of Oregon									
Sysco Food Services of Portland, Inc									
Tarr fueling									
Wilsonville Chamber of Commerce		X							
Wilsonville Concrete									
Xerox Corporation									

Environmental Assets:

Environmental assets are those parks, green spaces, wetlands, and rivers that provide an aesthetic, and functional ecosystem services for the community include:

Table WA-9 Environmental Assets in Wilsonville

Facility	Drought	Earthquake	Extreme Heat	Flood	Landslide	Volcanic Event	Wildfire	Windstorm	Winter Storm
Environmental Assets									
Arrowhead Creek									
Basalt Creek				X					
Boeckman Creek							X		
Boeckman Creek Crossing Trail							X		
Boones Ferry Park (cultural/historic asset)									
Canyon Creek									
Canyon Creek Park									
Charbonneau Golf Course		X							
Coffee Creek									
Coffee Lake Wetlands				X					
Community Garden									
Courtside Park									
Graham Oaks Nature Park and Trailhead (cultural/historic asset)		X							
Hathaway Park									
Memorial Park (cultural/historic asset)									
Meridian Creek									
Merryfield Park									
Palermo Park									
River Fox Park									
Sofia Park									
Town Center Park (cultural/historic asset)		X							
Tranquil Park									
Villebois park system									
Willamette River				X					
Willamette River Water Treatment Plant Park									
Willow Creek Landover Park									

Vulnerable Populations:

Vulnerable populations, including seniors, disabled citizens, women, and children, as well as those people living in poverty, often experience the impacts of natural hazards and disasters more acutely. Populations that have special needs or require special consideration include:

Table WA-10 Vulnerable Populations in Wilsonville

Facility	Drought	Earthquake	Extreme Heat	Flood	Landslide	Volcanic Event	Wildfire	Windstorm	Winter Storm
Vulnerable Populations									
Coffee Creek Correctional Facility			X				X	X	
Day care facilities		X	X					X	X
Schools (see list under essential facilities)									
Senior Care Facilities									
Avalon Adult Center		X	X					X	
Brookdale		X	X					X	
Marquis Care at Wilsonville		X	X					X	
Springridge Court at Charbonneau		X	X					X	
The Wilsonville		X	X					X	
Other Facilities									
Charleston at Villebois			X						
Creekside Woods		X	X					X	
Rainwater Gardens at Villebois			X						
Renaissance at Villebois			X						

Hazard Characteristics

Drought

The HMAC determined that the City's probability for drought is **high** and that their vulnerability to drought is **low**. *The probability rating increased, and the vulnerability rating did not change, since the previous version of this NHMP addendum.*

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

The City of Wilsonville Public Works Department manages Wilsonville's water supply. Wilsonville houses one large water intake facility and water treatment plant, which provides water to both the City of Wilsonville and the City of Sherwood. The City draws its water supply from the Willamette River, the City of Wilsonville and Tualatin Valley Water District (TVWD) have plans to develop additional facilities at Wilsonville to expand its water supply by 2026. This expanded infrastructure will also supply water to Beaverton and Hillsboro

residents. In addition to the Willamette water supply, Wilsonville also has eight local emergency wells available for use in the event of a drought.

Vulnerability Assessment

Due to insufficient data and resources, Wilsonville is currently unable to perform a quantitative risk assessment, or exposure analysis, for this hazard. For a list of facilities and infrastructure vulnerable to this hazard see the Community Assets section and Tables WA-5 through WA-10.

Mitigation Activities

The existing drought hazard mitigation activities are conducted at the county, regional, state, and federal levels and are described in the Clackamas County NHMP.

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

Earthquake (Cascadia Subduction Zone)

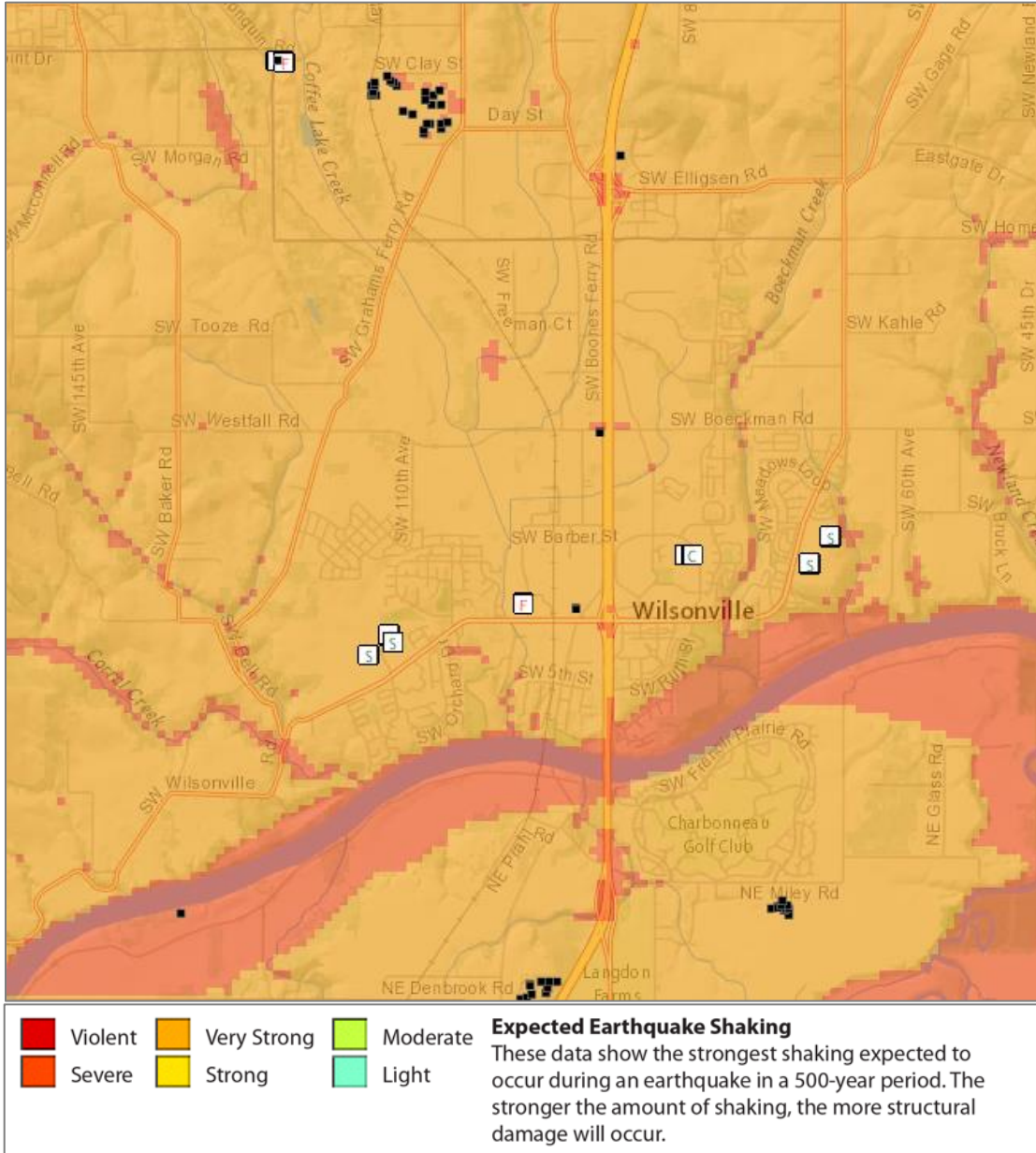
The HMAC determined that the City's probability for a Cascadia Subduction Zone (CSZ) earthquake is **moderate** and that their vulnerability to a CSZ earthquake is **high**. *The probability rating increased, and the vulnerability rating did not change, since the previous version of this NHMP addendum. Previously, the earthquake hazard profile was a single risk assessment, which is now divided into two separate earthquake hazards: Cascadia Subduction Zone (CSZ) earthquake and Crustal earthquake.*

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 Wilsonville as well. The causes and characteristics of an earthquake event are appropriately described within the 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 Wilsonville as well.

Within the Northern Willamette Valley/Portland Metro Region, three potential faults and/or zones can generate high-magnitude earthquakes. These include the Cascadia Subduction Zone, Portland Hills Fault Zone, and Gales Creek-Newberg-Mt. Angel Structural Zone (discussed in the crustal earthquake section).

Figure WA-2 displays relative shaking hazards from a Cascadia Subduction Zone earthquake event. As shown in the figure, most of the city is expected to experience very strong shaking (orange), while areas near rivers and streams will experience severe (light red) to violent (dark red) shaking in a CSZ event.

Figure WA-2 Cascadia Subduction Zone Expected Shaking



Source: [Oregon HazVu: Statewide Geohazards Viewer \(DOGAMI\)](#)

Note: To view detail click the link above to access Oregon HazVu.

Cascadia Subduction Zone

The Cascadia Subduction Zone is a 680-mile-long zone of active tectonic convergence where oceanic crust of the Juan de Fuca Plate is subducting beneath the North American continent at a rate of 4 cm per year. Scientists have found evidence that 11 large, tsunami-producing earthquakes have occurred off the Pacific Northwest coast in the past 6,000 years. These earthquakes took place roughly between 300 and 5,400 years ago with an average

occurrence interval of about 510 years. The most recent of these large earthquakes took place in approximately 1700 A.D.⁷

The city'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 city 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 the city predominately within the "Valley Zone" (Valley Zone, from the summit of the Coast Range to the summit of the Cascades). Within the Northwest 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.

Community assets located in the center of the city include Flir Systems, FOODesign Machinery & Systems, Inc., Pacific Pride, WES commuter rail station, Mentor Graphics Child Development Center, and a pump/lift station. Another high impact area is located within Charbonneau and includes the Charbonneau Village Town Center. If a large earthquake were to occur the biggest vulnerability would be reaching the Charbonneau neighborhood because it is located across the Willamette River from the rest of the city. The Boone Bridge that provides access to Charbonneau has had seismic retrofit work done, but this does not guarantee use in a large event. Additionally, Wood Middle School is in a high impact area.

Earthquake (Crustal)

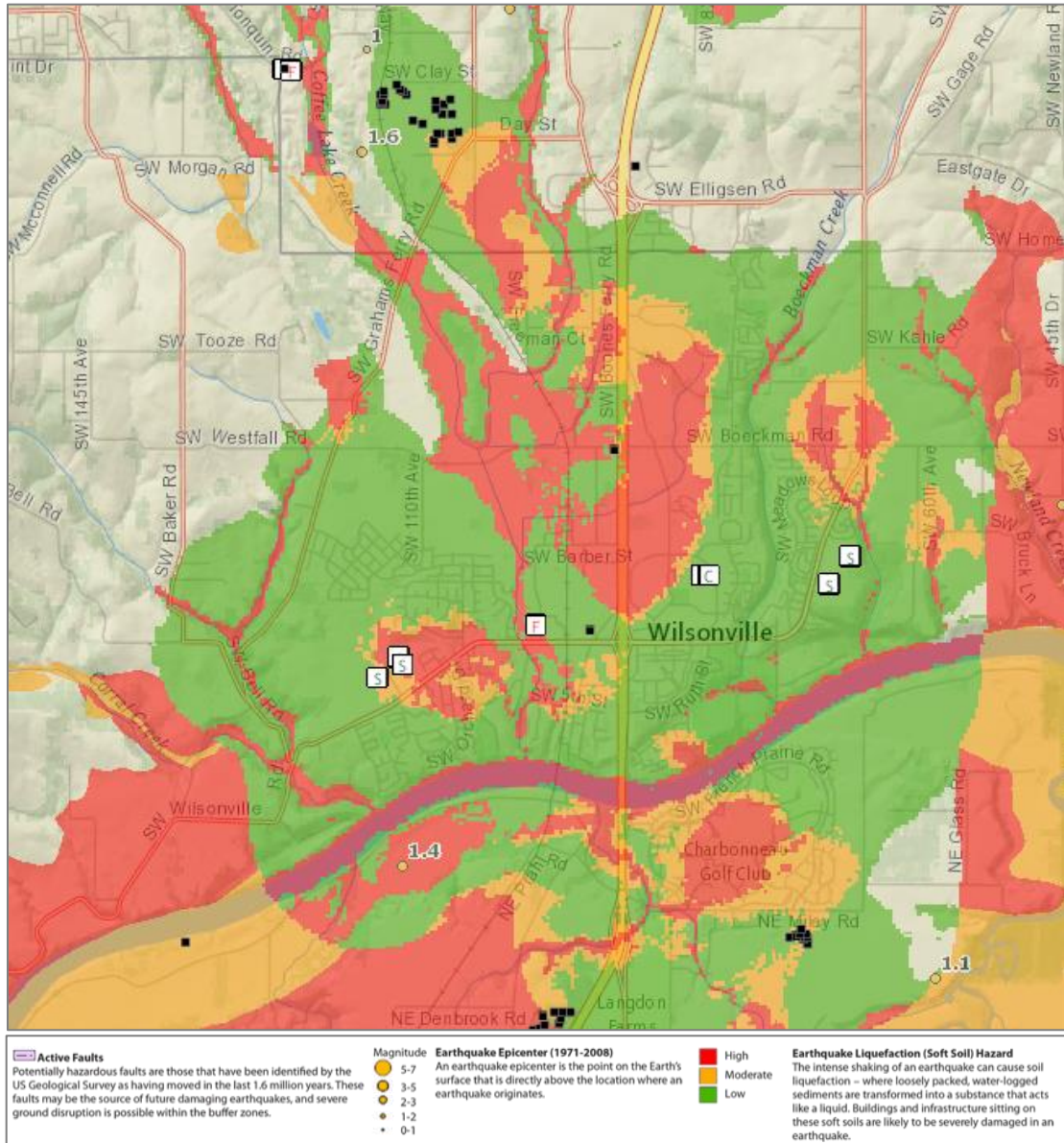
The HMAC determined that the City's probability for a crustal earthquake is **low** and that their vulnerability to crustal earthquake is **high**. *These ratings did not change since the previous version of this NHMP addendum. Previously, the earthquake hazard profile was a single risk assessment, which is now divided into two separate earthquake hazards: Crustal earthquake, and Cascadia Subduction Zone (CSZ) earthquake.*

Volume I, Section 2 describes the causes and 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 Wilsonville as well. Figure WA-3 shows a generalized geologic map of the Wilsonville area that includes the areas for potential regional active faults, earthquake history (1971-2008), and soft soils (liquefaction) hazard. The figure shows the areas of greatest concern within the City limits as red and orange.

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.

⁷ The Cascadia Region Earthquake Workgroup, 2005. Cascadia Subduction Zone Earthquakes: A magnitude 9.0 earthquake scenario. <http://www.crew.org/PDFs/CREWSubductionZoneSmall.pdf>

Figure WA-3 Active Crustal Faults, Epicenters (1971-2008), and Soft Soils



Source: [Oregon HazVu: Statewide Geohazards Viewer \(DOGAMI\)](#)

Note: To view detail click the link above to access Oregon HazVu

There are two potential crustal faults and/or zones near the City that can generate high-magnitude earthquakes. These include the Gales Creek-Mt. Angel Structural Zone and Portland Hills Fault Zone (discussed in greater detail below). Other nearby faults include the Bolton fault and Oatfield faults which run through the city west and east side respectively, Canby-Molalla structural zones located west of the city, and the Mt. Hood Fault in eastern Clackamas County. Historical records count over 56 earthquakes in the Portland-metro area. The more severe ones occurred in 1877, 1880, 1953 and 1962. The most recent severe earthquake was the March 25, 1993 Scotts Mills quake. It was a 5.6 magnitude quake with aftershocks continuing at least through April 8.

Portland Hills Fault Zone

The Portland Hills Fault Zone is a series of NW-trending faults that vertically displace the Columbia River Basalt by 1,130 feet and appear to control thickness changes in late Pleistocene (approx. 780,000 years ago) sediment. The fault zone extends along the eastern margin of the Portland Hills for 25 miles and lies about 11 miles northeast of Wilsonville.

Vulnerability Assessment

Due to insufficient data and resources, Wilsonville is currently unable to perform a quantitative risk assessment for this hazard. However, in 2018 the Department of Geology and Mineral Industries (DOGAMI) completed a regional impact analysis for earthquakes originating from the Cascadia Subduction Zone and Portland Hills faults ([O-18-02](#)), findings from that report are provided at the end of the crustal earthquakes hazard section.

Seismic building codes were implemented in Oregon in the 1970s, however, stricter standards did not take effect until 1991 and early 2000s. As noted in the community profile, approximately 36% 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 WA-11; 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 two (2) have a high (greater than 10% chance) collapse potential. *Note: two fire stations and the police station have been, or are scheduled to be, seismically retrofitted or rebuilt.*

For a list of facilities and infrastructure vulnerable to this hazard see the Community Assets section and Tables WA-5 through WA-10. 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.

Mitigation Activities

Wilsonville has taken mitigation steps to reduce the city's vulnerability in earthquake events. City Hall and the water treatment plant are up to the newest building codes, meaning these buildings can be occupied even after large earthquake events. Seismic retrofit grant awards per the [Seismic Rehabilitation Grant Program](#)⁸ have been funded to retrofit Public

⁸ 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.

Works/Police Station (Phase Two of 2015-2017 grant award, \$251,685). A \$77.5 million bond measure (34-133) was passed in 2006 by southeast Portland metro-area voters to correct seismic safety deficiencies at Tualatin Valley Fire and Rescue Fire Station 52 and to replace Fire Station 56. ODOT has seismically upgraded Boone Bridge, but specifics on this project are not known.

Table WA-II Rapid Visual Survey Scores

Facility	Site ID*	Level of Collapse Potential			
		Low (<1%)	Moderate (>1%)	High (>10%)	Very High (100%)
Schools					
Arts & Technology High (29796 SW Town Center Loop E)	N/A	X			
Boeckman Creek Primary (6700 SW Wilsonville Rd)	Clac_sch71	X			
Boones Ferry Primary (11495 SW Wilsonville Rd)	Clac_sch84	X			
CCC Wilsonville Campus (29353 Town Center Loop E)	Clac_Coc08				X
Inza R. Wood Middle (11055 SW Wilsonville Rd.)	Clac_sch92			X, X	
Wilsonville High (6800 SW Wilsonville Rd)	Clac_sch77	X			
Learning Tree Day School (29880 Town Center Loop W)	N/A	<i>2007 RVS report did not include structural appendix for this facility</i>			
Lowrie Primary School (28995 SW Brown Rd)	N/A	<i>2007 RVS report did not include structural appendix for this facility</i>			
Meridian Creek Middle School (6300 SW Hazel St)	N/A	<i>2007 RVS report did not include structural appendix for this facility</i>			
Public Safety					
Fire Station 52 (TVF&R) (29875 Kinsman Rd)	Clac_fir34	Seismic retrofit of entire building via 2006 bond.			
Fire Station 56 & South Operating Center (TVF&R) (8445 Elligsen Rd)	Clac_fir54	Facility rebuilt via 2006 bond.			
Public Works/Police Station (30000 Town Center Loop E)	N/A	Mitigated per 2015-2017 SRGP grant.			
Hospital					
Providence Medical Plaza (29345 SW Town Center Loop)	N/A	2007 RVS report did not include structural appendix for this facility			

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

Note: Bold indicates facilities that have been seismically retrofitted or rebuilt.

Earthquake Regional Impact Analysis

In 2018 DOGAMI completed a regional impact analysis for earthquakes originating from the Cascadia Subduction Zone and Portland Hills faults ([O-18-02](#)). Their study focused on damage to buildings, and the people that occupy them, and to two key infrastructure

sectors: electric power transmission and emergency transportation routes. Each earthquake was studied with wet and dry soil conditions and for events that occur during the daytime (2 PM) and night time (2 AM). Impacts to buildings and people were tabulated at the county, jurisdictional (city), and neighborhood unit level. Estimated damaged varied widely across the study area depending on local geology, soil moisture conditions, type of building, and distance from the studied faults. In general, damage from the Cascadia Subduction Zone scenario was greater in the western portion of the study area, however, damage could still be significant in some areas east of the Willamette River. The report found that damage to high-value commercial and industrial buildings was high since many of these facilities are in areas of high to very high liquefaction hazard. Casualties were higher during the daytime scenario (generally double) since more people would be at work and occupying non-wood structures that fare worse in an earthquake. The Portland Hills fault scenario created greater damages than the Cascade Subduction Zone scenario due primarily to its placement relative to population centers and regional assets; however, at distances 15 or more miles from the Portland Hills fault the damages from the Cascadia Subduction Zone scenario generally were higher. In both the Cascadia Subduction Zone and Portland Hills Fault scenarios it is forecasted that emergency transportation routes will be fragmented, affecting the distribution of goods and services, conditions are worse under the Portland Hills Fault scenario. Portions of the electric distribution system are also expected to be impacted under both scenarios, however, the impact is considerably less than it is to the transportation routes. Additional, capacity or redundancy within the electric distribution network may be beneficial in select areas that are likely to have greater impacts.

Table WA-12 shows the permanent resident population that are vulnerable to injury or death (casualty) and the buildings in the City that are susceptible to liquefaction and landslides, it does not predict that damage will occur in specific areas due to either liquefaction or landslide. More population and property are exposed to higher degrees of expected damage or casualty under the Portland Hills Fault “wet” scenario than in any other scenario.

Table WA-12 Expected damages and casualties for the CSZ fault and Portland Hills fault: earthquake, soil moisture, and event time scenarios

	Cascadia Subduction Zone (M9.0)		Portland Hills Fault (M6.8)	
	"Dry" Soil	"Wet" Saturated Soil	"Dry" Soil	"Wet" Saturated Soil
Number of Buildings	5,492	5,492	5,492	5,492
Building Value (\$ Million)	4,410	4,410	4,410	4,410
Building Repair Cost (\$ Million)	291	423	406	681
Building Loss Ratio	7%	10%	9%	15%
Debris (Thousands of Tons)	155	196	196	283
Long-Term Displaced Population	147	894	181	1,616
Total Casualties (Daytime)	199	315	255	505
Level 4 (Killed)	7	14	9	24
Total Casualties (Nighttime)	38	100	50	173
Level 4 (Killed)	1	3	1	6

Source: DOGAMI, Earthquake regional impact analysis for Clackamas, Multnomah, and Washington Counties, Oregon (2018, O-18-02), Tables 12-8, 12-9, 12-10, and 12-11.

Cascadia Subduction Zone Scenario

The City of Wilsonville is expected to have a 7% building loss ratio with a repair cost of \$291 million under the CSZ “dry” scenario, and an 10% building loss ratio with a repair cost of \$423 million under the CSZ “wet” scenario.⁹ The city is expected to have around 199 daytime or 38 nighttime casualties during the CSZ “dry” scenario and 315 daytime or 100 nighttime casualties during the CSZ “wet” scenario. It is expected that there will be a long-term displaced population of around 147 for the CSZ “dry” scenario and 894 for the CSZ “wet” scenario.¹⁰

Portland Hills Fault Scenario

The City of Wilsonville is expected to have a 9% building loss ratio with a repair cost of \$406 million under the CSZ “dry” scenario, and a 15% building loss ratio with a repair cost of \$681 million under the CSZ “wet” scenario.¹¹ The long-term displaced population and casualties are greatly increased for all the Portland Hills Fault scenarios. The city is expected to have around 255 daytime or 50 nighttime casualties during the Portland Hills Fault “dry” scenario and 505 daytime or 173 nighttime casualties during the Portland Hills Fault “wet” scenario. It is expected that there will be a long-term displaced population of around 181 for the Portland Hills Fault “dry” scenario and 1,616 for the Portland Hills Fault “wet” scenario.¹²

Recommendations from the report included topics within Planning, Recovery, Resiliency: Buildings, Resiliency: Infrastructure Improvements, Resiliency: Essential and Critical Facilities, Enhanced Emergency Management Tools, Database Improvements, Public Awareness, and Future Reports. The recommendations of this study are largely incorporated within this NHMPs mitigation strategies (Table WA-1 and Volume I, Section 3). For more detailed information on the report, the damage estimates, and the recommendations see: *Earthquake regional impact analysis for Clackamas, Multnomah, and Washington Counties, Oregon* (2018, [O-18-02](#)).

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

Flood

The HMAC determined that the City’s probability for flood is **moderate** and that their vulnerability to flood is **moderate**. *The probability rating decreased, and the vulnerability rating increased, since the previous version of this NHMP addendum.*

Volume I, Section 2 describes the characteristics of flood hazards, history, as well as the location, extent, and probability of a potential event. Figure WA-4 illustrates the flood hazard area for Wilsonville, which covers 390 acres including open water.

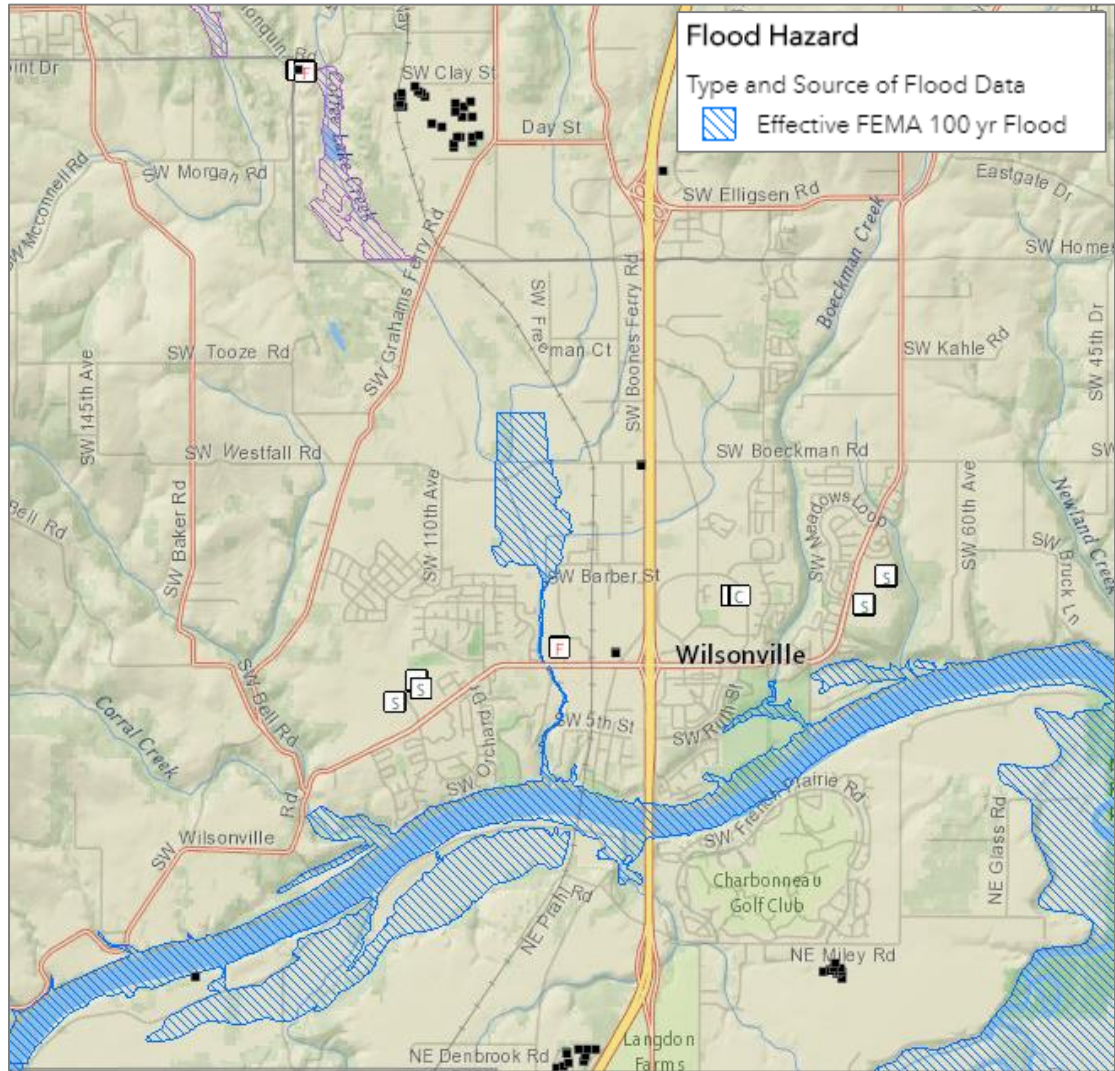
⁹ DOGAMI, *Earthquake regional impact analysis for Clackamas, Multnomah, and Washington Counties, Oregon* (2018, O-18-02), Tables 12-8 and 12-9.

¹⁰ Ibid, Tables 12-8 and 12-9.

¹¹ Ibid, Tables 12-10 and 12-11

¹² Ibid, Tables 12-10 and 12-11.

Figure WA-4 Special Flood Hazard Area



Source: [Oregon HazVu: Statewide Geohazards Viewer \(DOGAMI\)](#)

Note: To view detail click the link above to access Oregon HazVu

Portions of Wilsonville have areas of floodplain (special flood hazard areas, SFHA). These include the Willamette River, Coffee Creek, Basalt Creek, Boeckman Creek, Meridian Creek, Arrowhead Creek, Corral Creek, and South Tributary. The geographic location of the flooding hazard was determined using the designated FEMA 100-year floodplain data, as well as the inundation line for the 1996 flood. The flood hazard includes portions of Boeckman Road, a large area along Seely Ditch between the confluence of Basalt Creek, Coffee Creek, and South Tributary. Impacted community assets include one pump station, and fewer than five homes.

Vulnerability Assessment

Due to insufficient data and resources, Wilsonville is currently unable to perform a quantitative risk assessment for this hazard. Fortunately, most of the flood hazard is included in the Significant Resource Overlay Zone (SROZ), where development is prohibited. The SROZ includes 780 acres of land and has a 25-foot buffer zone where building applications and city staff work together to decide on the ultimate “no build” boundary for

the site. The SROZ map includes a few areas where the 1996 flood extended beyond the FEMA 100-year flood boundaries. These areas include portions of Corral Creek, spots in Memorial Park, and an area just west of Memorial Park.

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 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.

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 Wilsonville 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.

The largest flooding event to affect Wilsonville was the February 1996 flood. The high-water level meant tributaries could not drain into the Willamette River, which led to localized flooding on several backed-up creeks. Flooding also occurred at culverts and drainage choke points near Sun Place, Commerce Circle, and a pathway near Inza R. Wood Middle School. The La Quinta Hotel on Sun Place experienced a few inches of flooding to the first floor. The culverts that frequently cause flooding are owned and maintained by the Oregon Department of Transportation. The worst flooding occurred along the Willamette River. Portions of Memorial Park flooded but the sewer lift station was unaffected because Public Works sandbagged the facility and pumped out water for days. Three homes on Montgomery Way and Rose Lane were flooded; two homes had flooding in their living spaces and one home had storage space flooding.

The extent of flooding hazards in Wilsonville primarily depends on climate and precipitation levels. Additionally, withdrawals for irrigation and drinking water, as well as stream and wetland modifications or vegetation removal can influence water flow. In the past flooding has occurred along the Willamette River, in Coffee Creek Wetlands, and at choke points that can back up during heavy precipitation events. These problem areas include the backside of SW Commerce Circle, Sun Place (where a La Quinta hotel is located), a pathway at Inza R. Wood Middle School (which has resulted in the parking lot being flooded in the past), and Rose Lane, where the river can back up and come onto the road, causing traffic problems. For a list of facilities and infrastructure vulnerable to this hazard see the Community Assets section and Tables WA-5 through WA-10.

National Flood Insurance Program (NFIP)

FEMA's Flood Insurance Study (FIS), and Flood Insurance Rate Maps (FIRMs) are effective as of June 17, 2008. Table WA-13 shows that as of July 2018, Wilsonville has 35 National Flood Insurance Program (NFIP) policies in force. Of those, 12 are for properties that were constructed before the initial FIRMs. The last Community Assistance Visit (CAV) for Wilsonville was on January 14, 2009. Wilsonville does not participate in the Community Rating System (CRS). The table shows that the majority of flood insurance policies are for residential structures, primarily single-family homes. There has been a total of three (3) paid

claims for \$73,826. 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 Wilsonville identifies no Repetitive Loss Properties¹³ or Severe Repetitive Loss Properties¹⁴.

Table WA-13 Flood Insurance Detail

	Clackamas County	Wilsonville
Effective FIRM and FIS	6/17/2008	6/17/2008
Initial FIRM Date	-	1/6/1982
Total Policies	1,957	35
Pre-FIRM Policies	1,086	12
Policies by Building Type		
Single Family	1,761	34
2 to 4 Family	30	1
Other Residential	58	0
Non-Residential	9	0
Minus Rated A Zone	123	0
Insurance in Force	\$541,833,400	\$10,902,000
Total Paid Claims	590	3
Pre-FIRM Claims Paid	450	2
Substantial Damage Claims	83	0
Total Paid Amount	\$20,830,662	\$73,826
Repetitive Loss Structures	51	0
Severe Repetitive Loss Properties	4	0
CRS Class Rating	-	NP
Last Community Assistance Visit	-	1/14/2009

Source: Information compiled by Department of Land Conservation, and Development, July 2018.

Note: The portion of the cities of Portland and Tualatin that are within Clackamas County are not included in this table.

NP = Not Participating

Mitigation Activities

Wilsonville employs several mitigation strategies to reduce the city's risk to flood events. The city development code includes policies and regulations for flood prone areas including the Significant Resource Overlay Zone, Floodplain Regulations, Protection of Natural Features and Other Resources, and Willamette River Greenway. Development review practices and conditions of development require developers to account for 100% of

¹³ 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.

¹⁴ 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 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.

stormwater management onsite to reduce the risks of urban flooding in the future. Wilsonville regularly inspects and maintains the stormwater facilities. Enclosed pipe sections and catch basins are routinely cleaned and inspected using the combination truck, and a regular street sweeping program reduces the amount of debris and contaminants entering the stormwater system. The Stormwater Master Plan is currently being updated and several projects are underway to improve drainage. The Villebois development is creating a diversion to fix the flooding problem at Inza R. Wood Middle School. The sewer lift station in Memorial Park was relocated to avoid future flooding.

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

Landslide

The HMAC determined that the City's probability for landslide is **low** and that their vulnerability to landslide is **low**. *These ratings did not change since the previous version of this NHMP addendum.*

Volume I, Section 2 describes the characteristics of landslide hazards, history, as well as the location, extent, and probability of a potential event within the region. Wilsonville does not have a history of landslides. This is due to a primary and secondary open space ordinance in effect during the late 1970s. In the primary zone development was diverted from slopes greater than 20%, and in the secondary zone development was limited on slopes between 12% and 20%. This decades old ordinance has since been replaced by the Significant Resource Overlay Zone. Because of Wilsonville's progressive actions very little development has occurred on steep slopes.

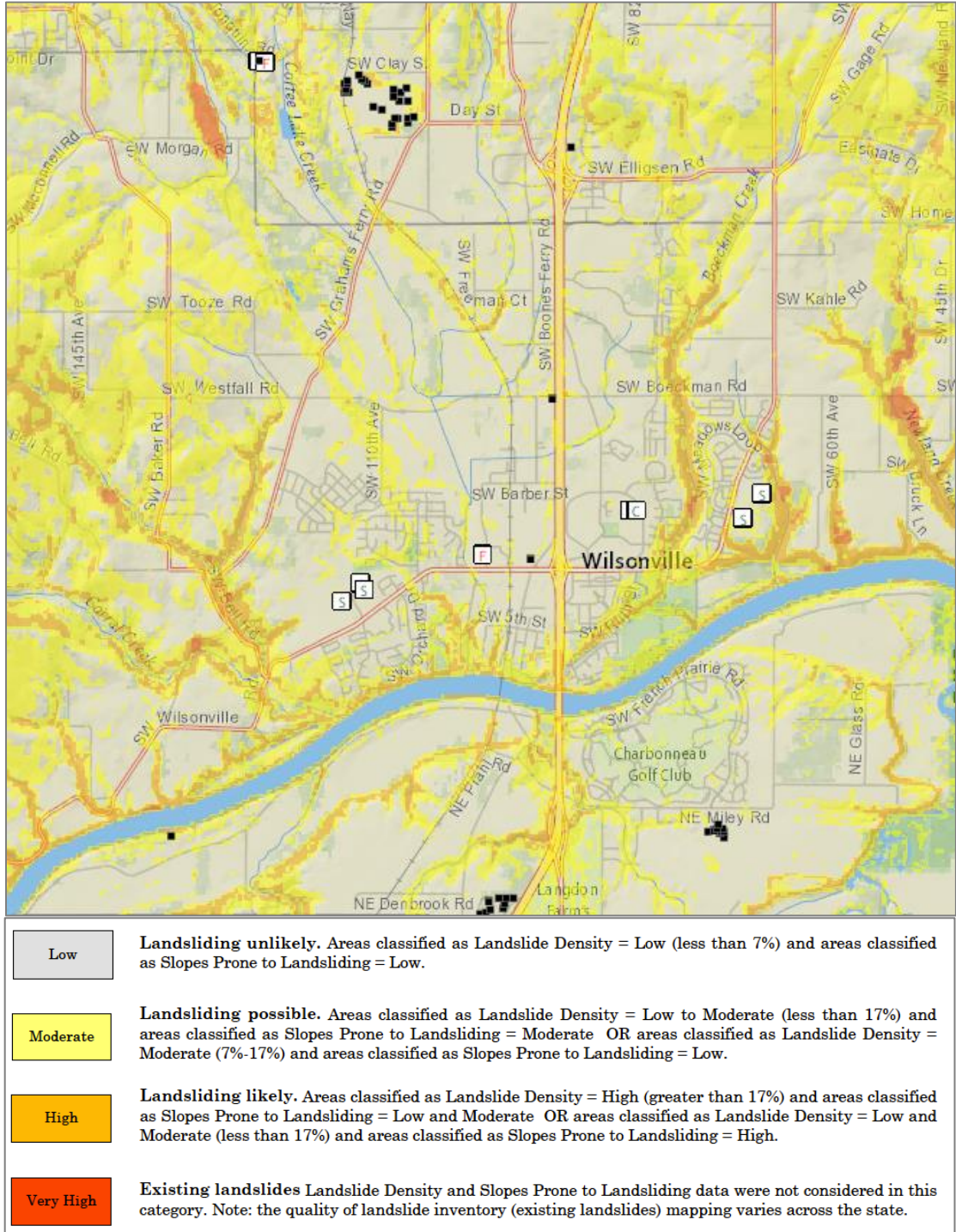
Although landslides have not occurred in Wilsonville, steep slopes do exist along the banks of the Willamette River. Four neighborhoods have been built near these slopes including Day Dream Ranch, Cedar Point, Edgewater, and Charbonneau. Canyon Creek Apartments are built on a moderate hill near the creek.

Landslide susceptibility exposure for Wilsonville is shown in Figure WA-5. Most of Wilsonville demonstrates a low to moderate landslide susceptibility exposure. Approximately 6% of Wilsonville has very high or high, and approximately 21% moderate, landslide susceptibility exposure.¹⁵

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

¹⁵ DOGAMI. [Open-File Report, O-16-02](#), *Landslide Susceptibility Overview Map of Oregon* (2016)

Figure WA-5 Landslide Susceptibility Exposure



Source: [Oregon HazVu: Statewide Geohazards Viewer \(DOGAMI\)](#)

Note: To view detail click the link above to access Oregon HazVu

Vulnerability Assessment

Due to insufficient data and resources, Wilsonville is currently unable to perform a quantitative risk assessment for this hazard. However, DOGAMI completed a statewide landslide susceptibility assessment in 2016 ([O-16-02](#)), general findings from that report are provided above and within Figure WA-5.

Potential landslide-related impacts are adequately described within Volume I, Section 2, and include infrastructure 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, and thoroughfares beyond City limits are susceptible to obstruction as well. For a list of facilities and infrastructure vulnerable to this hazard see the Community Assets section and Tables WA-5 through WA-10.

The most common type of landslides 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.

Mitigation Activities

Wilsonville works to mitigate future landslide hazards. The city development code includes several policies and regulations to protect slopes including the Significant Resource Overlay Zone, Protection of Natural Features and Other Resources, Landscaping, Screening and Buffering, and Willamette River Greenway. A tree detention program prohibits cutting down trees over 6" in diameter at breast height, which helps to stabilize soils. The city has a maintenance plan to ensure the storm water drains are regularly cleaned in the Cedar Ridge and Daydream Ranch neighborhoods. This plan was enacted after a home in the Portland West Hills (outside Wilsonville) slid in October 2008 because of improper drainage.

Wilsonville completed the Rivergreen Stormwater Outfall project which addressed runoff and groundwater seepage that caused significant erosion on the Willamette River bank. The city constructed a bioswale, rerouted stormwater discharges, and completed bank stabilization projects to prevent further erosion and stabilize areas of the bank that had been impacted by erosion.

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 hazard events. These events include extreme heat, windstorms, and winter storms. The following section describes the unique probability, and vulnerability of each identified weather hazard.

Extreme Heat

The HMAC determined that the City's probability for extreme heat events is **high** and that their vulnerability is **moderate**. *The probability rating increased, and the vulnerability rating did not change, since the previous version of this NHMP addendum.*

Volume I, Section 2 describes the characteristics of extreme heat, 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.

A severe heat episode or "heat wave" occurs about every two to three years, and typically lasting two to three days but can last as many as five days. A severe heat episode can be defined as consecutive days of upper 90s to around 100. Severe heat hazard in the Portland metro region can be described as the average number of days with temperatures greater than or equal to 90-degrees, or 100-degrees, Fahrenheit. On average the region experiences 13.6 days with temperatures above 90-degrees Fahrenheit, and 1.4 days above 100-degrees Fahrenheit, based on new 30-year climate averages (1981-2010) from the National Weather Service – Portland Weather Forecast Office.

The City of Wilsonville has not experienced any life-threatening consequences from the few historical extreme heat events, although changes in climate indicate that the area should expect to see more extreme heat events.

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

Windstorm

The HMAC determined that the City's probability for windstorm is **moderate** and that their vulnerability to windstorm is **low**. *The probability rating decreased, and the vulnerability rating did not change, since the previous version of this NHMP addendum.*

Volume I, Section 2 describes the characteristics of windstorm hazards, history, 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 flooding and winter storms (ice, freezing rain, and very rarely, snow). Other severe weather events that may accompany windstorms, including thunderstorms, hail, lightning strikes, and tornadoes are generally negligible for Wilsonville.

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 in turn may cause localized urban flooding.

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

Winter Storm (Snow/Ice)

The HMAC determined that the City's probability for winter storm is **moderate** and that their vulnerability to winter storm is **moderate**. *The probability rating decreased, and the vulnerability rating did not change, since the previous version of this NHMP addendum.*

Volume I, Section 2 describes the characteristics of winter storm hazards, history, 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.

The biggest impact of winter storms is congestion on roadways. Interstate 5 bisects Wilsonville into east and west sections. When I-5 backs up many of Wilsonville's transportation networks become congested. This is especially true if snow on I-5 is not plowed. Wilsonville has minimal construction on steep slopes but the Canyon Creek Apartment Complex has steep driveways which may be difficult to traverse in freezing weather.

Most winter storms 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 as noted above.

Vulnerability Assessment

Due to insufficient data and resources, Wilsonville is currently unable to perform a quantitative risk assessment, or exposure analysis, for the extreme heat, windstorm, and winter storm hazards. For a list of facilities and infrastructure vulnerable to these hazards see the Community Assets section and Tables WA-5 through WA-10.

Mitigation Activities

Mitigating severe weather can be difficult because storms affect all areas of the city, but Wilsonville has made progress to reduce the effects of storms. For over a decade Wilsonville has been recognized as a Tree City USA, and the city received a Tree City USA Growth Award for demonstrating progress in its community forestry program. These distinctions mean Wilsonville has an active tree care ordinance and public education pieces, among others, which help to maintain a healthy urban forest. Most utilities are underground and all new utilities are required to be undergrounded, but in case of power outages the city's critical facilities have back up power generation. Wilsonville also has a designated snow plow and sanding route to help expedite snow removal.

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

Volcanic Event

The HMAC determined that the City's probability for a volcanic event is **low** and that their vulnerability to a volcanic event is **low**. *The probability rating did not change, while the vulnerability decreased since the previous version of this NHMP addendum.*

Volume I, Section 2 describes the characteristics of volcanic hazards, history, as well as the location, extent, and probability of a potential event within the region. Generally, an event that affects the western portion of the County is likely to affect Wilsonville as well. Several volcanoes are located near Wilsonville, the closest of which are Mount Hood, Mount Adams, Mount Saint Helens, Mount Rainier, and the Three Sisters.

Vulnerability Assessment

Due to insufficient data and resources, Wilsonville is currently unable to perform a quantitative risk assessment, or exposure analysis, for this hazard. For a list of facilities and infrastructure vulnerable to this hazard see the Community Assets section and Tables WA-5 through WA-10.

Due to Wilsonville's relative distance from volcanoes, the city is unlikely to experience the immediate effects that eruptions have on surrounding areas (i.e., mud and debris flows, or lahars). Depending on wind patterns and which volcano erupts, however, the city may experience ashfall. The eruption of Mount St. Helens in 1980, for example, coated the Willamette Valley with a fine layer of ash. If Mount Hood erupts, however, the city could experience a heavier coating of ash.

Mitigation Activities

The existing volcano hazard mitigation activities are conducted at the county, regional, state, and federal levels and are described in the Clackamas County NHMP.

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

Wildfire

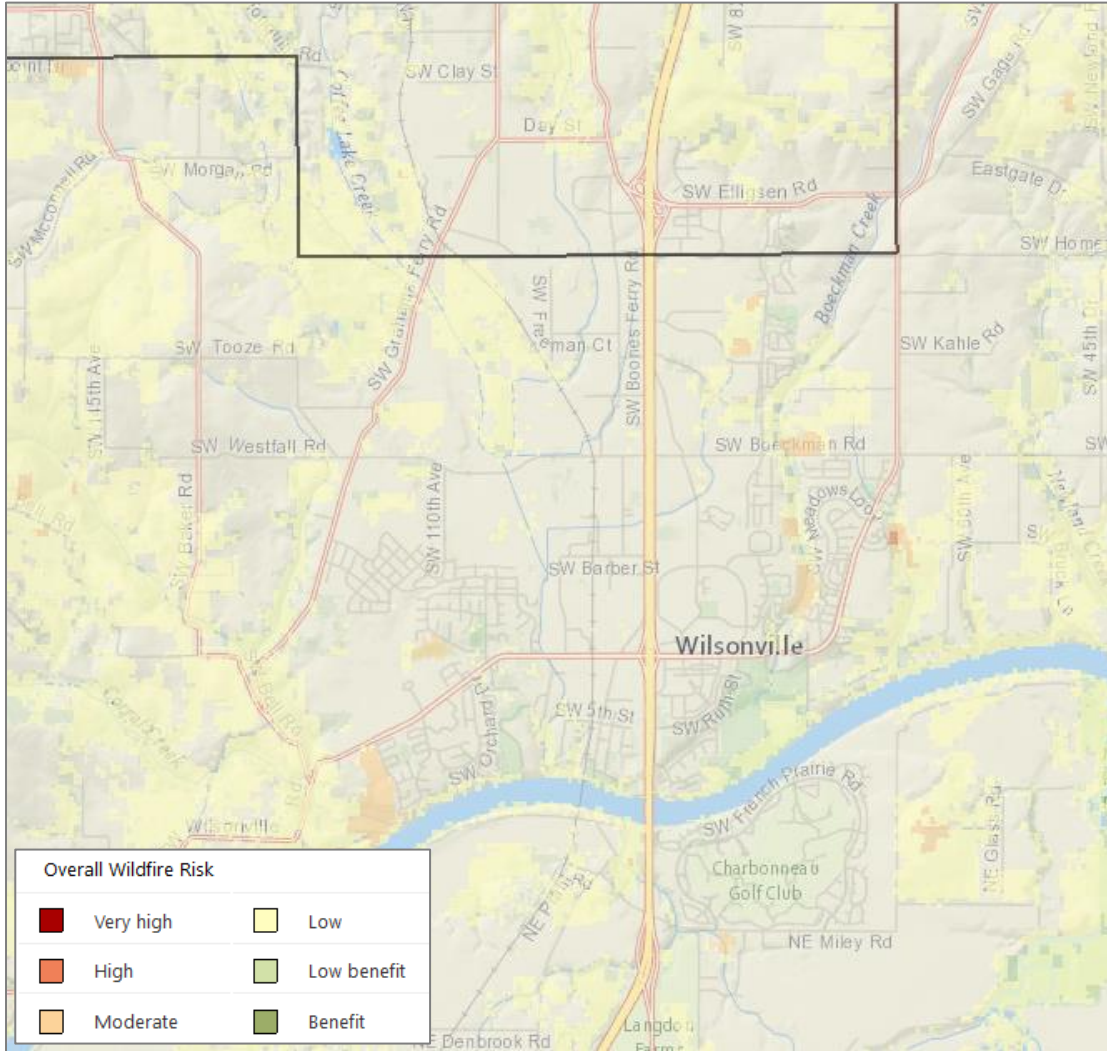
The HMAC determined that the City's probability for wildfire is **moderate**, and that their vulnerability to wildfire is **moderate**. *These ratings did not change since the previous version of this NHMP addendum.*

The [2017 Clackamas County Community Wildfire Protection Plan \(CWPP\)](#) was completed in May 2018. The CWPP is hereby incorporated into this NHMP addendum by reference, and it will serve as the wildfire section for this addendum. The following presents a summary of key information; refer to the full CWPP for a complete description, and evaluation of the wildfire hazard: <https://www.clackamas.us/dm/CWPP.html>. Information specific to Wilsonville is found in the following chapter: [Chapter 10.13: Tualatin Valley Fire and Rescue](#).

Volume I, Section 2 describes the characteristics of wildland fire hazards, history, 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. Wilsonville has not experienced a wildfire within City limits, but the city has abundant wooded areas that are a concern in the case of a wildfire event. Figure WA-6 shows overall wildfire risk in Wilsonville.

Clackamas County has two major physiographic regions: the Willamette River Valley in western Clackamas County and the Cascade Range Mountains in eastern and southern Clackamas County. The Willamette River Valley, which includes Wilsonville, is the most heavily populated portion of the county and is characterized by flat or gently hilly topography. The Cascade Range has a relatively small population and is characterized by heavily forested slopes. Eastern Clackamas County is at higher risk to wildfire than western portions of the county due to its dense forest land. Human caused fires are responsible for most fires in Clackamas County. In Wilsonville most instances of fire have been started by the railroads and I-5 but the fires have been small enough to contain quickly and easily.

Figure WA-6 Overall Wildfire Risk



Source: [Oregon Wildfire Risk Explorer](#), date accessed November 9, 2018.

The forested hills within, and surrounding Wilsonville are interface areas including the Beckman Creek Corridor, Xerox Woods, Burnerts Orchard, the Living Enrichment Center (LEC), Metro Graham Oaks Nature Park, the area north of Elligsen Road near fire station 56, and the area east of Wilsonville High School, where access would be a problem. High and Medium Priority Communities at Risk (CARs) within the City include: Graham Oaks Nature Park (part of Ladd Hill CAR) and Boeckman Creek.¹⁶

Most of the city has less severe (moderate or less) wildfire burn probability that includes expected flame lengths less than four-feet under normal weather conditions.¹⁷ However, conditions vary widely and with local topography, fuels, and local weather (including wind) conditions. Under warm, dry, windy, and drought conditions expect higher likelihood of fire

¹⁶ Clackamas County Community Wildfire Protection Plan, *Wilsonville Fire Department* (2018), Table 10.13-1.

¹⁷ [Oregon Wildfire Risk Explorer](#), date accessed November 9, 2018.

starts, higher intensity, more ember activity, and a more difficult to control wildfire that will include more fire effects and impacts.

Vulnerability Assessment

Due to insufficient data and resources, Wilsonville is currently unable to perform a quantitative risk assessment, or exposure analysis, for this hazard. For a list of facilities and infrastructure vulnerable to this hazard see the Community Assets section and Tables WA-5 through WA-10.

The potential community impacts, and vulnerabilities described in Volume I, Section 2 are generally accurate for the City as well. Wilsonville's fire response is addressed within the CWPP which assesses wildfire risk, maps wildland urban interface areas, and includes actions to mitigate wildfire risk. The City will update the City's wildfire risk assessment if the fire plan presents better data during future updates (an action item is included to participate in future updates to the CWPP).

Property can be damaged or destroyed with one fire as structures, vegetation, and other flammables easily merge to become unpredictable, and hard to manage. Other factors that affect 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).

Mitigation Activities

Wilsonville uses several mitigation tools to reduce the city's risk to wildfires. The city enforces open lots to cut grasses before July 4th. If the property owner does not cut the grass the city will do it. The Significant Resources Overlay Zone has prohibited development in many of the densely forested areas. Tualatin Valley Fire & Rescue adopted a district-wide wildland map that governs new construction, and an active public education program for high risk-wildfire areas.

Please review the [2017 Clackamas County Community Wildfire Protection Plan \(CWPP\)](#) and Volume I, Section 2 for additional information on this hazard.

ATTACHMENT A: ACTION ITEM FORMS

ACTION ITEM FORMS

Multi-Hazard #1*	45
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Wildfire #1*	56

* - Priority Action Item

Note: The HMAC decided to modify the prioritization of action items in this update to reflect current conditions (risk assessment), needs, and capacity.

Summary of Action Changes

Below is a list of changes to the action items since the previous plan.

Previous NHMP Actions: Completed

Earthquake Action #2 (2012): “Seismically retrofit Elligsen Road Fire Station and associated structures” is considered complete. A \$77.5 million bond measure (34-133) was passed in 2006 by southeast Portland metro-area voters to correct seismic safety deficiencies at Tualatin Valley Fire and Rescue Fire Station 52 and to replace Fire Station 56. In addition, Earthquake Action #1 (2012) was updated in this version of the addendum to reflect the completion of seismic work to City Hall and water treatment plant; the public works/police station is funded for retrofit through the Oregon Seismic Rehabilitation Grant Program (see EQ #1 for more information).

See 2018 status identified in each action for activities that have been completed since the previous plan.

Previous NHMP Actions: Removed

Multi-Hazard Action #3 (2012): “Identify and pursue funding opportunities to develop and implement hazard mitigation activities” was removed from the list since it was determined by the steering committee that this is a function of their Implementation and Maintenance Plan and did not need to be included as an action.

Multi-Hazard Action #4 (2012): “Continue to update and improve hazard assessments in the Natural Hazards Mitigation Plan as new information becomes available” was removed from

the list since it was determined by the steering committee that this is a function of their Implementation and Maintenance Plan and did not need to be included as an action.

Note: 2012 Actions MH #5 and EQ #3 were renumbered to 2019 Actions MH #3 and EQ #2 respectively.

New NHMP Actions (2019):

- Earthquake Action #3
- Earthquake Action #4
- Wildfire Action #1

See action item forms below for detail.

Action Item Forms

Each action item has a corresponding action item worksheet describing the activity, identifying the rationale for the project, identifying potential ideas for implementation, and assigning coordinating and partner organizations. The action item worksheets can assist the community in pre-packaging potential projects for grant funding. The worksheet components are described below.

ALIGNMENT WITH EXISTING PLANS/POLICIES

The Clackamas County NHMP includes a range of action items that, when implemented, will reduce loss from hazard events in the County, participating cities, and special districts. Within the plan, FEMA requires the identification of existing programs that might be used to implement these action items. The City addresses statewide planning goals and legislative requirements through its comprehensive land use plan, capital improvements plan, mandated standards and building codes. To the extent possible, the City will work to incorporate the recommended mitigation action items into existing programs and procedures. Each action item identifies related existing plans and policies.

STATUS/RATIONALE FOR PROPOSED ACTION ITEM

Action items should be fact-based and tied directly to issues or needs identified throughout the planning process. Action items can be developed at any time during the planning process and can come from several sources, including participants in the planning process, noted deficiencies in local capability, or issues identified through the risk assessment. The rationale for proposed action items is based on the information documented in Section 2. The worksheet provides information on the activities that have occurred since the previous plan for each action item.

IDEAS FOR IMPLEMENTATION

The ideas for implementation offer a transition from theory to practice and serve as a starting point for this plan. This component of the action item is dynamic, since some ideas may prove to not be feasible, and new ideas may be added during the plan maintenance process. Ideas for implementation include such things as collaboration with relevant organizations, grant programs, tax incentives, human resources, education and outreach, research, and physical manipulation of buildings and infrastructure.

COORDINATING (LEAD) ORGANIZATION:

The coordinating organization is the public agency with the regulatory responsibility to address natural hazards, or that is willing and able to organize resources, find appropriate funding, or oversee activity implementation, monitoring and evaluation.

INTERNAL AND EXTERNAL PARTNERS:

The internal and external partner organizations listed in the Action Item Worksheets are potential partners recommended by the project HMAP but not necessarily contacted during the development of the plan. The coordinating organization should contact the identified partner organizations to see if they are capable of and interested in participation. This initial contact is also to gain a commitment of time and/or resources toward completion of the action items.

Internal partner organizations are departments within the City or other participating jurisdiction that may be able to assist in the implementation of action items by providing relevant resources to the coordinating organization.

External partner organizations can assist the coordinating organization in implementing the action items in various functions and may include local, regional, state, or federal agencies, as well as local and regional public and private sector organizations.

PLAN GOALS ADDRESSED:

The plan goals addressed by each action item are identified as a means for monitoring and evaluating how well the mitigation plan is achieving its goals, following implementation.

TIMELINE:

All broad scale action items have been determined to be ongoing, as opposed to short-term (0 to 2 years) or long-term (3 or more years). This is because the action items are broad ideas, and although actions may be implemented to address the broad ideas, the efforts should be ongoing.

POTENTIAL FUNDING SOURCE

Where possible potential funding sources have been identified. Example funding sources may include: Federal Hazard Mitigation Assistance programs, state funding sources such as the Oregon Seismic Rehabilitation Grant Program, or local funding sources such as capital improvement or general funds. An action item may include several potential funding sources.

ESTIMATED COST

A rough estimate of the cost for implementing each action item is included. Costs are shown in general categories showing low, medium, or high cost. The estimated cost for each category is outlined below:

- Low - Less than \$50,000
- Medium - \$50,000 – \$100,000
- High - More than \$100,000

Multi-Hazard #1*

Proposed Action Item		Alignment with Plan Goals:	
Develop public education programs to inform the public about methods for mitigating the impacts of natural hazards.		Protect Life and Property; Augment Emergency Services; Encourage Partnerships for Implementation; Promote Public Awareness	
Alignment with Existing Plans/Policies:			
2018 Status/Rationale for Proposed Action Item:			
<ul style="list-style-type: none"> Conducting public outreach campaigns raises awareness about natural hazards and helps illustrate what residents and businesses can do to reduce the impact of a natural disaster on their properties, thereby significantly reducing the impact of natural hazards on the City of Wilsonville. The Disaster Mitigation Act of 2000 requires that communities continue to involve the public beyond the original planning process [201.6(c)(4)(ii)]. Developing public education programs for hazard risk mitigation would be a way to keep the public informed of, and involved in, the county's actions to mitigate hazards. <u>2018 Status:</u> The City utilizes the city's website to provide information on natural hazards: https://www.ci.wilsonville.or.us/publicworks/page/emergency-management 			
Ideas for Implementation:			
<ul style="list-style-type: none"> Conduct public education as hazard seasons approach. These include earthquake awareness month in April, wildfire prevention in summer, and flood and severe storm information in winter; Identify property owners in flood, landslide, and wildfire hazard zones, and conduct a target mailing to disseminate information on all hazards; Partner with Clackamas County and other jurisdictions to develop public education flyers for all hazards; Include insurance information in public outreach and education materials and promote purchase of appropriate insurance coverage; Include hazard information on the city website and link to the Tualatin Valley Fire & Rescue safety tips website; and Utilize the city newsletter, The Boones Ferry Messenger, to disseminate hazard information 			
Coordinating Organization:		Planning	
Internal Partners:		External Partners:	
Tualatin Valley Fire & Rescue, Hazard Mitigation Advisory Committee		Neighborhood Associations, Wilsonville Chamber of Commerce, Clackamas County, Oregon Partnership for Disaster Resilience	
Potential Funding Sources:		Estimated cost:	Timeline:
General Fund		Low	<input type="checkbox"/> Short Term (0-2 years) <input type="checkbox"/> Long Term (2-4+ years) <input checked="" type="checkbox"/> Ongoing
Form Submitted by:	Existing action item		
Priority:	High		

* - High Priority Action Item

Multi-Hazard #2

Proposed Action Item:		Alignment with Plan Goals:	
Integrate the goals and action items from the Natural Hazards Mitigation Plan into existing regulatory documents and programs, where appropriate.		Protect Life and Property; Enhance Natural Systems; Augment Emergency Services; Encourage Partnerships for Implementation; Promote Public Awareness	
Alignment with Existing Plans/Policies:			
Comprehensive Plan, Zoning Ordinance			
2018 Status/Rationale for Proposed Action Item:			
<ul style="list-style-type: none"> The Disaster Mitigation Act of 2000 requires communities to identify actions and projects that reduce the effects of hazards on the community [201.6(c)(3)(ii)]. Incorporating natural hazards plans into comprehensive plans, local ordinances, and land-use regulations will ensure that communities implement the proper mitigation measures for their community. <u>2018 Status:</u> The City updated their development code in 2015. The floodplain ordinance was last updated in 2010 (Ordinance 686, 11/1/10). The City updated their comprehensive plan in July 2013. 			
Ideas for Implementation:			
<ul style="list-style-type: none"> Use the mitigation plan to help the City's Comprehensive Land Use Plan meet State Land Use Planning Goal 7, designed to protect life and property from natural disasters and hazards through planning strategies that restrict development in areas of known hazards; Integrate the city's mitigation actions into the current capital improvement plans to ensure development does not encroach on known hazard areas; Incorporate the Natural Hazards Mitigation Plan into City Code where appropriate; and Use the natural hazard mitigation planning resources provided by the Oregon Partnership for Disaster Resilience to learn how to better integrate the NHMP into existing documents and programs. 			
Coordinating Organization:		Planning	
Internal Partners:		External Partners:	
Public Works, Building, Planning Commission, Natural Resources		Department of Land Conservation and Development, Department of Geology and Mineral Industries, Oregon Department of Transportation, Department of Environmental Quality	
Potential Funding Sources:		Estimated cost:	Timeline:
General Fund, DLCDC Technical Assistance Grant		Low	<input type="checkbox"/> Short Term (0-2 years) <input type="checkbox"/> Long Term (2-4+ years) <input checked="" type="checkbox"/> Ongoing
Form Submitted by:	Existing action item		
Priority:	Medium		

Multi-Hazard #3

Proposed Action Item:		Alignment with Plan Goals:	
Continue vegetation management throughout the city.		Augment Emergency Services; Promote Public Awareness	
Alignment with Existing Plans/Policies:			
2018 Status/Rationale for Proposed Action Item:			
<ul style="list-style-type: none"> Landscaping and vegetation make a difference in mitigating the impacts of natural hazards. Trees break the force of the wind and stabilize the soil. Wetlands absorb much of the overflow from stream channels. Fire-resistant vegetation can retard the spread of wildfires toward vulnerable buildings. Limiting or regulating the amount of vegetation cleared off a hillside lot reduces the risk of increasing the number of landslide-prone areas in a community. Planting vegetation or maintaining slope terraces can also reduce slope-runoff. Planners can use landscaping requirements to preserve or enhance the protection such natural features afford. These requirements may be part of site plan reviews or a separate set of zoning regulations and environmental performance standards. <u>2018 Status:</u> Ongoing activity of city. 			
Ideas for Implementation:			
<ul style="list-style-type: none"> Partner with Clackamas County, Oregon Department of Transportation (ODOT), railroad companies, Oregon Department of Forestry (ODF), US Forestry Service (USFS), and citizens to control vegetation along transportation corridors; Identify appropriate practices for eliminating invasive species such as blackberry and English Ivy; Maintain healthy urban canopy and remove excess understory; Maintain vegetation coverage for slope stability; Identify hazardous trees for remediation or removal; Review and update existing ordinances to incorporate and improve vegetation management on private property; Develop mechanism to review vegetation on a case by case basis; Provide education to the public about justifications for, and benefits of vegetation mitigation practices; and Encourage fuels reduction on private property by providing education for pruning, safe tree removal and native vegetation use; Continue to update the Significant Resource Overlay Zone (SROZ); and Continue to enforce the noxious vegetation code. 			
Coordinating Organization:		Natural Resources	
Internal Partners:		External Partners:	
Planning, Public Works, Parks		Clackamas County, railroad companies, ODOT, ODF, PGE, USFS	
Potential Funding Sources:		Estimated cost:	Timeline:
General Fund		Low	<input type="checkbox"/> Short Term (0-2 years) <input type="checkbox"/> Long Term (2-4+ years) <input checked="" type="checkbox"/> Ongoing
Form Submitted by:	Existing action item		
Priority:	Medium		

Earthquake #1

Proposed Action Item:		Alignment with Plan Goals:	
Conduct seismic evaluations of the Community Center and other critical and essential facilities and implement appropriate structural mitigation strategies.		Protect Life and Property; Enhance Natural Systems; Augment Emergency Services	
Alignment with Existing Plans/Policies:			
2018 Status/Rationale for Proposed Action Item:			
<ul style="list-style-type: none"> • The Wastewater Treatment Plant, Community Center, and Public Works/Police Building are not up to seismic standards; • 2018/2019 Public Works/Police Building is undergoing seismic rehabilitation; and • Pre-disaster mitigation strategies will reduce post-disaster response needs by lessening life loss, injury, damage, and disruption. • <u>2018 Status</u>: Seismic study on the Charbonneau reservoir was completed in April 2012. Other critical facilities are built to life safety standards (but not to operational standards). Wastewater Treatment Plant was updated in 2014. Public Works/Police Station is currently being seismically retrofitted (per Phase Two of the 2015-2017 Seismic Rehabilitation Grant Program). 			
Ideas for Implementation:			
<ul style="list-style-type: none"> • Obtain funding to perform evaluations; • Prioritize seismic upgrades based on criticality of need and population served; • Partner with appropriate organizations to implement seismic upgrades; and • Seismically retrofit these facilities to guarantee continuous operation during and after a natural disaster. 			
Coordinating Organization:		Community Development and Public Works	
Internal Partners:		External Partners:	
Building, Engineering		Wilsonville Police, DOGAMI	
Potential Funding Sources:		Estimated cost:	Timeline:
General Fund, Seismic Rehabilitation Grant Program, Hazard Mitigation Assistance Grants		Moderate to High	<input type="checkbox"/> Short Term (0-2 years) <input checked="" type="checkbox"/> Long Term (2-4+ years) <input type="checkbox"/> Ongoing
Form Submitted by:	Existing action item		
Priority:	Medium		

Earthquake #2

Proposed Action Item:		Alignment with Plan Goals:	
Perform non-structural mitigation on public facilities to improve life safety standards.		Protect Life and Property; Augment Emergency Services; Promote Public Awareness	
Alignment with Existing Plans/Policies:			
2018 Status/Rationale for Proposed Action Item:			
<ul style="list-style-type: none"> The Disaster Mitigation Act of 2000 requires communities to identify actions and projects that reduce the effects of hazards on the community, particularly to buildings and infrastructure [201.6(c)(3)(ii)]. Implementing non-structural mitigation programs will reduce the potential for life loss in public buildings and assist a community in reducing its overall earthquake risk. <u>2018 Status</u>: The City provides non-structural mitigation public outreach and education regularly, including drills and training. 			
Ideas for Implementation:			
<ul style="list-style-type: none"> Provide information to government building and school facility managers and teachers on nonstructural mitigation techniques including: securing bookcases, filing cabinets, light fixtures, and other objects that can cause injuries and block exits; and Encourage facility managers, business owners, and teachers to refer to FEMA's practical guidebook: Reducing the Risks of Nonstructural Earthquake Damage; 			
Coordinating Organization:		Human Resources	
Internal Partners:		External Partners:	
Building, Engineering		TVF&R, Oregon Occupational Safety and Health Administration	
Potential Funding Sources:		Estimated cost:	Timeline:
General Fund, Seismic Rehabilitation Grant Program		Low to Moderate	<input type="checkbox"/> Short Term (0-2 years) <input type="checkbox"/> Long Term (2-4+ years) <input checked="" type="checkbox"/> Ongoing
Form Submitted by:	Existing action item		
Priority:	Medium		

Earthquake #3*

Proposed Action Item		Alignment with Plan Goals:	
Seismically retrofit Willamette Water Treatment Plant and Intake Facility		Protect Life and Property; Augment Emergency Services	
Alignment with Existing Plans/Policies:			
Willamette River Water Treatment Plant 2017 Master Plan Update			
2018 Status/Rationale for Proposed Action Item:			
<ul style="list-style-type: none"> • The Water Treatment Plant was built in 2002, but is not built to current seismic standards; • Changes in the seismic design criteria since the WRWTP was constructed in 2002. Given the changes in the USGS data between 2002 and 2008, projected ground accelerations in the region have increased up to 28percent, significantly adding to the structural design requirements; • The preliminary structural analysis identified both structural and non-structural vulnerabilities that may affect plant performance in a regional catastrophic seismic event. This 2017 MPU recommends including seismic retrofits to minimize infrastructure downtime and ensure plant performance after a catastrophic event; • The preliminary life-safety analysis identified issues about building code compliance and structural improvements. This 2017 MPU recommends modifications to support worker safety after a catastrophic seismic event; and • Pre-disaster mitigation strategies will reduce post-disaster response needs by lessening life loss, injury, damage, and disruption. 			
Ideas for Implementation:			
<ul style="list-style-type: none"> • Gain funding to retrofit/replace Willamette Water Treatment Plant and Intake Facility; and • Partner with appropriate organizations to implement seismic upgrades; and • Seismically retrofit this facility to guarantee continuous operation during and after a natural disaster. 			
Coordinating Organization:		Engineering	
Internal Partners:		External Partners:	
Building		Infrastructure Finance Authority	
Potential Funding Sources:		Estimated cost:	Timeline:
Rate Payers, SRGP, HMA (PDM, HMGP), General Fund		High (\$1,160,000)	<input type="checkbox"/> Short Term (0-2 years) <input checked="" type="checkbox"/> Long Term (2-4+ years) <input type="checkbox"/> Ongoing
Form Submitted by:	New Action Item (2018)		
Priority:	High		

* - High Priority Action Item

Earthquake #4

Proposed Action Item:		Alignment with Plan Goals:	
Construct the French Prairie Bridge, including accommodation of emergency vehicle passage.		Protect Life and Property; Augment Emergency Services; Encourage Partnerships for Implementation;	
Alignment with Existing Plans/Policies:			
Bike Ped Master Plan, Parks and Rec Master Plan, Transportation System Plan, Ice Age Tonquin Trail Master Plan, Wilsonville Tourism Development Strategy			
2018 Status/Rationale for Proposed Action Item:			
<ul style="list-style-type: none"> • The French Prairie Bridge would fill a critical gap in local and regional multi-modal transportation infrastructure, connecting the Portland metro area and the northern portion of the Willamette Valley, known as the French Prairie region; • Provide an alternate, seismically resilient route; to access either side of the Willamette River when I-5 is impeded post-earthquake, hazardous spill, traffic accident, etc.); and • Pre-disaster mitigation strategies will reduce post-disaster response needs by lessening life loss, injury, damage, and disruption • <u>2018 Status:</u> In the process of planning and developing preliminary designs for a proposed bicycle/pedestrian/emergency-access bridge across the Willamette River. A new bridge would be built near the historic Boones Ferry location, between the I-5 Boone Bridge and the railroad bridge to the west. http://frenchprairiebridgeproject.org/ 			
Ideas for Implementation:			
<ul style="list-style-type: none"> • Gain funding to retrofit/replace French Prairie Bridge; and • Partner with appropriate organizations to implement seismic upgrades; and • Seismically retrofit this facility to guarantee continuous operation during and after a natural disaster. 			
Coordinating Organization:		Engineering	
Internal Partners:		External Partners:	
Building		ODOT, Metro, Clackamas County	
Potential Funding Sources:		Estimated cost:	Timeline:
General Fund, Seismic Rehabilitation Grant Program, Hazard Mitigation Assistance Grants		High	<input type="checkbox"/> Short Term (0-2 years) <input checked="" type="checkbox"/> Long Term (2-4+ years) <input type="checkbox"/> Ongoing
Form Submitted by:	New action item		
Priority:	Medium		

Flood #1

Proposed Action Item:		Alignment with Plan Goals:	
Ensure continued compliance in the National Flood Insurance Program (NFIP) through enforcement of local floodplain management ordinances.		Protect Life and Property; Encourage Partnerships for Implementation	
Alignment with Existing Plans/Policies:			
Flood Ordinance; Zoning Code			
2018 Status/Rationale for Proposed Action Item:			
<ul style="list-style-type: none"> The National Flood Insurance Program provides communities with federally backed flood insurance to homeowners, renters, and business owners, if communities develop and enforce adequate floodplain management ordinances. The benefits of adopting NFIP standards for communities are a reduced level of flood damage in the community and stronger buildings that can withstand floods. According to the NFIP, buildings constructed in compliance with NFIP building standards suffer approximately 80 percent less damage annually than those not built in compliance. The Disaster Mitigation Act of 2000 requires communities to identify mitigation actions that address new and existing buildings and infrastructure [201.6(c)(3)(ii)]. Continued participation in the NFIP will help reduce the level of flood damage to new and existing buildings in communities while providing homeowners, renters and business owners additional flood insurance protection. <u>2018 Status:</u> Ongoing activity of city. Flood ordinance is current. See Flood section for more information. 			
Ideas for Implementation:			
<ul style="list-style-type: none"> Community Assistance Visits (CAV) are scheduled visits to communities participating in the NFIP for the purpose of: 1) conducting a comprehensive assessment of the community's floodplain management program; 2) assisting the community and its staff in understanding the NFIP and its requirements; and 3) assisting the community in implementing effective flood loss reduction measures when program deficiencies or violations are discovered. Actively participate with DLCD and FEMA during Community Assistance Visits. Assess the floodplain ordinances to ensure they reflect current flood hazards and situations and meet NFIP requirements. Coordinate with the county to ensure that floodplain ordinances and NFIP regulations are maintained and enforced. Mitigate areas that are prone to flooding and/or have the potential to flood. These areas include SW Commerce Circle, Sun Place, Rose Lane, and the pathway/parking lot at Inza R. Wood Middle School, Montgomery Way, and Memorial Park. 			
Coordinating Organization:		Community Development	
Internal Partners:		External Partners:	
Planning, GIS		Department of Land Conservation and Development; Association of State Floodplain Managers	
Potential Funding Sources:		Estimated cost:	Timeline:
General Fund		Low	<input type="checkbox"/> Short Term (0-2 years) <input type="checkbox"/> Long Term (2-4+ years) <input checked="" type="checkbox"/> Ongoing
Form Submitted by:	Existing Action Item		
Priority:	Medium		

Flood #2

Proposed Action Item:		Alignment with Plan Goals:	
Coordinate with the Oregon Department of Transportation (ODOT) to increase the capacity of culverts.		Protect Life and Property; Encourage Partnerships for Implementation	
Alignment with Existing Plans/Policies:			
2018 Status/Rationale for Proposed Action Item:			
<ul style="list-style-type: none"> In 2008, flooding occurred at culverts and drainage choke points near Sun Place, Commerce Circle, and a pathway near Inza R. Wood Middle School. In the past flooding has occurred along the Willamette River, in Coffee Creek Wetlands, and at choke points that can back up during heavy precipitation events. These problem areas include the backside of SW Commerce Circle, Sun Place (where a La Quinta hotel is located), a pathway at Inza R. Wood Middle School (which has resulted in the parking lot being flooded in the past), and Rose Lane, where the river can back up and come onto the road, causing traffic problems. <u>2018 Status</u>: culvert projects occur annually. 			
Ideas for Implementation:			
<ul style="list-style-type: none"> Develop an Intergovernmental Agreement with ODOT Identify undersized culverts and propose mitigation action; Work with business owners to discuss flooding problems; Prioritize construction projects based on criticality of need; and Coordinate with ODOT for funding opportunities. 			
Coordinating Organization:		Community Development	
Internal Partners:		External Partners:	
Engineering, Public Works		ODOT, Business community, METRO, Clackamas County, Washington County	
Potential Funding Sources:		Estimated cost:	Timeline:
General Fund, ODOT resources		Medium to High	<input type="checkbox"/> Short Term (0-2 years) <input type="checkbox"/> Long Term (2-4+ years) <input checked="" type="checkbox"/> Ongoing
Form Submitted by:	Existing Action Item		
Priority:	Medium		

Flood #3*

Proposed Action Item:		Alignment with Plan Goals:	
Implement the recommendations found in the Stormwater Master Plan.		Protect Life and Property; Enhance Natural Systems; Augment Emergency Services; Encourage Partnerships for Implementation	
Alignment with Existing Plans/Policies:			
Stormwater Master Plan			
2018 Status/Rationale for Proposed Action Item:			
<ul style="list-style-type: none"> • The stormwater master plan developed Capital Improvement Projects to address deficiencies in the stormwater system; • The stormwater master plan promotes proper watershed management; and • Stormwater management is a key element in maintaining and enhancing a community's livability. There is a direct link between stormwater and a community's surface and ground waters. Protecting these waters is vital for a great number of uses, including fish and wildlife habitat, recreation, and drinking water. • <u>2018 Status:</u> Stormwater Master Plan was updated in 2012. Capital improvement projects occur annually. 			
Ideas for Implementation: CWPP Identified Focus Areas and Priority Actions			
<ul style="list-style-type: none"> • Identify funding sources to implement recommendations. 			
Coordinating Organization:		Natural Resources	
Internal Partners:		External Partners:	
Planning, Public Works		Clackamas County Water Environment Services, METRO, Department of Environmental Quality, Department of Land Conservation and Development, Department of State Lands	
Potential Funding Sources:		Estimated cost:	Timeline:
ODF, operating budgets		Low to High	<input type="checkbox"/> Short Term (0-2 years) <input type="checkbox"/> Long Term (2-4+ years) <input checked="" type="checkbox"/> Ongoing
Form Submitted by:	Existing Action Item		
Priority:	High		

Severe Weather #1

Proposed Action Item:		Alignment with Plan Goals:	
Reduce negative effects from severe windstorm and severe winter storm events.		Protect Life and Property; Enhance Natural Systems; Augment Emergency Services; Encourage Partnerships & Implementation; Promote Public Awareness	
Alignment with Existing Plans/Policies:			
2018 Status/Rationale for Proposed Action Item:			
<ul style="list-style-type: none"> The Disaster Mitigation Act of 2000 requires communities to identify and analyze a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with emphasis on new and existing buildings and infrastructure [201.6(c)(3)(ii)]. Developing and implementing programs to reduce the potential for wind and winter storms to cause power outages can assist a community in mitigating its overall risk to wind and winter storms. <u>2018 Status</u>: Ongoing activity of city. 			
Ideas for Implementation:			
<ul style="list-style-type: none"> Encourage burial of power lines for existing development; Ensure that there are back up underground lines to major businesses & employers; Develop partnerships to implement programs to keep trees from threatening lives, property, and public infrastructure; and Continue regular tree trimming practices (City focus in right-of-way; private property owners and utility companies take care of trees on their property). 			
Coordinating Organization:		Community Development	
Internal Partners:		External Partners:	
Public Works		PGE, Bonneville Power Administration, private landowners	
Potential Funding Sources:		Estimated cost:	Timeline:
Capital Funds		Low to High	<input type="checkbox"/> Short Term (0-2 years) <input type="checkbox"/> Long Term (2-4+ years) <input checked="" type="checkbox"/> Ongoing
Form Submitted by:	Existing Action Item		
Priority:	Medium		

Wildfire #1*

Proposed Action Item:		Alignment with Plan Goals:	
Coordinate wildfire mitigation action items through the Clackamas County Community Wildfire Protection Plan .		Protect Life and Property; Enhance Natural Systems; Augment Emergency Services; Encourage Partnerships & Implementation; Promote Public Awareness	
Alignment with Existing Plans/Policies:			
Clackamas County Community Wildfire Protection Plan (2018)			
2018 Status/Rationale for Proposed Action Item:			
The wildfire mitigation action items provide direction on specific activities that organizations and residents in Wilsonville can take to reduce wildfire hazards.			
Ideas for Implementation: CWPP Identified Focus Areas and Priority Actions			
<u>Wildfire Risk Assessment (Ch. 4):</u>			
<ol style="list-style-type: none"> Maintain and update the Fuels Reduction (FR) and Communities at Risk (CAR) maps and databases. Continue to track structure vulnerability data throughout the County through structural triage assessments. Update the Overall Wildfire Risk Assessment as new data becomes available. 			
<u>Hazardous Fuels Reduction and Biomass Utilization (Ch. 5):</u>			
<ol style="list-style-type: none"> Develop and maintain an inventory of potential and successful FR projects by meeting with parks and natural lands managers quarterly. Continue securing funding to implement projects/hire seasonal ODF staff. 			
<u>Emergency Operations (Ch. 6):</u>			
<ol style="list-style-type: none"> Develop and FDB Communications Works Group. Conduct a Conflagration Exercise. 			
<u>Education and Community Outreach (Ch. 7):</u>			
<ol style="list-style-type: none"> Develop Firewise toolkit for CAR's. Create incentives for fuels reduction. Update and distribute the Burn Permitting and Fire Restrictions Brochure. Continue to improve address signage throughout the County. 			
<u>Structural Ignitability Policies and Programs (Ch. 8):</u>			
<ol style="list-style-type: none"> Identify a DTD representative for the WFEP. Improve coordination with Rural Fire Agencies. Integrate WU into Plan Map and include a public outreach strategy. 			
Coordinating Organization:		TVF&R	
Internal Partners:		External Partners:	
Public Works, Parks and Recreation, Natural Resources		Clackamas Fire Defense Board, Oregon Department of Forestry, U.S. Forest Service, U.S. Bureau of Land Management, public land management agencies	
Potential Funding Sources:		Estimated cost:	Timeline:
ODF, operating budgets		Low to High	<input type="checkbox"/> Short Term (0-2 years) <input type="checkbox"/> Long Term (2-4+ years) <input checked="" type="checkbox"/> Ongoing
Form Submitted by:	New Action Item		
Priority:	High (<i>CWPP identified priority actions listed above</i>)		

ATTACHMENT B: PUBLIC INVOLVEMENT SUMMARY

Members of the HMAC provided edits and updates to the NHMP prior to the public review period as reflected in the final document.

To provide the public information regarding the draft NHMP addendum, and provide an opportunity for comment, an announcement (see text below) was announced on the city's [website](#) (including the draft plan and an opportunity to comment) and via social media (NextDoor, Facebook, Twitter). In addition, the City conducted an interview with the local newspaper (Wilsonville Spokesman) but a story was not published. The opportunity to review the draft plan and to comment was left open from December 27, 2018 through January 15, 2019.

During the public review period there were no formal comments provided; however, the draft plan received at least 50 clicks.

City Website Announcement

The screenshot shows the City of Wilsonville website. At the top, there is a header with the city logo, contact information (503-682-1011), a contact button, a subscribe button, a search bar, and social media icons. Below the header is a navigation menu with categories: RESIDENTS, GOVERNMENT, BUSINESS, and RESOURCES. The main content area is divided into three columns. The left column is a sidebar with a green header 'PUBLIC WORKS' and several menu items: WHAT PUBLIC WORKS DOES, ADOPT-A-ROAD, BACKFLOW, BULK WATER METERS, EMERGENCY MANAGEMENT, INDUSTRIAL PRETREATMENT, WASTE WATER TREATMENT PLANT, WATER TREATMENT PLANT, and DOCUMENTS - PUBLIC WORKS. The middle column is titled 'Natural Hazards Mitigation Plan Comments' and contains the following text: 'In accordance with state and federal law, The City of Wilsonville is required to have a Natural Hazards Mitigation Plan (NHMP) that articulates the City's short- and long-term plans to mitigate potential natural hazards that could occur within our region. These natural hazards include earthquakes, floods, wildfires and severe winter storms. The City's NHMP was developed in concert with the Clackamas County Department of Disaster Management's recent countywide update, and includes input from the City's Engineering, Public Works, Planning and Community Development divisions. This draft plan can be accessed below under "Supporting Documents." The plan is subject to public review and comment before adoption as an addendum to the Clackamas County NHMP. The plan is effective for a five-year period following adoption. For more information, or to submit feedback on this plan before January 15, contact Martin Montalvo, Public Works Operations Manager, at 503-570-1560; montalvo@ci.wilsonville.or.us.' Below the text is a 'Supporting Documents' section with a link to 'Wilsonville National Hazards Mitigation Plan (NHMP) DRAFT (4 MB)'. At the bottom of the middle column is a comment form with fields for 'Name', 'E-mail Address', and a large text area for the comment. The right column is titled 'Contact' and contains information for 'PUBLIC WORKS': Phone: 503-682-4092, Fax: 503-682-8816, Emergency/After Hours Phone: 1-866-252-3614, Water Feature Hotline Phone: 503-685-6356, Site Address: 30000 SW Town Center Loop E, Wilsonville, OR 97070, Get Directions, Mailing Address: 29799 SW Town Center Loop E, Wilsonville, OR 97070, Monday - Friday 7:30am - 4:30pm, and a link to View Staff Directory.

Social Media Announcements

Natural Hazards Mitigation Plan (NHMP)

In accordance with state and federal law, The City of Wilsonville is required to have a Natural Hazards Mitigation Plan (NHMP) that articulates the City's short- and long-term plans to mitigate potential natural hazards that could occur within our region. This draft NHMP plan is subject to public review and comment before adoption. To See more...



New 16h ago · Subscribers of City of Wilsonville

Reply

E Elaine M., Wilsonville · 12h ago **New**
I sure hope we never see a flood like that 😊



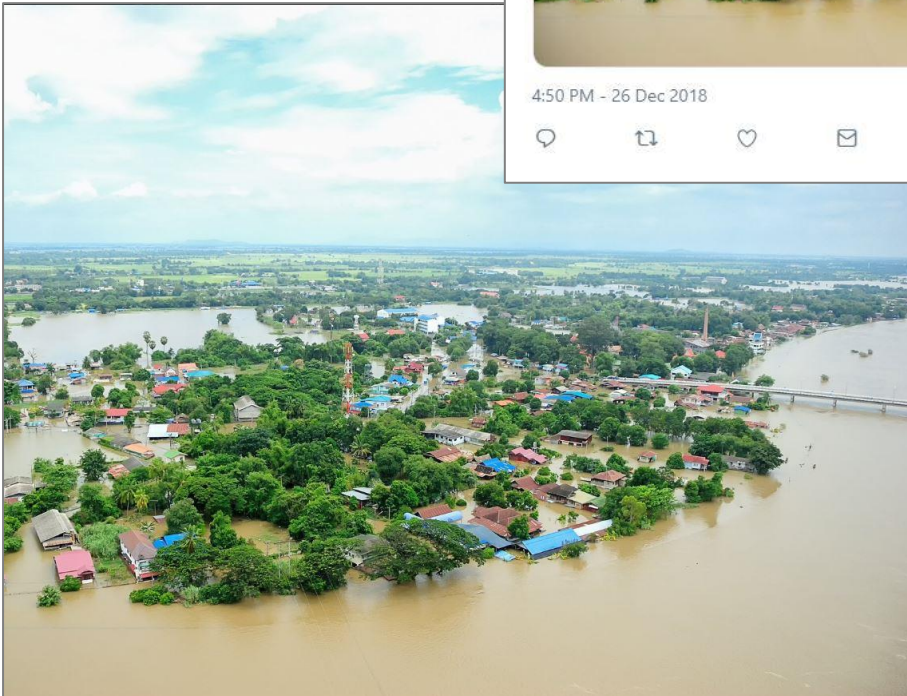
City of Wilsonville
@WilsonvilleOR

Following

The City is required to have a Natural Hazards Mitigation Plan (NHMP) that articulates the City's plans to mitigate potential natural hazards. This draft plan is subject to public review and comment before adoption. To review or comment, visit bit.ly/2EKMinb



4:50 PM - 26 Dec 2018



comment before adoption. to review, comment (by Jan. 15) or learn more about the plan, visit <http://bit.ly/2EKMinb>

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4 1 Comment 1 Share

Like Comment Share

Most Relevant

Karen Blase Let the residents know before a testing! Is there a schedule for tests?
Like Reply Message 11h

Wilsonville - Local Government
No tests. Just sharing a plan that guides preventative measures the City would develop to minimize loss of life and property damage should an event occur.

Like Reply Commented on by William Evans (?) · 1m

Write a comment...