



City of Wilsonville

Natural Hazards Mitigation Plan Addendum

Prepared for
City of Wilsonville
29799 SW Town Center Loop E
Wilsonville, OR 97070

In cooperation with

Clackamas County Emergency Management
2200 Kaen Road
Oregon City, OR 97045

Adopted by City Council on February 17, 2010



FEMA

March 9, 2010

Honorable Lynn Peterson,
Chair, Board of County Commissioners
2051 Kaen Road
Oregon City, Oregon 97045

Dear Chair Peterson:

On October 19, 2007, the U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) approved the *Clackamas County Natural Hazards Mitigation Plan Update 2007* as a multi-jurisdictional local plan as outlined in 44 CFR Part 201. With approval of this plan, the following entities are now eligible to apply for the Robert T. Stafford Disaster Relief and Emergency Assistance Act's hazard mitigation project grants through October 19, 2012:

Clackamas County
City of Estacada
City of Oregon City
City of Gladstone

City of Canby
City of Johnson City
City of Sandy
City of Wilsonville

City of Damascus
City of Milwaukie
City of West Linn

The list of approved jurisdictions has been updated to include the City of Wilsonville, which has recently adopted the *Clackamas County Natural Hazards Mitigation Plan Update 2007*. To continue eligibility the plan must be reviewed, revised as appropriate, and resubmitted 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 our State counterpart, Oregon Emergency Management, which coordinates and administers these efforts for local entities.

Sincerely,

A handwritten signature in blue ink that reads "Mark Carey".

Mark Carey, Director
Mitigation Division

cc: Dennis Sigrist, Oregon Emergency Management

BH:bb

RESOLUTION NO. 2226

A RESOLUTION OF THE CITY OF WILSONVILLE FOR FINAL ADOPTION OF THE CITY'S ADDENDUM TO THE CLACKAMAS COUNTY MULTI-JURISDICTION HAZARD MITIGATION PLAN

WHEREAS, the City of Wilsonville has participated in the development of the City of Wilsonville Addendum to the Clackamas County Multi-Jurisdictional Natural Hazard Mitigation Plan, which has established a comprehensive, coordinated planning process to eliminate or minimize vulnerabilities related to natural, technological and societal disasters; and

WHEREAS, on November 16, 2009, the City Council conducted a public hearing on the Addendum, received testimony and report exhibits and the Council adopted Resolution 2213 to tentatively approve the Addendum thereby agreeing to refer the Addendum on to Federal Emergency Management Agency (FEMA) for its preliminary review, comment and approval; and

WHEREAS, U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) completed a pre-adoption review of the City of Wilsonville Addendum to the Clackamas County Hazard Mitigation Plan; and in a letter from FEMA dated January 13, 2010, FEMA committed to giving final approval to the plan upon receiving final adoption documentation from the City; and

WHEREAS, until the Plan is formally approved by FEMA the City is not eligible for any mitigation project grants funds.

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

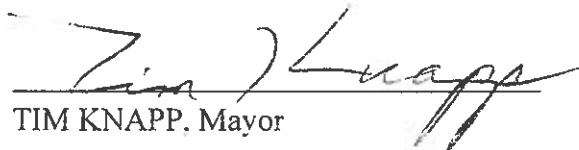
1. The City hereby gives final approval for its Addendum to the Clackamas County Multi-jurisdiction Hazard Mitigation Plan.
2. The City staff is requested to pursue available funding opportunities for the implementation of the actions and proposal designed therein.
3. The City will, upon receipt of such funding or other necessary resources seek to implement the mitigation on proposals identified by the City of Wilsonville's Hazard Mitigation Planning Committee.

4. The City will continue to participate in the updating and expansion of the Clackamas County Multi-jurisdiction Hazard Mitigation Plan in the years ahead.

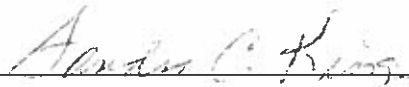
5. The City will further seek to encourage the businesses, industries and community groups operating within and/or for the benefit of the City of Wilsonville to also participate in the updating and expansion of the Clackamas County Multi-jurisdiction Hazard Mitigation Plan in the years ahead

6. This resolution is effective upon adoption.

ADOPTED by the Wilsonville City Council at a special meeting this 17 day of February 2010, and filed with the Wilsonville City Recorder this date.


TIM KNAPP, Mayor

ATTEST:


Sandra C. King, MMC, City Recorder

SUMMARY OF VOTES:

Mayor Knapp - Yes
Councilor Kirk - Yes
Councilor Núñez - Excused
Councilor Ripple - Yes
Councilor Hurst - Yes

Attachments:

Exhibit A- City of Wilsonville Natural Hazard Mitigation Plan Addendum
Exhibit B – Pre-adoption review and commitment letter from FEMA

City of Wilsonville

Natural Hazards Mitigation Plan Addendum

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Overview

What is Natural Hazard Mitigation?

Natural hazard mitigation is defined as permanently reducing or alleviating the losses of life, property and injuries resulting from natural hazards through long and short-term strategies. Example strategies include policy changes, such as updated ordinances; projects, such as seismic retrofits to critical facilities; education and outreach to targeted audiences, such as Spanish speaking residents, or the elderly. Mitigation is the responsibility of individuals, private businesses and industries, state and local governments, and the federal government.

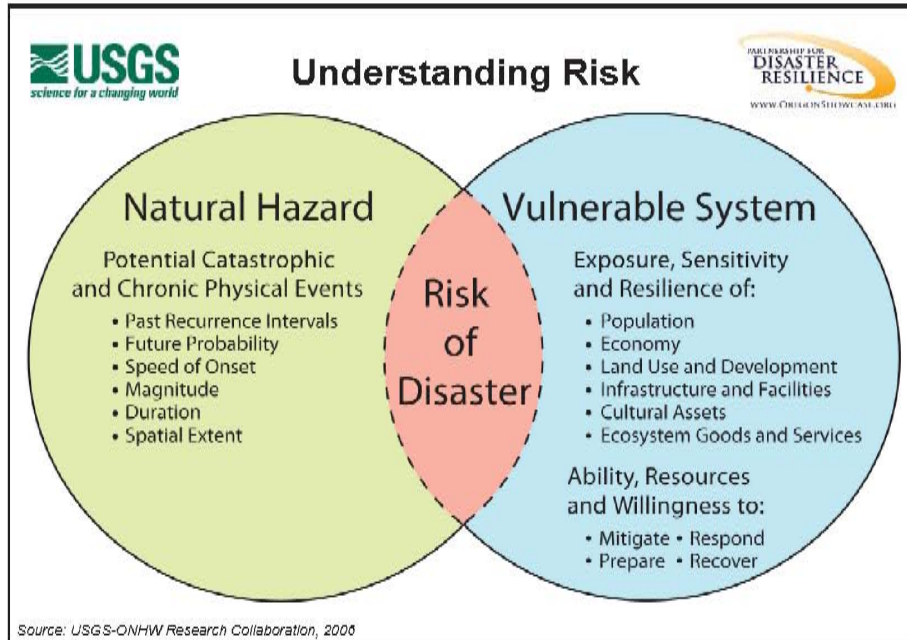
Engaging in mitigation activities provides jurisdictions with a number of benefits, including reduced loss of life, property, essential services, critical facilities and economic hardship; reduced short-term and long-term recovery and reconstruction costs; increased cooperation and communication within the community through the planning process; and increased potential for state and federal funding for recovery and reconstruction projects.

Why Develop a Mitigation Plan?

The City of Wilsonville developed this addendum to the Clackamas County multi-jurisdictional Natural Hazards Mitigation Plan in an effort to reduce future loss of life and damage to property resulting from natural hazards. It is impossible to predict exactly when disasters will occur, or the extent to which they will affect the city. However, with careful planning and collaboration among public agencies, private sector organizations, and citizens within the community, it is possible to minimize the losses that can result from natural hazards.

The figure below is utilized throughout the plan to illustrate the concepts of risk reduction.

Figure 1 Understanding Riskⁱ



A natural hazard mitigation plan can assist the community in understanding what puts the community at risk. By identifying and understanding the relationship between natural hazards, vulnerable systems, and existing capabilities, the City of Wilsonville can become better equipped to identify and implement actions aimed at reducing the overall risk of hazards.

This plan focuses on the primary natural hazards that could *affect* Wilsonville, Oregon, which include flood, landslide, wildfire, severe storms, earthquake and volcano. The dramatic increase in the costs associated with natural disasters over the past decades has fostered interest in identifying and implementing effective means of reducing vulnerability. A report submitted to Congress by the National Institute of Building Science’s Multi-hazard Mitigation Council (MMC) highlights that for every dollar spent on mitigation, society can expect an average savings of \$4.ⁱⁱ This addendum to the Clackamas County multi-jurisdictional Natural Hazards Mitigation Plan is intended to assist the City of Wilsonville in reducing its risk from natural hazards by identifying resources, information, and strategies for risk reduction.

The plan 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 city’s Comprehensive Plan, Transportation Systems Plan, and Water System Master Plan, as well as the State of Oregon Natural Hazards Mitigation Plan.

The plan provides a set of actions to prepare for and reduce the risks posed by natural hazards through education and outreach programs, the development of partnerships, and the implementation of preventative activities. The actions described in the plan are intended to be implemented through existing plans and programs within the city.

Policy Framework for Natural Hazards in Oregon

Planning for natural hazards is an integral element of Oregon's statewide land use planning program, which began in 1973. All Oregon cities and counties have comprehensive plans and implementing ordinances that are required to comply with the statewide planning goals. The challenge faced by state and local governments is to keep this network of local plans coordinated in response to the changing conditions and needs of Oregon communities.

Statewide land use planning Goal 7: Areas Subject to Natural Hazards calls for local plans to include inventories, policies and ordinances to guide development in or away from hazard areas. Goal 7, along with other land use planning goals, has helped to reduce losses from natural hazards. Through risk identification and the recommendation of risk-reduction actions, this plan aligns with the goals of the jurisdiction's Comprehensive Plan, and helps each jurisdiction meet the requirements of statewide land use planning Goal 7.

The primary responsibility for the development and implementation of risk reduction strategies and policies lies with local jurisdictions. However, resources exist at the state and federal levels. Some of the key agencies in this area include Oregon Emergency Management (OEM), Oregon Building Codes Division (BCD), Oregon Department of Forestry (ODF), Oregon Department of Geology and Mineral Industries (DOGAMI), and the Department of Land Conservation and Development (DLCD).

The Disaster Mitigation Act of 2000 (DMA 2000) is the current federal legislation addressing mitigation planning. It reinforces the importance of mitigation planning and emphasizes planning for natural hazards before they occur. As such, this Act established the Pre-Disaster Mitigation (PDM) grant program and new requirements for the national post-disaster Hazard Mitigation Grant Program (HMGP). Section 322 of the Act specifically addresses mitigation planning at the state and local levels, and CFR 201 provides information on the policies and procedures for mitigation planning. Local jurisdictions must have approved mitigation plans in place in order to qualify to receive post-disaster HMGP funds. Additionally, mitigation plans must demonstrate that their proposed mitigation measures are based on a sound planning process that accounts for the risk to the individual and their capabilities.

Section 1: Planning Process

1.1 How was the Addendum Developed?

In the fall of 2007, the Oregon Partnership for Disaster Resilience (OPDR / the Partnership) at the University of Oregon's Community Service Center partnered with Oregon Emergency Management, Resource Assistance for Rural Environments (RARE), Clackamas County, and cities within Clackamas County to develop a Hazard Mitigation Grant Program (HMGP) planning grant proposal. The City of Wilsonville joined the Partnership by signing a memorandum of understanding for this project. FEMA awarded the Partnership with a grant to support the development and update of city addenda in Clackamas County, and Wilsonville's local planning efforts began in May 2009. RARE provided a staff person ('RARE Participant') to facilitate and document the city's addendum development process.

Participants in Planning Process

Representatives from the city's Hazard Mitigation Advisory Committee (HMAC) served as steering committee members for the City of Wilsonville's natural hazards mitigation planning process. Committee members included:

- Martin Brown, City of Wilsonville Building Official
- Raymond Brunstrom, Citizen of Wilsonville, Retired Fire Chief
- Blaise Edmonds, City of Wilsonville Planning Division
- Randy Edmiston, Sysco Portland, Inc. Facilities Director
- John Fraser, Sysco Portland, Inc. Director of Human Resources and Safety
- Delora Kerber, City of Wilsonville Emergency Management Coordinator and Public Works Director
- Steve Munsterman, City of Wilsonville Public Works Supervisor
- Laurel Reimer, Clackamas County Emergency Management/RARE
- Jeffery Rubin, Tualatin Valley Fire & Rescue Emergency Manager
- Daniel Stark, City of Wilsonville GIS Manager
- Tim Woodley, West Linn-Wilsonville School District Director of Operations

Planning Process

The RARE Participant and Clackamas County Emergency Management developed and facilitated three plan development meetings with the Hazard Mitigation Advisory Committee on May 6th, May 29th, and June 19th, 2009. Please see Appendix A for meeting agendas and minutes.

Introduction – May 6, 2009: the RARE participant met with members of the HMAC to review the planning process and requirements. The RARE Participant provided a rough agenda for the two subsequent planning meetings and explained what assistance she would need.

Risk Assessment – May 29, 2009: Between May and June 2009, the RARE Participant researched the causes and characteristics of natural hazards in Wilsonville, as well as past events. On May 29, 2009 the RARE Participant facilitated the first of two plan development meetings with the HMAC. Group members identified and discussed past hazard events, vulnerable systems within the community, and existing emergency management capabilities. Additionally, the group identified various public involvement activities to implement during the planning process, as well as continued public involvement strategies that could occur after the plan’s completion. The HMAC also identified a future coordinating body for Wilsonville’s Natural Hazards Mitigation Plan Addendum, as well as a plan convener.

Action Items – June 19, 2009: Between May and July, 2009 the RARE Participant drafted the community’s Risk Assessment (see Section 3 below), and developed a list of potential mitigation actions based on vulnerabilities identified at the May 29th plan development meeting. On June 19th, 2009 the RARE Participant facilitated the second of two plan development meetings with the HMAC. Group members discussed the RARE Participant’s proposed mitigation actions, and developed a final list of actions. Additionally, the HMAC developed a future meeting schedule (see 1.3 Plan Implementation and Maintenance below).

Public Involvement

Following completion of the final draft, the city issued a press release (see Appendix A) that informed residents about the Natural Hazards Mitigation Plan, and requested public input at the November 16th, 2009 City Council meeting. Additionally, the City of Wilsonville notified residents about the mitigation plan via email, through Facebook and Twitter (i.e., social networking sites), and by announcing the plan on the local government channel. Lastly, the city sent a notice to the Chamber of Commerce to distribute information throughout the local business community. Delora Kerber, the City of Wilsonville’s Emergency Management Coordinator and Public Works Director, served as the point of contact for all public comments. Residents were given two weeks to review and comment on the plan. Comments were integrated into the final draft, where applicable.

Adoption

The City of Wilsonville adopted the Clackamas County Natural Hazards Mitigation Plan via resolution on February 17, 2010.

1.2 Addendum Mission and Goals

Because this is an addendum to the Clackamas County Natural Hazards Mitigation Plan, the City of Wilsonville has chosen to adopt Clackamas County’s Plan mission and goals. The city’s Hazard Mitigation Advisory Committee believes that Clackamas County’s plan mission and goals accurately reflect those of Wilsonville as well. Likewise, adopting the county’s mission and goals promotes cohesion between the two plans.

Mission

The mission of the Clackamas County Natural Hazards Mitigation Plan is to 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.

Goals

Protect Life and Property

- Implement activities that assist in protecting lives by making homes, businesses, infrastructure, critical facilities, and other property more resistant to losses from 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.

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.

Enhance Natural Systems

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

Encourage Partnerships and 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.

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, business, and industry.
- Coordinate and integrate natural hazard mitigation activities, where appropriate, with emergency operations plans and procedures.

1.3 Plan Implementation and Maintenance

This section details the formal process that will ensure that the Wilsonville Addendum to the Clackamas County Natural Hazards Mitigation Plan remains an active and relevant document. The plan implementation and maintenance process includes a schedule for monitoring and evaluating the plan annually, as well as producing an updated plan every five years. Finally, this section describes how the city will integrate public participation throughout the plan maintenance and implementation process.

Implementing the Plan

After the plan is locally reviewed and deemed complete, the Emergency Management Coordinator will submit the plan to the State Hazard Mitigation Officer at Oregon Emergency Management. Oregon Emergency Management submits the plan to the Federal Emergency Management Agency (FEMA--Region X) for review. This review addresses the federal criteria outlined in the FEMA Interim Final Rule 44 CFR Part 201. Upon acceptance by FEMA, the Wilsonville City Council will adopt the plan via resolution. At that point the city will gain eligibility for the Pre-Disaster Mitigation Grant Program, the Hazard Mitigation Grant Program, and the Flood Mitigation Assistance program.

Coordinating Body

The Hazard Mitigation Advisory Committee will serve as the coordinating body for Wilsonville's Natural Hazards Mitigation Plan Addendum. Roles and responsibilities of the coordinating body include:

- Serving as the local evaluation committee for funding programs such as the Pre-Disaster Mitigation Grant Program, the Hazard Mitigation Grant Program, and Flood Mitigation Assistance program;
- Prioritizing and recommending funding for natural hazard risk reduction projects;
- Encouraging stakeholders, and relevant hazard mitigation organizations and agencies to implement and/or report on implementation of the plan's identified action items;
- Evaluating and updating the Natural Hazards Mitigation Plan Addendum following a disaster;
- Evaluating and updating the Natural Hazards Mitigation Plan Addendum in accordance with the prescribed plan maintenance schedule; and
- Developing and coordinating ad hoc and/or standing subcommittees. The HMAC will engage relevant organizations, agencies, and/or neighboring communities as technical advisers in hazard mitigation as needed.

Convener

The Wilsonville Emergency Management Coordinator will serve as the plan's convener. The convener's roles and responsibilities include:

- Assigning additional stakeholders and representatives to the coordinating body as needed;

- Coordinating HMAC meeting dates, times, locations, agendas, and member notification;
- Documenting the outcomes of HMAC meetings;
- Serving as a communication conduit between the HMAC and the public and/or key plan stakeholders;
- Identifying emergency management-related funding sources for natural hazard mitigation projects;
- Facilitating the incorporation, maintenance, and update of the city's natural hazard risk GIS data elements;
- Utilizing the risk assessments as a tool for prioritizing proposed natural hazard risk reduction projects; and
- Facilitating and documenting the plan's five-year update.

Implementation through Existing Programs

This plan is strategic and non-regulatory in nature, meaning that it does not set forth any new policy. It does, however, provide: (1) a foundation for coordination and collaboration among agencies and the public; (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, Building Codes, as well as the Clackamas County Natural Hazards Mitigation Plan, and the State of Oregon Natural Hazards Mitigation Plan. The mitigation actions described in Section 4 below are intended to be implemented through existing plans and programs within the city. Implementation opportunities are further defined in the action item worksheets (Appendix B) when applicable.

Plan Maintenance

Plan maintenance is a critical component of the natural hazard mitigation plan addendum. Proper maintenance of the plan ensures that this plan will maximize the city's efforts to reduce the risks posed by natural hazards. This section includes a process to ensure that regular review and update of the plan occurs. The Hazard Mitigation Advisory Committee and Emergency Management Coordinator will be responsible for maintaining the plan.

Semi-Annual Meetings

The HMAC will meet on a semi-annual basis. Meetings will be held in April and October of each year to allow the committee to debrief on the previous hazard seasons and prepare for the upcoming hazard seasons. In addition to debriefing and preparing for the upcoming hazard seasons, at the first meeting the committee will:

- Discuss funding opportunities for the implementation of mitigation strategies.
- Review existing action items to determine appropriateness for funding;
- Educate and train new members on the plan and mitigation in general; and
- Identify issues that may not have been identified when the plan was developed.

During the second meeting of each year, the committee will:

- Review existing and new risk assessment data, and incorporate this information into the plan;

- Document success in implementing mitigation actions and/or applying for funding;
- Discuss the addition and/or subtraction of mitigation actions from the plan;
- Discuss methods for continued public involvement;
- Document successes and lessons learned during the year; and
- Generate a list of members that should be included in future meetings.

The convener will be responsible for documenting the outcome of the semi-annual meetings. The process the HMAC will use to prioritize mitigation projects is detailed in Section 4 below. The plan's format allows the city to review and update sections when new data becomes available. New data can be easily incorporated, resulting in a natural hazards mitigation plan that remains both current and relevant.

Five-Year Plan Update

Local mitigation plans must be updated and resubmitted to the Federal Emergency Management Agency (FEMA) for approval every five years in order to maintain eligibility for federal hazard mitigation assistance programs.¹ Plan updates must demonstrate that progress has been made in the past five years for local mitigation plans to fulfill commitments outlined in the previously approved plan.

Wilsonville's Natural Hazards Mitigation Plan Addendum will be updated every five years in accordance with the Disaster Mitigation Act of 2000. Because this is an addendum to the Clackamas County Natural Hazards Mitigation Plan, the addendum must be updated in conjunction with the county's five-year plan update schedule. As such, Wilsonville must update this addendum by September 2012 (and then again five years thereafter). Sufficient time should be allotted for plan update activities and FEMA review, meaning the city should begin the plan update process by September 2011. The HMAC will spend four to five months updating the plan, and remaining months will be dedicated to FEMA review and edits. Additional time will be needed if the city intends to pursue application for mitigation planning grants, and/or contracting for technical or professional services.

During the five-year plan update, the city will review and revise the addendum to reflect changes in development, progress in mitigation efforts, and changes in priorities. The following questions will be asked to determine what actions are necessary in updating the addendum:

- Have public involvement activities taken place since the plan was adopted?
- Are the plan goals still relevant?
- Is mitigation being implemented through existing planning mechanisms (such as comprehensive plans, or capital improvement plans)?
- Are there new hazards that should be addressed?
- Have there been hazard events in the community since the plan was adopted?

¹ 44 CFR 201.6(d)(3): A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within 5 years in order to continue to be eligible for mitigation project grant funding.

- Have new studies or previous events identified changes in any hazard's location or extent?
- Has vulnerability to any hazard changed?
- Have development patterns changed? Is there more development in hazard prone areas?
- Do future annexations include hazard prone areas?
- Did the plan identify the number and type of existing and future buildings, infrastructure, and critical facilities in hazards areas?
- Are there new high risk populations?
- Did the plan document and/or address National Flood Insurance Program repetitive loss properties?
- Is there an action dealing with continued compliance with the National Flood Insurance Program?
- Did the plan identify data limitations?
- Did the plan identify potential dollar losses for vulnerable structures?
- What is the status of each mitigation action?
- Are there completed mitigation actions that have decreased overall vulnerability?
- Are there new actions that should be added?
- Are changes to the action item prioritization, implementation, and/or administration processes needed?
- Do changes need to be made within the five year update schedule?

The convener will be responsible for (1) organizing the HMAC to address plan update needs; (2) updating any deficiencies found in the plan; and (3) ensuring the plans meets the Disaster Mitigation Act of 2000's plan update requirements.

Continued Public Involvement & Participation

The City of Wilsonville is dedicated to involving the public directly in the continual reshaping and updating of the Natural Hazards Mitigation Plan Addendum. Although members of the HMAC represent key community constituencies, the general public will additionally have the opportunity to provide feedback on future plan amendments and updates.

During the plan development process, public participation was incorporated into every stage of the plan development process. To ensure that these opportunities will continue, hard copies of the plan will be available at City Hall. Online copies of the plan will be found at the city's website and the West Linn-Wilsonville School District and Chamber of Commerce websites will link to the city site. Articles about the plan will be published in the Wilsonville Spokesman (newspaper) and Boones Ferry Messenger (newsletter). Public meetings regarding plan content will be scheduled when deemed necessary, such as after a natural hazard event.

In addition to the involvement activities listed above, the city's Natural Hazards Mitigation Plan Addendum has been archived and posted on the University of Oregon

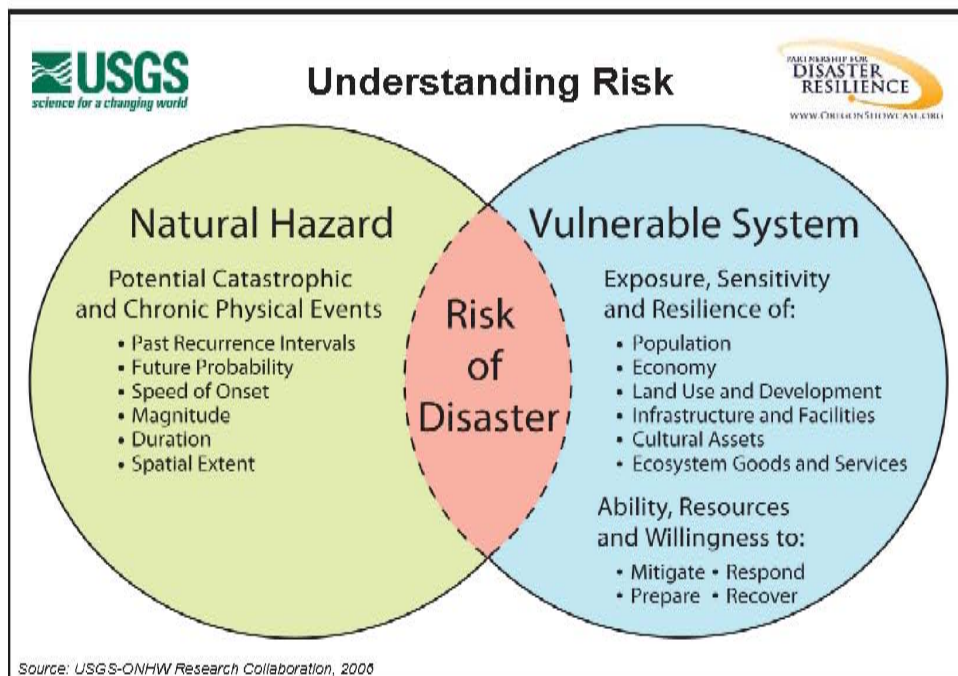
Libraries' Scholar's Bank Digital Archive.² Contact information is posted on all plan copies.

² University of Oregon Scholars Bank, Natural Hazards Mitigation Plans:
<https://scholarsbank.uoregon.edu/xmlui/handle/1794/1930>

Section 2: Community Profile

The following section describes the City of Wilsonville from a number of perspectives in order to help define and understand the city’s sensitivity and resilience to natural hazards. Sensitivity factors can be defined as those community assets and characteristics that may be impacted by natural hazards, (e.g., special populations, economic factors, and historic and cultural resources). Community resilience factors can be defined as the community’s ability to manage risk and adapt to hazard event impacts (e.g., governmental structure, agency missions and directives, and plans, policies, and programs). The information in this section represents a snapshot in time of the current sensitivity and resilience factors in the city when the plan was developed. The information documented below, along with the hazard assessments located in Section 3: Hazard Assessment should be used as the local level rationale for the city’s mitigation strategies. The identification of actions that reduce the city’s sensitivity and increase its resilience assist in reducing overall risk, or the area of overlap in Figure 2 below.

Figure 2: Understanding Riskⁱⁱⁱ



2.1 Geography & Environment

The City of Wilsonville is located in Clackamas County, Oregon, 20 miles south of the City of Portland along the I-5 corridor. Wilsonville is located in Oregon’s Willamette Valley which experiences a moderate climate. In August the average high temperature is 80.6 degrees and the average low temperature is 52.5 degrees. Wintertime temperatures

in January range from an average high of 46.5 degrees to an average low of 33 degrees.^{iv} The average annual precipitation is 40.78 inches.^v

The Willamette River passes through Wilsonville. The Willamette River is the major waterway in the Willamette Valley, and it drains a total of 11,500 square miles. The Willamette provides significant recreational opportunities, serves as a major transportation link, provides water for agricultural, municipal and industrial uses and provides habitat for significant wildlife populations.

2.2 Population & Demographics

Wilsonville has changed significantly in population since it was first incorporated in October, 1968. Wilsonville’s proximity to the Highway Interstate System has contributed to its growth. Its location next to I-205 and I-5 allows residents to access Portland within 20 minutes and Salem within 30 minutes. Since 2000, the population has increased by 3,575 people. In 2008 Wilsonville grew 3% in comparison with the 1.2% increases in Clackamas County and Oregon. Table 2.1 shows the estimated population growth between the 2000 Census and 2008. According to the 2000 census, the majority of Wilsonville’s residents are white. The largest minority group is Hispanic or Latino, which represents 6.9% of the population (See Table 2.2 below).

Table 2.1 Population Change Estimates from 2000 to 2008

Year	Wilsonville	Percent Change	Clackamas County	Percent Change	Oregon	Percent Change
2000	14,365		340,000		3,436,750	
2001	14,170	-1.4%	345,150	1.5%	3,471,700	1.0%
2002	15,590	10.0%	350,850	1.7%	3,504,700	1.0%
2003	15,880	1.8%	353,450	0.7%	3,541,500	1.1%
2004	16,250	2.3%	356,250	0.8%	3,582,600	1.2%
2005	16,510	1.6%	361,300	1.4%	3,631,440	1.4%
2006	16,885	2.3%	367,040	1.6%	3,690,505	1.6%
2007	17,405	3.1%	372,270	1.4%	3,745,455	1.5%
2008	17,940	3.0%	376,660	1.2%	3,791,060	1.2%

Source: Portland State University Research Center^{vi}

Table 2.2 Population by Race in 2000

Race	Number	Percent
White	12,655	97.3%
Hispanic or Latino (of any race)	971	6.9%
Some other race	441	3.2%
Two or more races	371	2.7%
Asian	311	2.2%
American Indian or Alaska Native	98	0.7%
Black	92	0.7%
Native Hawaiian and other Pacific Islander	23	0.2%

Source: US Census Bureau, 2000 Census^{vii}

Disaster impacts in terms of loss and the ability to recover vary among population groups following a disaster. Historically, 80% of the disaster burden falls on the public. Of this number, a disproportionate burden is placed upon special needs groups, particularly children, the elderly, the disabled, minorities, and low income persons. Portions of Wilsonville’s residents fall into these special needs populations. According to the 2000 Census, approximately 5.6% of Wilsonville’s population had an income below the poverty level.

In addition, Table 2.3 shows that 14.4% of the population is 65 years of age or older. Elderly individuals require special consideration due to their sensitivities to heat and cold, their reliance upon public transportation for medications, and their comparative difficulty in making home modifications that reduce risk to hazards. Additionally, language barriers can hinder public outreach strategies with residents that speak English as a second language. According to the 2000 census, 10.4% of Wilsonville residents speak a language other than English, and 4.4% of the population speaks English less than “very well.” More information regarding the city’s special needs populations is shown below in Tables 2.3 - 2.5.

Table 2.3 Population by Age, 2000

Age Range	Total Persons	% of Total Population
Under 5	1,059	7.6%
5 to 19	2,676	19.1%
20 to 44	5,416	38.7%
45 to 64	2,820	20.2%
65 and over	2,020	14.4%
Total	13,991	100%

Source: US Census Bureau, 2000 Census^{viii}

Table 2.4 Disabled Population 2000

Age	Number of People
5 to 15	174
16 to 64	854
65 and older	738
Total	1,766

Source: US Census Bureau, 2000 Census^x

Table 2.5 Speak English Less Than Very Well 2000

Speak English less than "very well"	Total	Percent
5 to 17 years	93	0.7%
18 to 64 years	452	3.5%
65 years and over	25	0.2%
Total	570	4.4%

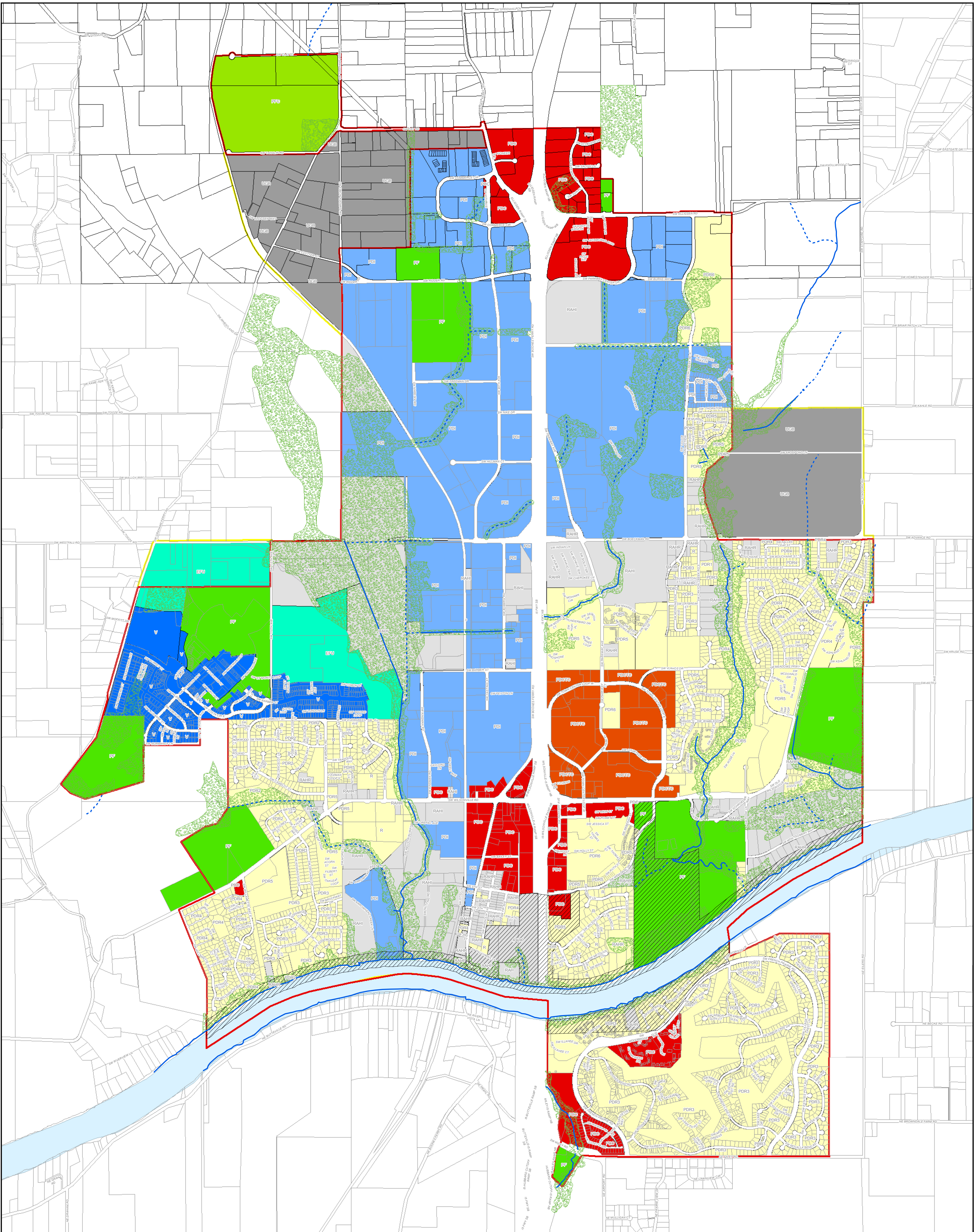
Source: US Census Bureau, 2000 Census^x

2.3 Land Use & Development

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 community development department ensures that infrastructure development is in line with the city's growing population. The department also monitors the city's master plans such as the Stormwater Master Plan, Parks and Recreation Master Plan and the Transportation Master Plan.

Wilsonville's Comprehensive Plan guides the physical development of the city. The Comprehensive Plan includes goals, policies, and implementation measures for the development of the city. According to the Comprehensive Plan, land has been designated for public, industrial, commercial, and residential use. The residential planned density range has been increased while the higher end has not changed. Residential development is 80% of the maximum density allowed. The Wilsonville zoning map, page 13 below, demonstrates the land distribution for the City of Wilsonville. The Significant Resource Overlay Zone (SROZ) map, page 14 below, 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 the site.



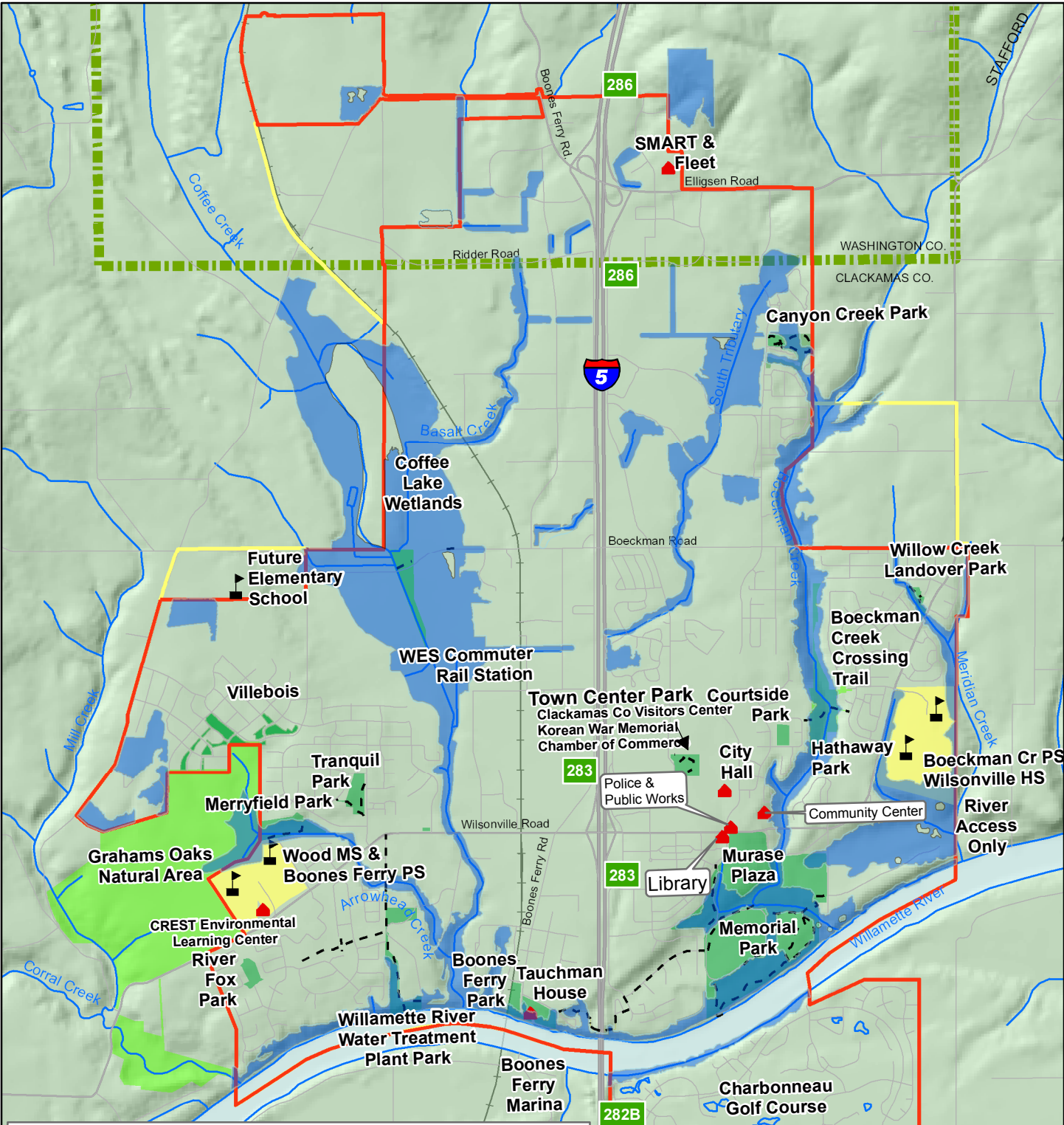
City of Wilsonville Zoning Map

- | | |
|-------------------------------------|---|
| Exclusive Farm Use | Public Facilities |
| Planned Development Commercial | Public Facilities - Corrections |
| Planned Development Commercial TC | Residential |
| Planned Development Industrial | Residential Agriculture Holding |
| Planned Development Residential | Residential Agriculture Holding Commercial |
| Planned Development Residential - 1 | Residential Agriculture Holding Industrial |
| Planned Development Residential - 2 | Residential Agriculture Holding Public |
| Planned Development Residential - 3 | Residential Agriculture Holding Residential |
| Planned Development Residential - 4 | Residential Agriculture Holding Village |
| Planned Development Residential - 5 | Urban Growth Boundary |
| Planned Development Residential - 6 | Village |

- | |
|---------------------------|
| Willamette River Greenway |
| SROZ |
| City Limits |
| Urban Growth Boundary |
| Streams |
| Intermittent |
| Perennial |

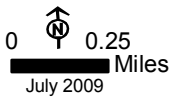


Disclaimer: The City of Wilsonville makes no representations, express or implied, as to the accuracy, completeness and timeliness of the information displayed. Data errors and omissions may exist in map and report. This map is not suitable for legal, engineering, or surveying purposes. Please contact the City of Wilsonville Planning Department to verify report information is complete and accurate.



The City of **Wilsonville** Sensitive Resource Overlay Zone

- SROZ**
- Impact Area**
- EXIT** I-5 Exit Numbers
- ~ Streams
- ~ City Limits
- ~ UGB



Note: All information is subject to change. Every effort is taken to eliminate errors and omissions but please contact the City of Wilsonville to confirm information before taking any action.

C:\GIS\projects\2009\072709_NHazards\NHazards_SROZ.mxd

2.4 Housing

Housing type and age are important factors in mitigation planning. Certain housing types tend to be less disaster resistant and warrant special attention: mobile homes, for example, are generally more prone to wind and water damage than standard stick-built homes. Generally the older the home is, the greater the risk of damage from natural disasters. This is because stricter building codes have been developed following improved scientific understanding of plate tectonics and earthquake risk. For example, structures built after the late 1960s in the Northwest and California use earthquake resistant designs and construction techniques. In addition, FEMA began assisting communities with floodplain mapping during the 1970s, and communities developed ordinances that required homes in the floodplain to be elevated to one foot above Base Flood Elevation. About 25.2% of Wilsonville’s housing stock was built before stricter seismic building codes were put in place (see Table 2.6 below).

Table 2.6 Age of Housing Structures

Year structure built	Number of Structures	Percent of Structures
1990 to March 2000	3,116	48.6%
1980 to 1989	1,680	26.2%
1970 to 1979	1,379	21.5%
1960 to 1969	163	2.5%
1940 to 1959	46	0.7%
1939 and earlier	35	0.5%
Total	6,419	100%

Source: US Census Bureau, 2000 Census^{xi}

As of 2000, Wilsonville had 6,419 housing units of which 92.7% were occupied and 7.3% were vacant. Of the occupied housing units, 53.9% were owner-occupied and 46.1% were renter occupied.^{xii} Studies have shown that renters are less likely than homeowners to prepare for catastrophic events.^{xiii} Renters tend to have higher turnover rates that may limit their exposure to hazard information. Likewise, preparedness campaigns tend to pay less attention to renters. Renters typically have lower incomes and fewer resources to prepare for natural disasters, and renters may lack the motivation to invest in mitigation measures for rented property.^{xiv}

As shown in Table 2.7 below, mobile homes represent 6.5% of Wilsonville’s housing units. Mobile homes tend to be less disaster resistant, and thus warrant special attention in the city’s risk assessment.

Table 2.7 Housing by Type, 2000

Housing Type	Total Structures	% of Structures
1-unit, detached	2,355	36.7%
1-unit, attached	674	10.5%
2 units	44	0.7%
3 or 4 units	359	5.6%
5 to 9 units	897	14%
10 to 19 units	770	12%
20 or more units	905	14.1%
Mobile home	415	6.5%
Boat, RV, van, etc.	0	0%
Total	6,419	100%

Source: US Census Bureau, 2000 Census^{xv}

2.5 Employment & Economics

Wilsonville was a farming community in the 1900s. Residents raised hops, field fruits, cattle and hogs on their farms. The city's proximity to the freeway and access to the rail has made it a desirable place for commercial and industrial development. The city's residents work in a variety of industries, with 'manufacturing' being the largest employment industry (see Table 2.8 below).

Wilsonville has an economic advantage due to its location at the north end of the Willamette Valley and its close 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., FOODesgin Machinery & Systems, Inc., FLIR Systems, Kinetics, Mentor Graphics, OrePac, Rite Aid Distribution Center, Rockwell Collins, Sysco Food Services and Xerox Corporation.

Table 2.8 Employment by Industry, 2000

Industry	Total Persons Employed	% of Population
Manufacturing	1,194	16
Educational, health and social services	1,133	15.2
Retail trade	888	11.9
Professional, scientific, management, administrative, and waste management services	880	11.8
Finance, insurance, real estate, and rental and leasing	657	8.8
Wholesale trade	632	8.5
Arts, entertainment, recreation, accommodation and food services	511	6.9
Construction	362	4.9
Transportation and warehousing, and utilities	300	4
Other services (except public administration)	299	4
Public administration	275	3.7
Information	243	3.3
Agriculture, forestry, fishing and hunting, and mining	77	1
Civilian employed population 16 years and over	7,451	100%

Source: US Census Bureau, 2000 Census^{xvi}

Median income can be used as an indicator of the strength of the community's stability. In 2000, the median household income in Wilsonville was \$52,515. Low-income residents may be more vulnerable to the impacts of natural hazard events, and may limit the community's ability to quickly recover after a natural disaster. According to the 2000 census, 3 % of families are considered to be below poverty status.

2.6 Transportation and Commuting Patterns

Transportation is an important consideration when planning for emergency service provisions. Growth within the city will put pressure on both major and minor roads, especially if the main mode of travel is by single occupancy vehicles. How people travel to work is indicative of the prevalence of single occupancy vehicle travel, and can help predict the amount of traffic congestion and the potential for accidents. Table 2.9 shows the different methods city residents use to travel to work.

Table 2.9 Transportation Mode Used to Commute to Work, 2000

Mode of Commute	Number of Commuters	% of Commuters
Car, truck, or van -- drove alone	5,850	79.4%
Car, truck, or van -- carpooled	845	11.5%
Worked at home	246	3.3%
Walked	195	2.6%
Public transportation (including taxicab)	155	2.1%
Other means	80	1.1%
Total	7,371	100%

Source: US Census Bureau, 2000 Census^{xvii}

South Metro Regional Transit (SMART) offers fixed-route services within the city and connecting service to the surrounding areas such as such as Canby, Salem and the south end of Portland.^{xviii} The Portland and Western Railroad (P&W) provides railroad service to Wilsonville customers. Additionally, Wilsonville’s Parks and Recreation, Bicycle and Pedestrian, and Transit Master Plans encourage neighborhood accessibility and walkability to parks, natural areas, schools and commercial areas.^{xix}

2.7 Community Assets

This section outlines the resources, facilities and infrastructure that if damaged could significantly impact public safety, economic conditions, and/or the environmental integrity of Wilsonville. A map of the community assets is located on page 26 below.

Critical Facilities: Those facilities and infrastructure necessary for emergency response efforts.

- City Hall/EOC
- Fire Station 52 (Kinsman Road – west side)
- Fire Station 56 (Elligsen Road – northeast)
- Public Works Building/Police Station/EOC #2
- Fleet Services Building
- Potential Shelter Sites
 - Wilsonville High School (east side)
 - Wood Middle School (west side)
 - Springridge Court at Charbonneau (southeast)

Critical Infrastructure: Infrastructure that provides services for the city

- Arterials (*designates road maintained by others)
 - I-5*
 - 95th Ave
 - Barber Street
 - Boeckman Road
 - Boones Ferry Road
 - Brown Road
 - Boberg Road
 - Canyon Creek Road

- Day Road*
- Elligsen Road
- 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
 - I-5/Willamette River Bridge
 - Wilsonville Road / Boeckman Creek Bridge
 - Boeckman Road Bridge
 - I-5 Wilsonville Road, Boeckman Road and Elligsen Road overpasses
- Waste Water Treatment Plant
- Water Treatment Plant
- Commuter Rail Station (WES); freight tracks
- Electric substations
- Pump stations
- Gas lines
- Power lines
- Reservoirs
- Communications towers (Elligsen, Pioneer Court, Villebois)
- High pressure gas line
- High pressure fuel line
- City wells

Essential Facilities: Those facilities and infrastructure that supplement response efforts.

- Schools
 - Boeckman Creek Primary School
 - Boones Ferry Primary School
 - Inza R. Wood Middle School
 - Wilsonville High School
 - Arts and Technology High School (Art Tech High)
 - Mentor Graphics Child Development Center (Kindergarten)
 - Northwest Montessori School (Pre-school and Kindergarten)
 - Pacific Northwest Academy (Elementary)
 - WLWV at Town Center (Pre-school to 7th grade)
 - Learning Tree Pre-school (pre-school to 4th grade)
 - Pioneer Pacific College
 - Clackamas Community College

- New primary school at Villebois (under construction)
- Library
- Community Center
- Providence Medical Facility
- Coffee Creek Correctional Facility
- Allied Waste Services
- SMART Transit Facility (WES Commuter Rail Site)
- Food providers
 - Sysco
 - Costco
 - Lambs Thriftway
 - Albertsons
 - Target
- Pharmacies
 - Rite Aid distribution center
 - McKesson HBOC distribution center
 - Albertsons
 - Costco
 - Rite Aid
 - Target
- Walgreens

Vulnerable Populations: Locations serving populations that have special needs or require special consideration.

- Schools
- Day care facilities (Laurel will look these up)
- Canyon Creek Correctional Facility
- Senior Care Facilities
 - Avalon Adult Center
 - Creekside Woods
 - Marquis Care at Wilsonville
 - Springridge Court at Charbonneau (Alzheimer Units)
 - The Wilsonville (Alzheimer Units)
 - Windfield Village
- Charleston at Villebois
- Rainwater Gardens at Villebois
- Renaissance at Villebois

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

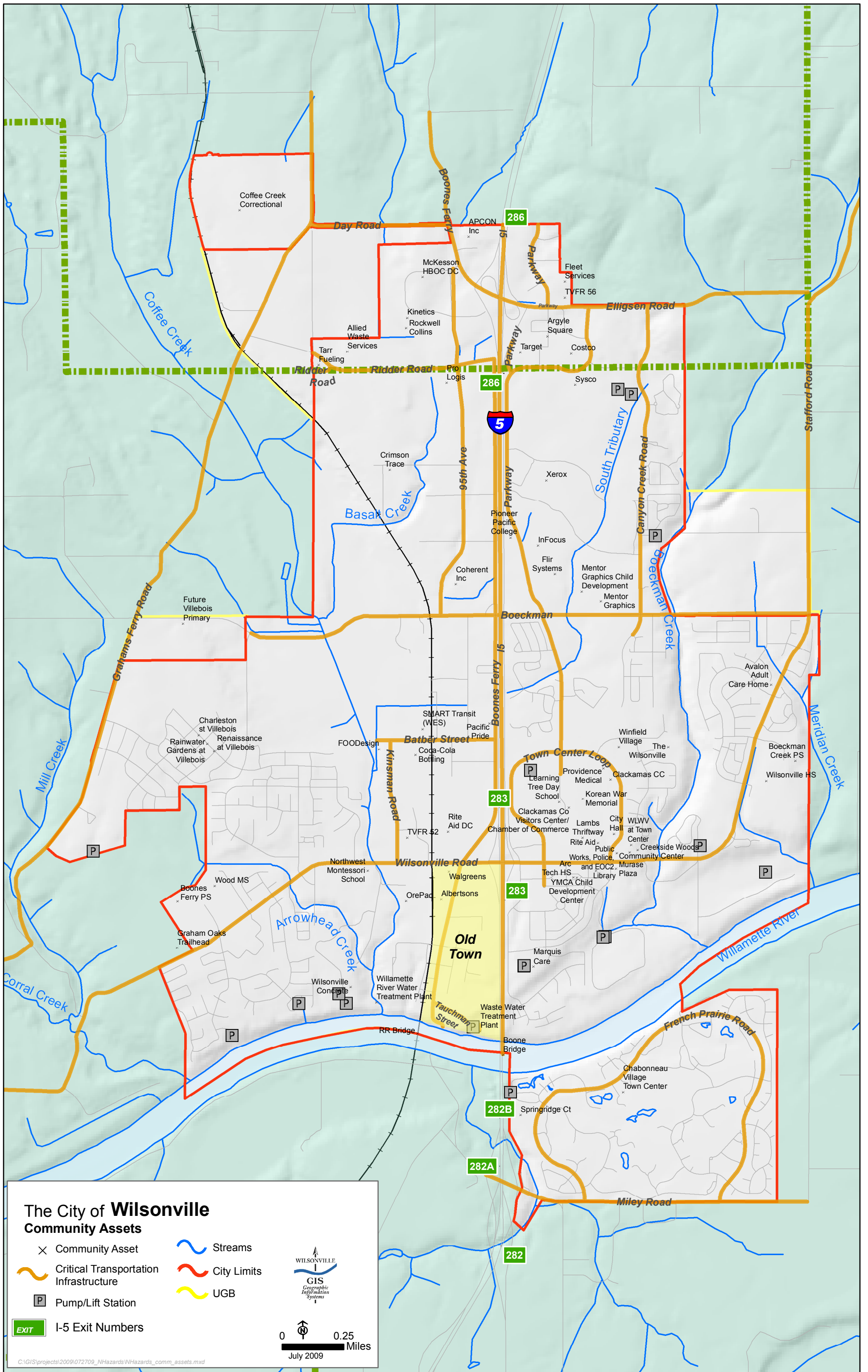
- Wilsonville Chamber of Commerce
- Allied Waste Management

- Argyle Square
- APCON, Inc
- Charbonneau Village Town Center
- Coca-Cola Bottling of Oregon
- Coherent
- Crimson Trace Corporation
- FOODesign Machinery and Systems, Inc
- FLIR Systems
- Kinetics
- Mentor Graphics
- OrePac
- Pacific Pride
- Prologic
- Rite Aid Distribution Center
- Rockwell Collins
- Sysco Food Services of Portland, Inc
- Tarr fueling
- Xerox Corporation
- Wilsonville Concrete

Environmental Assets: Environmental assets are those parks, green spaces, wetlands, and rivers that provide an aesthetic and functional service for the community.

- Willamette River
- Arrowhead Creek
- Basalt Creek
- Boeckman Creek
- Canyon Creek
- Coffee Creek
- Meridian Creek
- Coffee Lake Wetlands
- Canyon Creek Park
- Boones Ferry Park
- Courtside Park
- Hathaway Park
- Memorial Park
- Merryfield Park
- River Fox Park
- Town Center Park
- Tranquil Park
- Villebois Park System
- Willamette River Water Treatment Plant Park
- Willow Creek Landover Park
- South Tributary
- Community Garden

- Graham Oaks Natural Area
- Boeckman Creek Crossing Trail
- Charbonneau
- Golf Course



2.8 Historic & Cultural Resources

Historic and cultural resources such as historic structures and landmarks can help to define a community and may also be sources of tourism dollars. Protecting these resources from the impact of disasters is important. Historic and cultural resources in Wilsonville include the Magness Memorial Tree Farm, Memorial Park, Graham Oaks Nature Park and Trailhead, Fir Point Farm, Town Center Park, Boones Ferry Park, Murase Plaza, the Oregon Korean War Memorial, Clackamas County Visitors Center, CREST Environmental Learning Center, and the annual Wilsonville Festival of Arts and Parade featuring the work of local and regional artists, poetry readings, story-telling, music and dance performances. The historic buildings in Old Town include Aden's Store, Cottage Hotel, Norris Machine, Old Bank, Old Feed Store, Old Methodist Church, Old Town Village, Old Train Station, Saint Cyril's, Stein-Boozier Barn, and the Tauchman House.

2.9 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.

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 Department:** Includes Building, Planning, Engineering, Natural Resources, and Urban Renewal. The Department manages development and capital improvement projects within the city and produces the strategic vision of the city.
- **Community Services:** Responsible for providing programs and services for community youth and seniors.
- **GIS:** Provides mapping and data analysis services to City departments.
- **Public Works:** Responsible for maintaining streets, street lights, water distribution, sewer collections, storm water system and managing the Willamette River Water Treatment Plant and Wastewater Treatment Plant along with maintaining 12 public parks totaling 235 acres and the preservation of open spaces, trees, creeks, wetlands and habitat areas.
- **Public Safety:** Consists of the Municipal Court, Wilsonville Police (provided via contract with Clackamas County Sheriff's Office) and Tualatin Valley Fire and Rescue, a direct-taxing special services district that provides fire, EMS first response, rescue, and hazardous materials response, along with fire prevention and public education services to enhance the health and safety of Wilsonville

residents. In addition, Wilsonville is served by two private ambulance services, providing emergency (9-1-1) and non-emergency medical response and transport. Metro West Ambulance serves the portion of Wilsonville in Washington County, and American Medical Response (AMR) serves the Clackamas County portion.

2.10 Existing Plans & Policies

Communities often have existing plans and policies that guide and influence land use, land development, and population growth. Such existing plans and policies can include comprehensive plans, zoning ordinances, and technical reports or studies. Plans and policies already in existence have support from local residents, businesses and policy makers. Many land-use, comprehensive, and strategic plans get updated regularly, and can easily adapt to changing conditions and needs.^{xx}

Wilsonville's Addendum to the Clackamas County Natural Hazards Mitigation Plan includes a range of recommended action items that, when implemented, will reduce the city's vulnerability to natural hazards (see Section 4 below). Many of these recommendations are consistent with the goals and objectives of the city's existing plans and policies. To the extent possible, Wilsonville will work to incorporate the recommended mitigation action items into existing plans, programs and policies. Linking existing plans and policies to the mitigation plan helps identify existing city resources that can be used to implement the plan's action items. Likewise implementing the mitigation plan's action items through existing plans and policies increases their likelihood of being supported and getting updated, and maximizes the city's resources.

The following are Wilsonville's existing plans and policies (specifically, those that directly relate to natural hazards mitigation):

Policy: Bicycle and Pedestrian Master Plan

Date of Adoption: 2006

Author/Owner: City of Wilsonville

Description: To promote non-motorized travel and a safe interconnected system of pedestrian and bicycle facilities.

Relation to Natural Hazard Mitigation: Mitigation actions related to improving transportation facilities should be linked with goals and policies found in the Bicycle and Pedestrian Master Plan. Likewise, mitigation activities that relate to bicycle or pedestrian facilities should be tied to and/or integrated within the Bicycle and Pedestrian Master Plan.

Plan: Wilsonville Comprehensive Plan

Date of Last Revision: updated in 2004

Author/Owner: City of Wilsonville

Description: A statement of goals, policies and implementation measures for the development of the city.

Relation to Natural Hazard Mitigation: Information within the natural hazards mitigation plan should be referenced in the Comprehensive Plan. Likewise, any mitigation actions related to land use/development should be implemented through the Comprehensive Plan.

Policy: Transportation Systems Plan

Date of Adoption: 2003

Author/Owner: City of Wilsonville

Description: Contains policies and implementation measures designed to fulfill the city's transportation needs.

Relation to Natural Hazard Mitigation: Mitigation actions related to improving transportation facilities should be linked with goals and policies found in the Transportation System Plan. Likewise, any mitigation actions related to land use/development should be implemented through the Transportation System Plan.

Policy: Natural Resources Annexation Policy

Date of Adoption: July 16, 2007

Author/Owner: City of Wilsonville

Description: The intent of the policy is to encourage property owners interested in petitioning the city for annexation to preserve and protect significant natural resources and trees prior to annexation in a manner consistent with the City of Wilsonville Development Code.

Relation to Natural Hazard Mitigation: Through the application of consistent and equitable guidelines within the city limits and in future annexation areas, the preservation of significant natural resources and trees for existing and future residents is facilitated.

Policy: Water System Master Plan

Date of Adoption: 2002

Author/Owner: City of Wilsonville

Description: The Water System Master Plan provides the city with a comprehensive planning document that presents detailed water system information, engineering assessment, and planning guidance necessary for the successful management and operation of the city's water system.

Relation to Natural Hazard Mitigation: Mitigation actions related to drought or flooding may be addressed within the water system master plan. Likewise, structural improvement projects related to water system infrastructure should be tied to the water system master plan (or capital improvements plan).

Plan: Wilsonville Development Code

Date of Last Revision: January 2009

Author/Owner: City of Wilsonville

Description: The purpose of the Development Code is to set rules and regulations on construction and activities within the city.

Relation to Natural Hazard Mitigation:

- Section 4.139 The Significant Resource Overlay Zone (SROZ): regulates uses and activities that could impact locally significant wetlands, riparian corridors, and upland wildlife habitat. The SROZ maintains the long-term viability of these natural resources by reducing the impacts of development, which may include grading, filling, paving, tree or vegetation removal and the construction of buildings or other structures.

- Section 4.171 General Regulations – Protection of Natural Features and Other Resources: prescribes standards and procedures for the use and development of land to assure the protection of valued natural features and cultural resources.
- Section 4.172 Flood Plain Regulations: minimizes public and private losses due to flood conditions in flood-prone areas; regulates uses and alteration of land which would otherwise cause erosion, decreased storm water storage capability, increased flood heights or velocities; requires that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction, alteration or remodeling; restricts filling, grading, dredging, and other development which would increase flood damage; prevents construction of flood barriers which would unnaturally divert flood waters or increase flood hazards in other areas; properly regulates the 100-year flood plain identified by the Federal Insurance Administration; implements the policies of the Comprehensive Plan and to provide standards consistent with Wilsonville’s adopted Storm Drainage Master Plan; and to insure the city and its residents and businesses continued eligibility in the National Flood Insurance Program.
- Section 4.176 Landscaping, Screening, and Buffering: consists of landscaping and screening standards and regulations for use throughout the city. The regulations address materials, placement, layout, and timing of installation. The city recognizes the ecological and economic value of landscaping and requires the use of landscaping and other screening or buffering to satisfy standards including promote erosion and flood control.
- Section 4.320 Underground Utilities Requirements: the developer or subdivider shall be responsible for and make all necessary arrangements with the servicing utility to provide the underground services.
- Section 4.500 Willamette River Greenway: the purpose is to protect, conserve, enhance and maintain the natural, scenic, historical, agricultural, economic and recreational qualities of lands along the Willamette River as the Willamette River Greenway.
- Section 4.600 Tree Preservation and Protection: preserves Significant Resource Overlay Zone areas, recognizing that development can and will occur; provides for the protection, preservation, proper maintenance and use of trees and woodlands in order to protect natural habitat and prevent erosion; to protect trees and other wooded areas for their economic contribution to local property values when preserved, and for their natural beauty and ecological or historical significance; protects water quality, control surface water run-off, and protect ground water recharge; reflects the public concern for these natural resources in the interest of health, safety and general welfare of Wilsonville residents; and encourages planting where trees are removed.

Section 3: Risk Assessment

The following hazards have been addressed in the Clackamas County Natural Hazards Mitigation Plan. The City of Wilsonville reviewed the county's plan on May 29, 2009 and assessed how Wilsonville's risks vary from the risks facing the entire planning area.

3.1 Flood

The Clackamas County Multi-Jurisdictional Natural Hazards Mitigation Plan adequately describes the causes and characteristics, history, and general impacts of the flooding hazard in the City of Wilsonville. Descriptions of the flood hazard can be found on pages 6-1 to 6-22 of the 2002 Clackamas County Natural Hazards Mitigation Plan and pages 25 to 29 of the 2007 update.

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 a number of backed-up creeks. Overall, however, the worst flooding damages in 1996 occurred along the Willamette River. Portions of Memorial Park flooded but the sewer lift station continued in service 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.

In 2008, 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 on the first floor.

The City of Wilsonville has one river and a number of smaller tributaries that are susceptible to flooding events. These include the Willamette River, Coffee Creek, Basalt Creek, Boeckman Creek, Meridian Creek, Arrowhead Creek, Corral Creek, and South Tributary. 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.

The Floodplains Map on page 30 below illustrates the flood hazard area for Wilsonville, which covers 390 acres including open water. 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. Potentially impacted community assets include one pump station, and fewer than five homes. The geographic location of the flooding hazard

was determined using the designated FEMA NFIP 100-year floodplain data, as well as the inundation line for the 1996 flood.

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. The map also 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.

The HMAC estimates that the probability of future flooding events in Wilsonville is 'high,' meaning one event is likely to occur within a 10 to 35 year period. This estimate is in agreement with the county's 'high' probability estimate. The HMAC estimates the city's vulnerability to flooding events is 'low' meaning less than 1% of the city's population and/or assets could be affected in a major flood event. The vulnerability is lower than the county's 'moderate' ranking. The 1996 flood is the worst flood on record for Wilsonville and far less than 1% of the population and assets were affected.

The City of Wilsonville employs a number of mitigation strategies to reduce the city's risk to flood events. The city development code includes a number of policies and regulations for flood prone areas including the Significant Resource Overlay Zone, Flood Plain Regulations, Protection of Natural Features and Other Resources, and Willamette River Greenway (see section 2.10 above for more details). Development review practices and conditions of development require developers to account for 100% of 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 a number of 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 is scheduled for relocation to avoid flooding in the future.

Wilsonville is a regular participant in the National Flood Insurance Program with 31 policies in force at a value of \$9,255,800. The city has had a total of 5 losses, three of which have been closed. Total payments on these losses amount to \$73,826.18. Wilsonville has had 0 repetitive loss properties. The city's most current effective Flood Insurance Rate Map (FIRM) date is June 17, 2008 (initial FHBM 3/29/1974), and the most recent Community Assistance Visit was January 14, 2009. Wilsonville is not a participant in the Community Rating System (CRS).^{xxi}



3.2 Landslide

The Clackamas County Multi-Jurisdictional Natural Hazards Mitigation Plan adequately describes the causes and characteristics, location, extent and potential impacts of landslides in the region. Descriptions of the landslide hazard can be found on pages 7-1 to 7-13 of the 2002 Clackamas County Natural Hazards Mitigation Plan and pages 33 to 39 of the 2007 update.

Wilsonville does not have a history of landslides. This is due to a primary and secondary open space ordinance that went into effect in 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. Several neighborhoods have been built near these slopes including Day Dream River Estates, Rivergreen, Morey's Landing, River Village Mobile Home Park, Kalyca Terrace, Buck's Landing, Montgomery, Edgewater, and Charbonneau. Bridgecreek and Courtside Estates apartments are built near Canyon Creek.

The HMAC estimates the probability of future landslide events is 'low,' meaning one event is likely to occur within a 75 to 100 year period. This estimate is lower than the county's 'high' probability estimate because the city has no history of landslides and there are very few areas at risk to landslides. The city's progressive thinking when the city was developing in the 1970s has protected it from potential landslide hazards. The HMAC estimates a 'low' vulnerability to landslides, meaning less than 1% of population and/or assets could be affected by landslide event. This is in agreement with the county's 'low' ranking.

Wilsonville works to mitigate future landslide hazards. The city development code includes a number of 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 (see section 2.10 above for more details). A tree protection 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 as a result of improper drainage.

In 2008, Wilsonville completed the Rivergreen Stormwater Outfall project which addressed runoff and groundwater 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.

3.3 Wildfire

The Clackamas County Multi-Jurisdictional Natural Hazards Mitigation Plan adequately describes the causes and characteristics, location, extent and impacts of the wildfire hazard in City of Wilsonville. Descriptions of the wildfire hazard can be found on pages 8-1 to 8-16 of the 2002 Clackamas County plan. The Clackamas County Community Wildfire Protection Plan details a limited history of wildfire in the county. In 1951 approximately 2,000 acres burned in Clackamas and Multnomah Counties. In 2001 lightning strikes started eight fires in eastern Clackamas County on US Forestry Service lands, burning about 80 acres. In 2002 the Bowl Fire burned over 300 acres just east of Estacada, located approximately 20 miles east of Wilsonville.^{xxii}

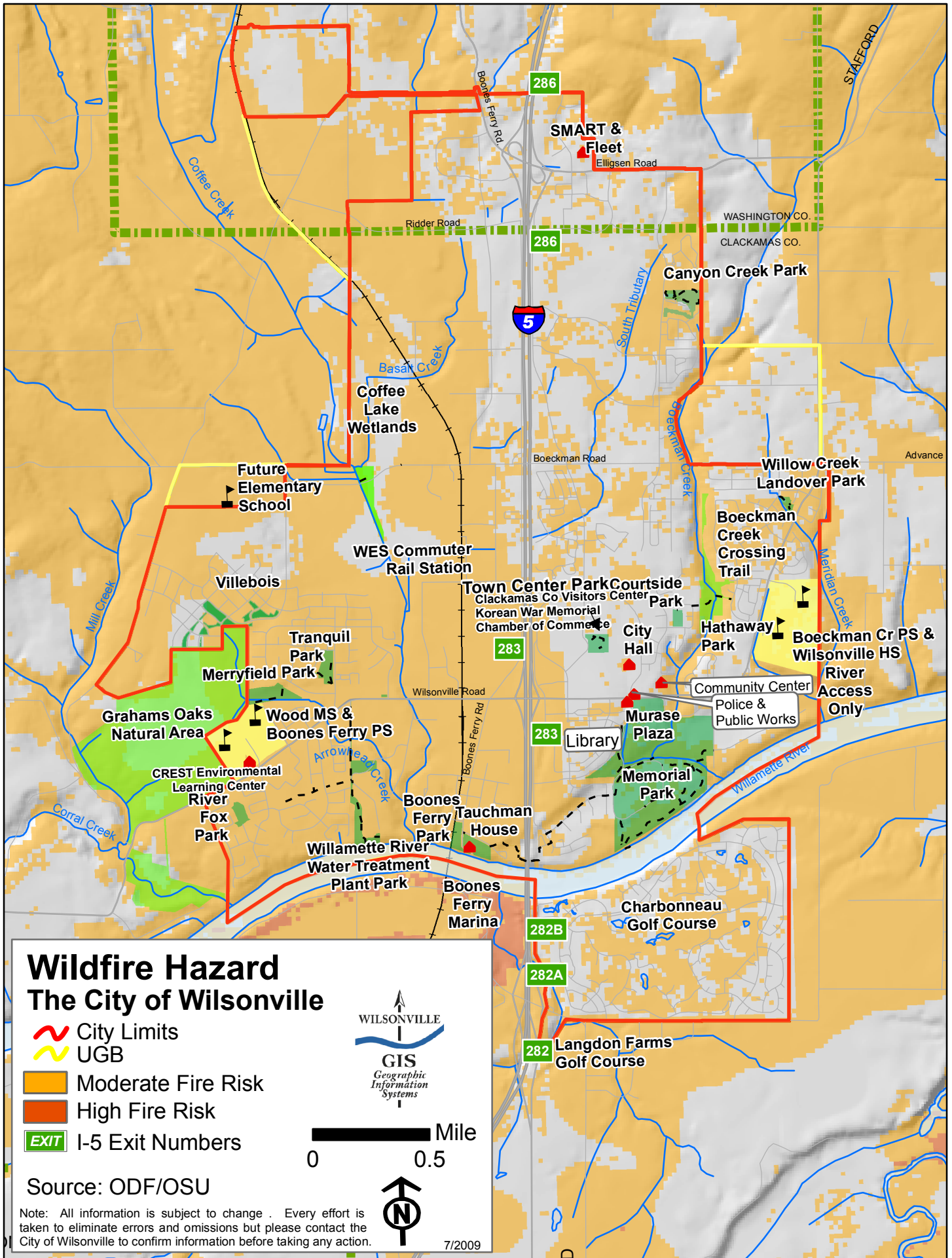
Clackamas County has two major physiographic regions: the Willamette River Valley in western Clackamas County and the Cascade Range Mountains in eastern and southern Clackamas County. The Willamette River Valley, which includes Wilsonville, is the most heavily populated portion of the county and is characterized 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 forested land. Human caused fires are responsible for the majority of fires in Clackamas County. In Wilsonville most instances of fire have been started by the rail roads and I-5 but the fires have been small enough to contain quickly and easily. A small fire started at Cedar Way, for example, and spread to the end of Montgomery Way. A homeowner on Cedar Way was doing back burning and went on vacation when east winds blew the fire out of containment. The area was difficult to access but fire crews were able to suppress the fire before major damages occurred.

Some areas within Wilsonville have dense vegetation coverage 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. The wildfire hazard map, below on page 34, identifies approximately 1,500 acres at moderate risk to wildfires. The map indicates the wildfire hazard covers much of the city, but the areas west of Interstate 5 have greater concentrations of moderate fire risk. There are no areas within the city at high risk.

The HMAC estimates the probability of future wildfire events is ‘moderate,’ meaning one event is likely within a 35 to 75 year period. Vulnerability is also ‘moderate,’ meaning between 1% and 10% of the population or community assets would be affected by a major wildfire event. Both rankings are in agreement with the county’s ‘moderate’ probability and vulnerability ratings.

Wilsonville uses a number of 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.



3.4 Severe Storms: Wind and Winter

The Clackamas County Multi-Jurisdictional Natural Hazards Mitigation Plan adequately describes the causes and characteristics, history, location, extent and impacts of the severe storm hazard in the City of Wilsonville. Severe storm information can be found on pages 9-1 to 10-7 of the 2002 Clackamas County Natural Hazards Mitigation Plan, and pages 46 to 50 in the 2007 plan update.

The biggest impact of severe 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.

Mitigating severe storms 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.

The HMAC estimates that the probability of severe wind and winter storm events is 'high,' meaning one event is likely within a 10 to 35 year period. This estimate is the same as the county's 'high' winter storm probability estimate, but higher than the county's 'moderate' wind storm estimate. The history of wind storms in Wilsonville shows that they occur frequently enough to warrant the 'high' probability rating. The HMAC estimates a 'moderate' vulnerability to winter storms and 'low' vulnerability to wind storms. These ratings are in agreement with the county's 'moderate' severe storm vulnerability ratings.

3.5 Earthquake

Clackamas County's Natural Hazards Mitigation Plan adequately describes the causes and characteristics of earthquake hazards for the region. Likewise, the county's plan adequately documents past earthquake occurrences. Historical records count over 56 earthquakes in the Portland area. The more severe earthquakes 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. Descriptions of the earthquake hazard can be found on pages 11-1 to 11-20 in the 2002 Clackamas County Natural Hazards Mitigation Plan, and pages 53 to 58 in the 2007 plan update.

Within the Northern Willamette Valley/Portland Metro Region, three potential faults and/or zones are capable of generating high-magnitude earthquakes. These include the Portland Hills Fault Zone, Gales Creek-Newberg-Mt. Angel Structural Zone, and the Cascadia Subduction Zone.

- 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.^{xxiii} The fault zone extends along the eastern margin of the Portland Hills for a distance of 25 miles, and lies about 11 miles northeast of Wilsonville.
- Gales Creek-Newberg-Mount Angel Structural Zone
The Gales Creek-Newberg-Mount Angel Structural Zone is a 50-mile-long zone of discontinuous NW trending faults that lies about 9 miles southwest of Wilsonville. These faults are recognized in the subsurface by vertical separation of the Columbia River Basalt and offset seismic reflectors in the overlying basin sediment.^{xxiv}
- 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.^{xxv} Scientists have recently 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.^{xxvi}

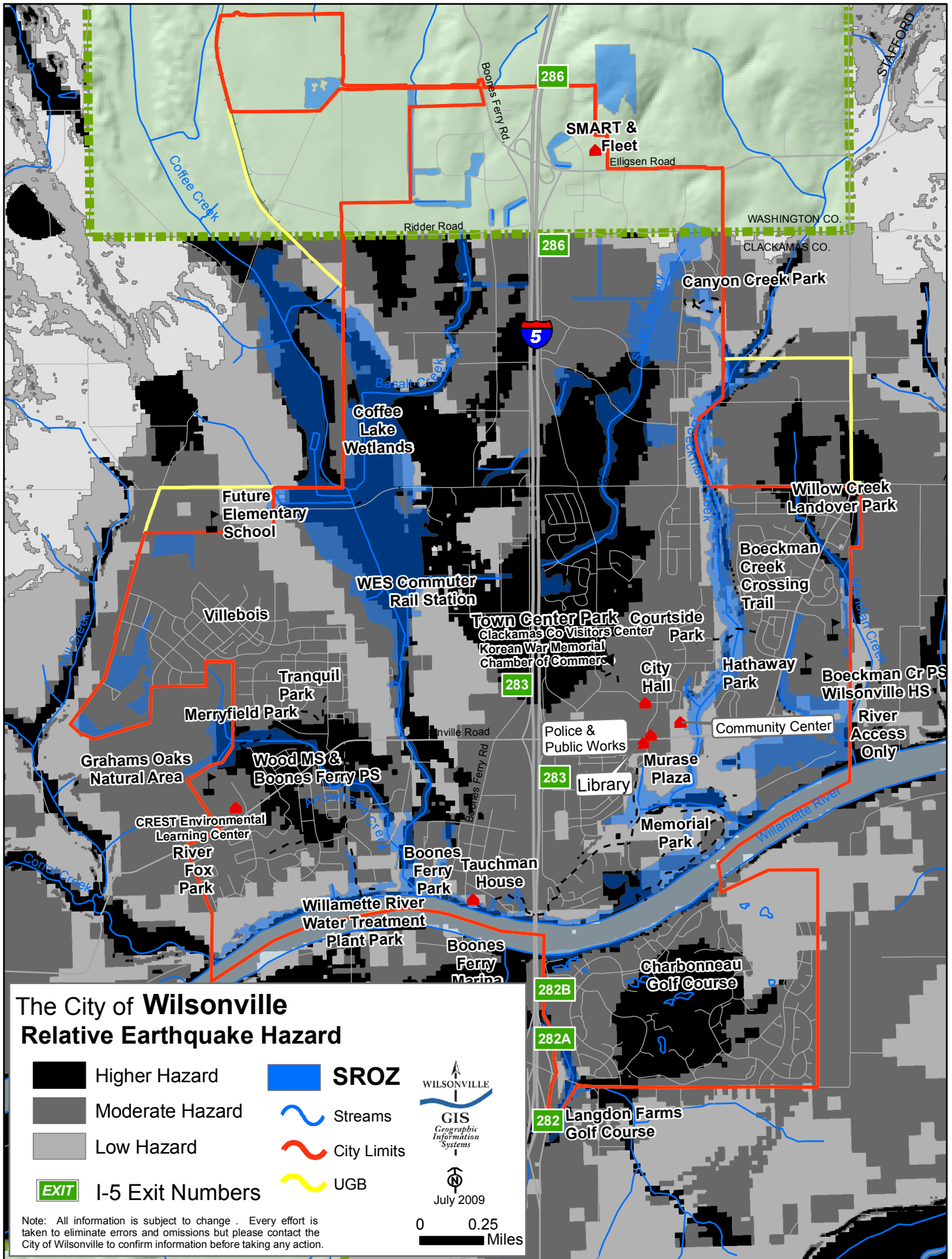
The Relative Earthquake Hazard map, located below on page 38, shows areas of high, moderate, and low earthquake hazard within the City of Wilsonville. The largest high earthquake hazard area is located in the center of the city. Community assets in this area include Flir Systems, FOODesign Machinery & Systems, Inc., Pacific Pride, WES commuter rail station, Mentor Graphics Child Development Center, and a pump/lift station. Another large high earthquake hazard area is located within Charbonneau and

includes the Charbonneau Village Town Center. The final community asset located within a high earthquake hazard zone is Wood Middle School.

In 2007, the Department of Geology and Mineral Industries (DOGAMI) released the results of the Statewide Seismic Needs Assessment, which evaluated the collapse potential of education and emergency services buildings. The study found the Inza R. Wood Middle School has a ‘high’ (>10%) collapse potential, and one Clackamas County Community College building has a ‘very high’ (100%) collapse potential.^{xxvii} Please see Clackamas County’s Natural Hazards Mitigation Plan for additional information regarding potential earthquake-related impacts. 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 I-5 / Willamette River Bridge that provides access to Charbonneau has had seismic retrofit work done, but this does not guarantee use in a large event.

The SEOC ranks the probability of future earthquake events as ‘low,’ meaning one event is likely within a 75 to 100 year period. This estimate is the lower than the county’s ‘high’ probability estimate. The 2007 Clackamas County Natural Hazards Mitigation Plan determined the high probability ranking by looking at earthquakes over 4.0M. In the last 150 years there have been 16 events over 4.0M, but many of these earthquakes did not cause damage. The HMAC instead decided to focus only on the probability of highly damaging earthquakes, which have a much lower probability than magnitude 4.0 earthquakes (or lower). Paleoseismic studies along the Oregon coast indicate that the state has experienced seven Cascadia Subduction Zone (CSZ) events possibly as large as M9 in the last 3,500 years. These events are estimated to have an average recurrence interval between 500 and 600 years, although the time interval between individual events ranges from 150 to 1000 years. Since Clackamas County’s Natural Hazards Mitigation Plan was updated in 2007, better earthquake probability estimates have surfaced. Scientists now estimate that the chance in the next 50 years of a great subduction zone earthquake is between 10 and 20 percent assuming that the recurrence is on the order of 400±200 years.^{xxviii} Crustal and deep intraplate earthquakes remain difficult to predict.

The HMAC ranked the vulnerability to earthquakes as ‘high,’ meaning more than 10% of the population and assets would likely be affected in a major event. This is in agreement with the county’s ‘high’ vulnerability estimate. Wilsonville has taken mitigation steps to reduce the city’s vulnerability in earthquake events. City Hall and the water treatment plant were built according to the most recent building code standards. Additionally, Tualatin Valley Fire & Rescue is planning to rebuild Station 56 (Elligsen Road) in approximately 2011, and Station 52 (Kinsman Road), a newer facility, will receive minor seismic upgrades at some point after that. In recent years ODOT has seismically upgraded Boone Bridge, but specifics on this project are not known.



The City of Wilsonville Relative Earthquake Hazard

- Higher Hazard
- Moderate Hazard
- Low Hazard
- EXIT I-5 Exit Numbers
- SROZ**
- Streams
- City Limits
- UGB



July 2009

0 0.25 Miles

Note: All information is subject to change. Every effort is taken to eliminate errors and omissions but please contact the City of Wilsonville to confirm information before taking any action.

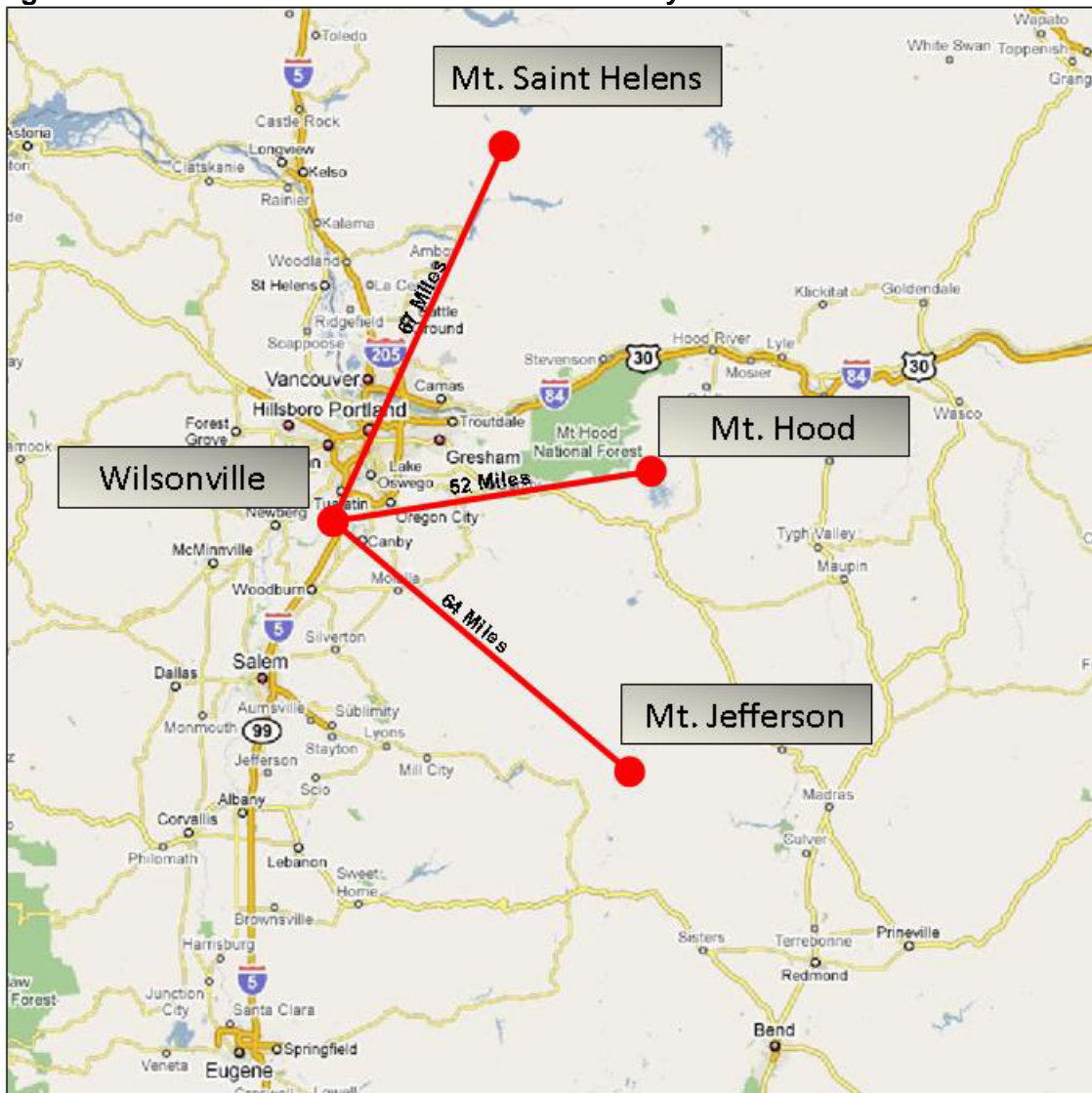
3.6 Volcano

The Clackamas County Multi-Jurisdictional Natural Hazards Mitigation Plan adequately describes the causes and characteristics, history, location, extent and impacts of volcanic eruptions affecting the City of Wilsonville. Descriptions of the volcano hazard can be found on pages 12-1 to 12-13 of the 2002 Clackamas County Natural Hazards Mitigation Plan and pages 61 to 64 of the 2007 plan update.

Immediate danger areas for volcanic eruptions lie within a 20-mile radius of the blast site, and ashfall is likely to affect communities downwind of the eruption. Several volcanoes are located near Wilsonville, the closest of which are shown in Figure 3 below.

Additionally, Mount Adams is located north of Mount Hood; Mount Rainier is located north of Mount Saint Helens; and the Three Sisters lie to the south of Mount Jefferson.

Figure 3: Volcano Locations in Relation to the City of Wilsonville



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 is likely to be fully coated in ash.

Clackamas County estimates a low probability that volcanic eruptions will occur in the future, and a high vulnerability to volcanic events. Both ratings are true for the city of Wilsonville as well. Hazards related to volcanic eruptions (i.e., potential community impacts) are adequately described in the Clackamas County Natural Hazards Mitigation Plan. Although the City of Wilsonville is unlikely to experience lahars or lava flows, tephra (sand-sized or finer particles of volcanic rock that is ejected rapidly into the air from volcanic vents) drifts downwind from the explosions and can form a blanket-like deposit of ash. Tephra is a public health threat, and can damage agriculture and transportation systems (i.e., aircraft and on-the-ground vehicles). Tephra can also clog drainage systems and create major debris management problems. Within Wilsonville, public health would be a primary concern, and keeping transportation routes open/accessible would be important as well.

Section 4: Action Items

4.1 Action Items

Short and long-term action items identified through the planning process are an important part of the mitigation plan. Action items are detailed recommendations for activities that local departments, citizens and others could engage in to reduce risk. Each action item has a corresponding action item worksheet describing the activity, the project's rationale, potential ideas for implementation, and coordinating / partner organizations. The action item worksheets can assist the community in pre-packaging potential projects for grant funding. Full action item worksheets are located in Appendix B of this addendum.

- MH #1: Develop public education programs to inform the public about methods for mitigating the impacts of natural hazards.
- MH #2: Integrate the goals and action items from the Natural Hazards Mitigation Plan into existing regulatory documents and programs, where appropriate.
- MH #3: Identify and pursue funding opportunities to develop and implement hazard mitigation activities.
- MH #4: Continue to update and improve hazard assessments in the Natural Hazards Mitigation Plan as new information becomes available.
- MH #5: Implement the recommendations identified in the Natural Hazards Report.
- MH #6: Continue vegetation management throughout the city.
- MH #7: Encourage structural mitigation practices in developments at risk to hazards.
- FL #1: Ensure continued compliance in the National Flood Insurance Program (NFIP) through enforcement of local floodplain management ordinances.
- FL #2: Coordinate with the Oregon Department of Transportation (ODOT) to increase the capacity of culverts.
- FL #3: Implement the recommendations found in the Stormwater Master Plan.
- SS #1: Reduce negative effects from severe windstorm and severe winter storm events.
- EQ #1: Conduct seismic evaluations of the Wastewater Treatment Plant, Community Center, and Public Works/Police Building for implementing appropriate structural mitigation strategies.

- EQ#2: Seismically retrofit Elligsen Road Fire Station and associated structures.
- EQ#3: Perform non structural mitigation on public facilities to improve life safety standards.

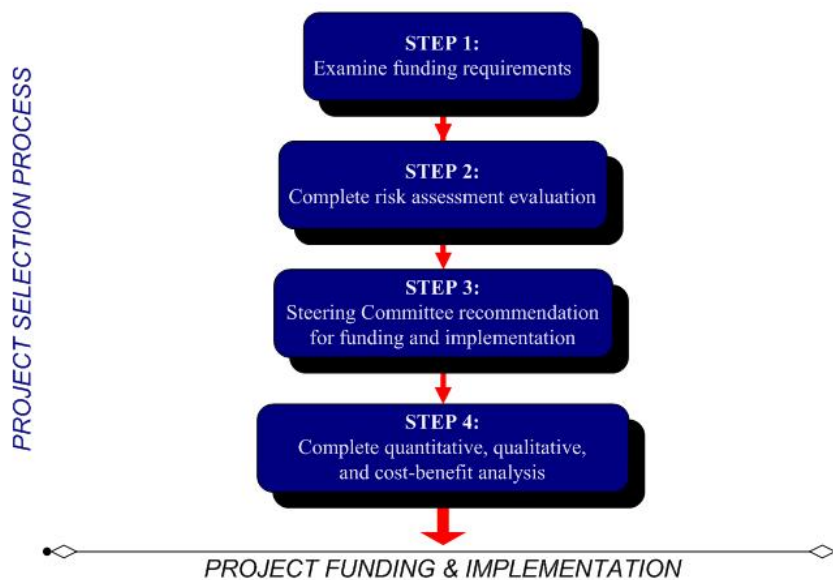
Note: the City of Wilsonville does not believe that implementing landslide and volcano-related mitigation activities will be cost-effective at this time. As such, the city has not identified volcanic-eruption mitigation action items. Wilsonville will partner with Clackamas County, however, on the implementation of mitigation strategies that benefit both jurisdictions.

4.2 Project Prioritization Process

The Disaster Mitigation Act of 2000 (via the Pre-Disaster Mitigation Program) requires that jurisdictions identify a process for prioritizing potential actions. Potential mitigation activities often come from a variety of sources; therefore the project prioritization process needs to be flexible. Projects may be identified by committee members, local government staff, other planning documents, or the risk assessment. Figure 4 illustrates the project prioritization process.

Figure 4: Project Prioritization Process

Action Item and Project Review Process



Source: Community Service Center's Partnership for Disaster Resilience at the University of Oregon, 2008.

Step 1: Examine funding requirements

The first step in prioritizing the plan's action items is to determine which funding sources are open for application. Several funding sources may be appropriate for the city's proposed mitigation projects. Examples of mitigation funding sources include but are not limited to: FEMA's Pre-Disaster Mitigation competitive grant program (PDM), Flood

Mitigation Assistance (FMA) program, Hazard Mitigation Grant Program (HMGP), National Fire Plan (NFP), Community Development Block Grants (CDBG), local general funds, and private foundations, among others.

Because grant programs open and close on differing schedules, the HMAC will examine upcoming funding streams' requirements to determine which mitigation activities would be eligible. The HMAC may consult with the funding entity, Oregon Emergency Management, or other appropriate state or regional organizations about project eligibility requirements. This examination of funding sources and requirements will happen during the HMAC's semi-annual plan maintenance meetings.

Step 2: Complete risk assessment evaluation

The second step in prioritizing the plan's action items is to examine which hazards the selected actions are associated with and where these hazards rank in terms of community risk. The HMAC will determine whether or not the plan's risk assessment supports the implementation of eligible mitigation activities. This determination will be based on the location of the potential activities, their proximity to known hazard areas, and whether community assets are at risk. The HMAC will additionally consider whether the selected actions mitigate hazards that are likely to occur in the future, or are likely to result in severe / catastrophic damages.

Step 3: Committee Recommendation

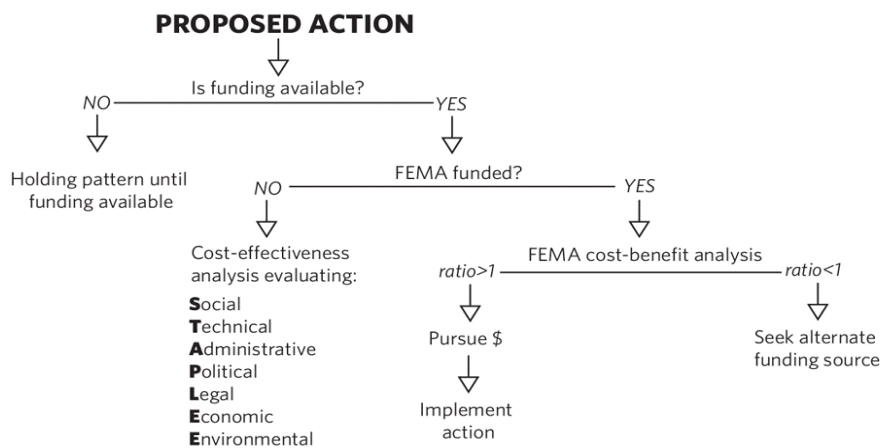
Based on the steps above, the HMAC will recommend which mitigation activities should be moved forward. If the HMAC decides to move forward with an action, the coordinating organization designated on the action item form will be responsible for taking further action and, if applicable, documenting success upon project completion. The HMAC will convene a meeting to review the issues surrounding grant applications and to share knowledge and/or resources. This process will afford greater coordination and less competition for limited funds.

The HMAC and the community's leadership have the option to implement any of the action items at any time, (regardless of the prioritized order). This allows the HMAC to consider mitigation strategies as new opportunities arise, such as funding for action items that may not be of the highest priority. This methodology is used by the HMAC to prioritize the addendum's action items during the annual review and update process.

Step 4: Complete quantitative and qualitative assessment, and economic analysis

The fourth step is to identify the costs and benefits associated with the selected natural hazard mitigation strategies, measures or projects. Two categories of analysis that are used in this step are: (1) benefit/cost analysis, and (2) cost-effectiveness analysis. Conducting benefit/cost analysis for a mitigation activity assists in determining whether a project is worth undertaking now, in order to avoid disaster-related damages later. Cost-effectiveness analysis evaluates how best to spend a given amount of money to achieve a specific goal. Determining the economic feasibility of mitigating natural hazards provides decision makers with an understanding of the potential benefits and costs of an activity, as well as a basis upon which to compare alternative projects. Figure 5 shows decision criteria for selecting the appropriate method of analysis.

Figure 5: Benefit Cost Decision Criteria



Source: Community Service Center's Partnership for Disaster Resilience at the University of Oregon, 2006.

If the activity requires federal funding for a structural project, the committee will use a Federal Emergency Management Agency-approved cost-benefit analysis tool to evaluate the appropriateness of the activity. A project must have a benefit/cost ratio of greater than one in order to be eligible for FEMA grant funding.

For non-federally funded or nonstructural projects, a qualitative assessment will be completed to determine the project's cost effectiveness. The committee will use a multivariable assessment technique called STAPLE/E to prioritize these actions. STAPLE/E stands for Social, Technical, Administrative, Political, Legal, Economic, and Environmental. Assessing projects based upon these seven variables can help define a project's qualitative cost effectiveness.

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- i USGS - Partnership for Disaster Resilience Research Collaborative, 2006.
- ii National Institute of Building Science's Multi-hazard Mitigation Council. "Natural Hazard Mitigation Saves: An Independent Study to Assess the Future Savings from Mitigation Activities" 2005.
- iii USGS - Partnership for Disaster Resilience Research Collaborative, 2006.
- iv Weatherbase.com, "Salem Oregon," <http://www.weatherbase.com>, accessed July 10, 2009.
- v Ibid.
- vi Portland State University Population Research Center, "Certified 2000-2008 Population Estimates," <http://www.pdx.edu/prc/annualorpopulation.html>, June 30, 2009.
- vii US Census, "Population by Race: 2000," Fact Sheet, Wilsonville, OR, www.census.gov.
- viii US Census, "Population by Age: 2000," Fact Sheet, Wilsonville, OR, www.census.gov.
- ix US Census, "Disabled Population: 2000," Fact Sheet, Wilsonville, OR, www.census.gov.
- x US Census, "Ability to Speak English: 2000," Fact Sheet, Wilsonville, OR, www.census.gov.
- xi US Census, "Year Structure Built and Year Householder Moved Into Unit: 2000," Fact Sheet, Wilsonville, OR, www.census.gov.
- xii US Census, "Housing Type: 2000," Fact Sheet, Wilsonville, OR, www.census.gov.
- xiii Morrow, 1999; Burby and others, 2003.
- xiv Burby and others, 2003.
- xv US Census, "Housing Type: 2000," Fact Sheet, Wilsonville, OR, www.census.gov.
- xvi US Census, "Occupation by Sex: 2000," Fact Sheet, Wilsonville, OR, www.census.gov.
- xvii US Census, "Journey to Work: 2000," Fact Sheet, Wilsonville, OR, www.census.gov.
- xviii SMART Transit. <http://ridesmart.com/index.aspx?page=98>, July 10, 2009.
- xix Ibid.
- xx Burby, Raymond J., ed. 1998. *Cooperating with Nature: Confronting Natural Hazards with Land-Use Planning for Sustainable Communities*.
- xxi Federal Emergency Management Agency, Policy & Claim Statistics, June 2009. <http://www.fema.gov/business/nfip/statistics/pcstat.shtm>.
- xxii Clackamas County Community Wildfire Protection Plan, 2005. Page 16-18.
- xxiii Madin, Ian, 1990. *Earthquake-hazard geology maps of the Portland metropolitan area, Oregon; text and map explanation: Portland, OR*. Oregon Department of Geology and Mineral Industries.
- xxiv Yeats, R.S., Graven, E.P., Werner, K.S., Goldfinger, C., and Popowski, T., 1996. *Tectonics of the Willamette Valley, Oregon*. U.S. Geological Survey Professional Paper 1560
- xxv Goldfinger, C., L. D. Kulm, R. S. Yeats, C. Hummon, G. J. Huftile, A. R. Niemi, C. G. Fox, and L. C. McNeill, 1996. *Oblique strike-slip faulting of the Cascadia submarine forearc: the Daisy Bank fault zone off central Oregon*, in Subduction Top to Bottom, G. E. Bebout, D. Scholl, S. Kirby and J. P. Platt (Editors), American Geophysical Monograph 96, 65-74.
- xxvi The Cascadia Region Earthquake Workgroup, 2005. *Cascadia Subduction Zone Earthquakes: A magnitude 9.0 earthquake scenario*. <http://www.crew.org/PDFs/CREWSubductionZoneSmall.pdf>

^{xxvii} Department of Geology and Mineral Studies, 2007. *Statewide Seismic Needs Assessment: Implementation of Oregon 2005 Senate Bill 2 relating to public safety, earthquakes, and seismic rehabilitation of public buildings*. <http://www.oregongeology.org/sub/projects/rvs/OFR-O-07-02-SNAA-onscreen.pdf>.

^{xxviii} NOAA, 1993. *Tsunamis affecting the West Coast of the United States: 1806-1992*.

Appendix A: Planning and Public Process

The following appendix documents Wilsonville’s natural hazards mitigation planning and public involvement processes.

Work Sessions

Intro Hazard Mitigation Plan Meeting Minutes (May 6, 2009)	A2
Intro Hazard Mitigation Plan Meeting Sign-In	A7
Hazard Mitigation Plan Meeting 1 Minutes (May 29, 2009)	A8
Hazard Mitigation Plan Meeting 1 Sign-In	A17
Hazard Mitigation Plan Meeting 2 Minutes (June 19, 2009)	A18
Hazard Mitigation Plan Meeting 2 Sign-In	A21

Public Outreach

Natural Hazards Mitigation Plan News Release (Oct. 29, 2009)	A22
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MINUTES

Meeting: Wilsonville Natural Hazards Mitigation Plan Intro Meeting

Date: May 6, 2009

Time: 2:00 to 3:00pm

Location: Wilsonville City Hall

1. Meeting Attendees

- a. Raymond Brunstrom, Citizen of Wilsonville, retired Fire Chief
- b. Martin Brown, City of Wilsonville Building Official
- c. Blaise Edmonds, City of Wilsonville Planning Department
- d. Tim Woodley, West Linn-Wilsonville School District Director of Operations
- e. John Fraser, Sysco Portland Director of Human Resources and Safety
- f. Steve Munsterman, City of Wilsonville Public Works Supervisor
- g. Daniel Stark, City of Wilsonville GIS Manager
- h. Delora Kerber, City of Wilsonville Emergency Management Coordinator and Public Works Director

2. Natural Hazards Mitigation Plan Overview

- a. The group reviewed the handouts that explain natural hazards mitigation plans, the disaster cycle, and the “understanding risk” Venn diagram
(See handouts below)

3. Planning Process

First Planning Meeting:

During this meeting we will:

- Adopt Plan Mission Statement, Goals, and Objectives
 - We will adopt the Clackamas County Goals and Mission Statement unless the group wants to add to it.
- Determine who will be the Coordinating Body
 - This is the group who will implement the action items in the plan.
- Determine who will be the Convener
 - This is the person who will call the coordinating body together, facilitate meetings, create agendas, etc or designate someone to do these tasks
- Review hazard data and history and get feedback
 - Laurel will research hazard history and email to the group before the next meeting. Between now and the next meeting everyone should be thinking about past natural hazards events.
- Discuss community issues related to each hazard
 - What happened when the hazard hit? Where did the hazard hit? Who was affected? By answering these questions the group will identify vulnerabilities in the community.
- Review next steps – action item updates
 - The action items will be created based on the vulnerabilities identified. The goal of creating a mitigation plan is to reduce the vulnerabilities within a community, and action items are specific projects/programs/etc that a community can do to build resiliency. Laurel will create a list of potential action items, but the group should also be thinking of specific projects to put in the plan.

Second Planning Meeting:

During this meeting we will discuss the following:

- Create mitigation action items
 - The reason we make natural hazards mitigation plans is to create action items that address each of the vulnerabilities. Laurel will create a list of suggested action items and the group will review and add action items as needed.
- Discuss the formal review process and plan maintenance
 - We will come up with a schedule of meetings and tasks so the action items can be implemented.
- Discuss public involvement
 - The public needs to be made aware of the plan's existence both during and after the planning process. Once we have a final draft of the plan we will need to advertise it to the public and allow time for comments.
- Review timeline for city review, OPDR review, FEMA review
 - Once Laurel finishes her draft she will email it to the committee for editing. The Oregon Partnership for Disaster Resilience will also review the plan and then send it off to FEMA for preliminary review.
- Review process for adoption
 - The City Council will need to adopt the plan after FEMA gives preliminary approval.

4. Needs from you

- Maps – GIS department participation
 - Laurel will email the “map needs” document to Daniel
- Access to existing plans/policies
 - Laurel can find plans linked on the city website. Let Laurel know of any additional plans the city does not post online, as portions of those plans could be pertinent to the natural hazards mitigation plan.
- List of critical facilities, infrastructures, populations
 - These are your community assets, and the destruction or damage of one or more of these facilities would have an impact on the community.
- Hazard history facts/statistics
 - The group should be thinking of the impacts of past natural disasters on the city to prepare for the next meeting. Any numbers you have (# of damaged homes, costs to repair, etc) would be very beneficial.
- Most recent employment and economics data
 - Laurel will use the 2000 Census data unless the city has more up-to-date information
- Land use and development information
 - Future development should be discussed in the NHMP
- Existing mitigation projects, education, etc

5. Next meeting: Friday, May 29th from 10:00am to 2:00pm

HANDOUT



What is ‘natural hazards mitigation’?

Natural hazards mitigation is defined as permanently reducing or alleviating the losses of life, property and injuries resulting from natural hazards through long and short-term strategies.

Engaging in mitigation activities provides jurisdictions with a number of benefits, including reduced loss of life, property, essential services, critical facilities and economic hardship; reduced short-term and long-term recovery and reconstruction costs; increased cooperation and communication within the community through the planning process; and increased potential for state and federal funding for recovery and reconstruction projects.

Why develop a natural hazards mitigation plan?

A natural hazards mitigation plan provides a community with a set of goals, action items, and resources designed to reduce risk from future natural disaster events. The process of developing a mitigation plan can also forge new partnerships among community organizations, businesses, and local citizens. These partnerships can lead to the development and implementation of risk reduction strategies that assist the community in reducing losses from any future natural disaster events.

In 2000, Congress approved the Disaster Mitigation Act of 2000 (DMA2K). DMA2K set forth requirements for communities to develop and adopt local natural hazard mitigation plans to become eligible for mitigation grant funding, including FEMA’s Hazard Mitigation Grant Program (HMGP), and Pre-Disaster Mitigation (PDM) Grant Program.

What does a mitigation plan do?

Natural hazards mitigation plans document knowledge about the problems associated with natural hazards in a community. A mitigation plan articulates goals that will guide the community in implementing short- and long-term risk reduction activities, recommending appropriate mitigation action items, and identifying resources to implement activities. Preparing a mitigation plan for your community can reduce public and private costs resulting from natural disaster events. Successes in risk reduction and loss prevention are achieved by implementing programs that address and mitigate the potential impacts natural disasters may have on society, the economy, and the environment.

How will the county help with this process?

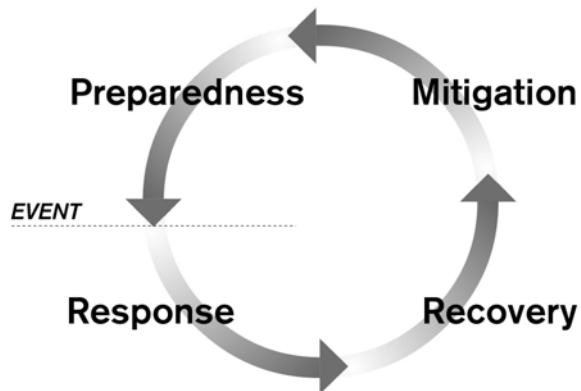
In an effort to assist each city in their addendum development process, Clackamas County partnered with the Oregon Partnership for Disaster Resilience (OPDR) at the University of Oregon to hire a Resource Assistance for Rural Environments Participant (RARE Participant). The RARE Participant was hired using funds made available through the Hazard Mitigation Grant Program, and she will work with each participating city in developing an addendum to Clackamas County’s Natural Hazards Mitigation Plan. The planning processes will occur between February and August 2009.

The RARE Participant will be responsible for developing and facilitating all natural hazards mitigation plan meetings within each city. Likewise, the RARE Participant will be responsible for documenting the results of each meeting, and preparing a draft addendum for all cities involved.

The Disaster Cycle

The emergency management profession and FEMA have used the concept of the disaster cycle (Figure 1-1) to describe the phases of a disaster. Although described as separate phases, each phase is tied to the others. It is helpful to think of the disaster cycle as a simple equation. Every risk or vulnerability we mitigate today reduces our overall exposure whereby decreasing the pressure on the response side of the disaster cycle and lowering our recovery costs from future events. This section defines the four phases and describes plans and activities associated with them. The four phases, Response, Recovery, Preparedness, and Mitigation can be described as follows:

Figure 1-1: The Disaster Cycle



Response

Response begins as soon as a disaster event occurs. Response is the provision of search and rescue, medical services, and access control as well as repairing and restoring communication and data systems during a crisis. A coordinated response plan can help reduce casualties, damage, and decrease recovery time. Examples include emergency operations plans and business continuity plans and established networks of first responders.

Recovery

Recovery operations provide for basic needs and restore the community. There are two components in the recovery phase. During the first phase, infrastructure is examined, and repairs are conducted to restore water, power, communication and other utilities. The second phase includes returning to normal functions and addressing future disasters. The process of recovery can take months or possibility years to accomplish depending upon the event. An example would be the development of a post-disaster recovery plan.

Preparedness

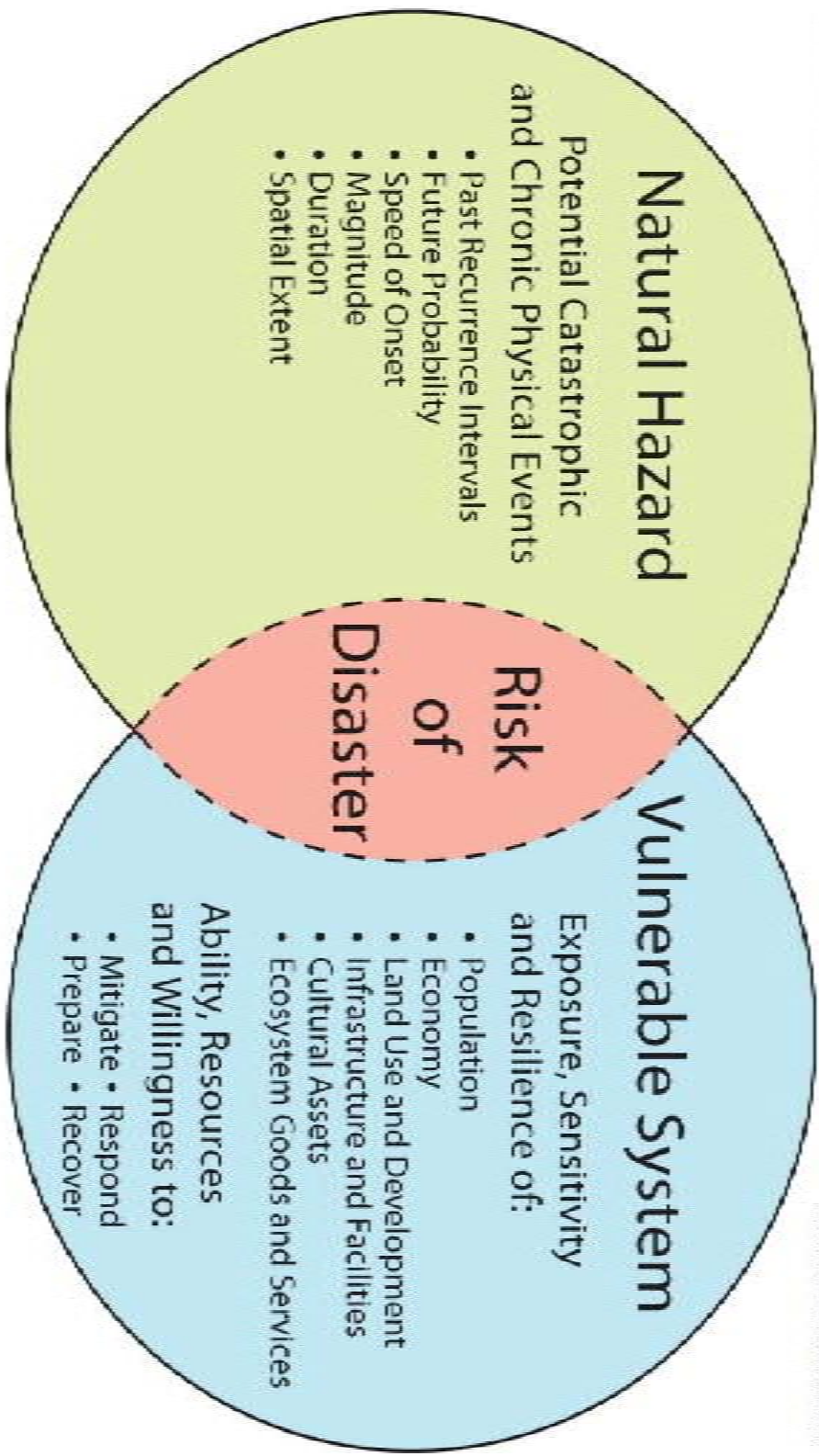
Preparedness refers to activities, programs, and systems developed in advance of a disaster designed to build and enhance capabilities at an individual, business, community, state and federal level to support the response to and recovery from disasters. Example strategies might include developing awareness and outreach campaigns and training targeted to individuals and businesses on personal and professional responsibility to be self sufficient for at least 72 hours post-disaster.

Mitigation or Risk Reduction

Mitigation is the act of reducing or eliminating future loss of life and/or property, and/or injuries resulting from hazards through short and long-term activities. Mitigation strategies may range in scope and size; however, no matter the size, effective mitigation activities have the potential to reduce the vulnerability and/or exposure to risk and impact of disasters. Example mitigation activities for flooding include acquiring, elevating, or relocating structures; for seismic include building code, retrofitting buildings or infrastructure and non-structurally retrofitting labs and offices; and for wind or winter storms include under grounding power lines and tree replacement programs.



Understanding Risk



Source: USGS-ONHW Research Collaboration, 2006

Natural Hazard Mitigation Plan Introductory Meeting

City of Wilsonville
 May 6, 2009
 2:00 to 3:00pm

First	Last	Agency	Job Title	Email	Roundtrip Mileage
RAYMOND	BRUNSTROM	RETIRED	FIRE CHIEF	RBRUNSTROM@COMCAST.NET	4 MILES
MARTIN	Brown	city of wilsonville	BIDG. OFFICINL	brown@ci.wilsonville.or.us	1
BLAISE	EDMONDS	CITY WIL.	PLANNING	edmonds@ci.wilsonville.or.us	1
Tim	Woodley	West Linn-Wilsonville School DISTRICT	Director of operations	woodleyt@wlwv.k12.or.us	2
JOHN	FRASER	SYSCO PORTLAND INC	DIRECTOR OF HR + SAFETY	FRASER.JOHN@POX.SYSCO.COM	
Steve	Munsterman	City of Wilsonville Wilsonville	Public Works Supv		4 ↓
Daniel	Stark	wilsonville	GIS Manager	stark@ci.wilsonville.or.us	—
DELORA	KERBER	CITY OF WILSONVILLE	EMERGENCY MANGMT COORD PUBLIC WORKS DIRECTOR	kerber@ci.wilsonville.or.us	—



Meeting: Wilsonville Natural Hazard Mitigation Plan Meeting 1
Date: May 29, 2009
Time: 10:00 to 2:00pm
Location: City Hall

MINUTES

1. Meeting Attendees
 - a. Martin Brown, City of Wilsonville Building Official
 - b. Raymond Brunstrom, Citizen of Wilsonville, retired Fire Chief
 - c. Blaise Edmonds, City of Wilsonville Planning Department
 - d. Randy Edmiston, Sysco Portland Facilities Director
 - e. John Fraser, Sysco Portland Director of Human Resources and Safety
 - f. Delora Kerber, City of Wilsonville Emergency Management Coordinator and Public Works Director
 - g. Steve Munsterman, City of Wilsonville Public Works Supervisor
 - h. Daniel Stark, City of Wilsonville GIS Manager
 - i. Tim Woodley, West Linn-Wilsonville School District Director of Operations

2. Planning Process
 - a. Mission and Goals
 - i. The group agreed to adopt the county's mission and goals
 - b. Plan Adoption
 - i. The City Council will be responsible to adopt the plan
 - c. Coordinating Body
 - i. The group assembled is called the Hazard Mitigation Advisory Committee
 - d. Convener
 - i. The Emergency Management Coordinator will be the convener
 - e. Public Involvement
 - i. The plan will be available online and a hard copy will be in City Hall
 - ii. Articles will be published in the Wilsonville Spokesman (local newspaper) and Boones Ferry Messenger (local newsletter)
 - iii. The West Linn-Wilsonville School District website will link to the plan
 - iv. The Chamber of Commerce website will link to the plan
 - v. An article could be put in the Chamber of Commerce newsletter (Delora will ask about this)
 - vi. The committee will schedule public meetings when deemed necessary, such as after a hazard event

3. Community Assets
 - a. **Critical Facilities:** Those facilities and infrastructure necessary for emergency response efforts

- i. City Hall/EOC
- ii. Fire Station 52 (Kinsman Road – west side)
- iii. Fire Station 56 (Elligsen Road – northeast)
- iv. Public Works Building/Police Station/EOC #2
- v. Fleet Services Building
- vi. Potential Shelter Sites
 - 1. Wilsonville High School (east side)
 - 2. Wood Middle School (west side)
 - 3. Springridge Court at Charbonneau (southeast)
- b. **Essential Facilities:** Those facilities and infrastructure that supplement response efforts
 - i. Schools
 - 1. Boeckman Creek Primary School
 - 2. Boones Ferry Primary School
 - 3. Inza R. Wood Middle School
 - 4. Wilsonville High School
 - 5. Arts and Technology High School (Art Tech High)
 - 6. Mentor Graphics Child Development Center (Kindergarten)
 - 7. Northwest Montessori School (Pre-school and Kindergarten)
 - 8. Pacific Northwest Academy (Elementary)
 - 9. WLWV at Town Center (Pre-school to 7th grade)
 - 10. Learning Tree Pre-school (pre-school to 4th grade)
 - 11. Pioneer Pacific College
 - 12. Clackamas Community College
 - 13. New primary school at Villebois (under construction)
 - ii. Library
 - iii. Community Center
 - iv. Providence Medical Facility
 - v. Coffee Creek Correctional Facility
 - vi. Allied Waste Services
 - vii. SMART Transit Facility (WES Commuter Rail Site)
 - viii. Food providers
 - 1. Sysco
 - 2. Costco
 - 3. Lams
 - 4. Albertsons
 - ix. Pharmacies
 - 1. Rite Aid distribution center
 - 2. McKesson HBOC distribution center
 - 3. Albertsons
 - 4. Costco
 - 5. Rite Aid
 - 6. Target

7. Walgreens
- c. **Critical Infrastructure:** Infrastructure that provides services for the city
 - i. Arterials (*designates road maintained by others)
 1. I-5*
 2. 95th Ave
 3. Barber Street
 4. Boeckman Road
 5. Boones Ferry Road
 6. Canyon Creek Road
 7. Day Road*
 8. Elligsen Road
 9. French Prairie Drive
 10. Grahams Ferry Road*
 11. Kinsman Road
 12. Miley Road*
 13. Parkway Center Drive
 14. Ridder Road
 15. Stafford Road*
 16. SW Touchman
 17. Town Center Loop
 18. Wilsonville Road
 - ii. Bridges
 1. Boones Bridge
 2. Rail bridge at Boones Landing
 - iii. Waste Water Treatment Plant
 - iv. Water Treatment Plant
 - v. Commuter Rail Station (WES); freight tracks
 - vi. Electric substations
 - vii. Pump stations
 - viii. Gas lines
 - ix. Power lines
 - x. Reservoirs
 - xi. Communications towers (Elligsen, Pioneer Court, Villebois)
 - xii. High pressure gas line
 - xiii. High pressure fuel line
- d. **Vulnerable Populations:** Locations serving populations that have special needs or require special consideration
 - i. Schools
 - ii. Day care facilities (Laurel will look these up)
 - iii. Canyon Creek Correctional Facility
 - iv. Senior Care Facilities
 1. Avalon Adult Center
 2. Creekside Woods
 3. Marquis Care at Wilsonville
 4. Springridge Court at Charbonneau

- 5. The Wilsonville
- 6. Windfield Village
- v. Charleston at Villebois
- vi. Rainwater Gardens at Villebois
- vii. Renaissance at Villebois
- e. **Cultural or Historic Assets:** These assets include those facilities that augment or help devine community character, and if lost would represent a significant loss for the community
 - i. Clackamas County Visitors Center
 - ii. CREST Environmental Learning Center
 - iii. Korean War Museum
 - iv. METRO Graham Oaks Nature Park and Trailhead
 - v. Murase Plaza
 - vi. Old Town (Historic)
 - 1. Aden’s Store
 - 2. Cottage Hotel
 - 3. Norris Machine
 - 4. Old Bank
 - 5. Old Feed Store
 - 6. Old Methodist Church
 - 7. Old Town Village
 - 8. Old Train Station
 - 9. St. Cyril’s
 - 10. Stein-Boozier Barn
 - 11. Tauchman House
- f. **Economic Assets/Populations Centers:** *Economic Centers* are those businesses that employ large numbers of people, and provide an economic resource to the City of Canby. If damaged, the loss of these economic centers could significantly affect economic stability and prosperity. *Population Centers* usually are aligned with economic centers, and will be of particular concern for evacuation/notification during a hazard event.
 - i. Wilsonville Chamber of Commerce
 - ii. Allied Waste Management
 - iii. Argyle Square
 - iv. APCON, Inc
 - v. Charbonneau Village Town Center
 - vi. Coca-Cola Bottling of Oregon
 - vii. Coherent
 - viii. Crimson Trace Corporation
 - ix. FOODesign Machinery and Systems, Inc
 - x. FLIR Systems
 - xi. InFocus
 - xii. Kinetics
 - xiii. Mentor Graphics
 - xiv. OrePac
 - xv. Pacific Pride

- xvi. Prologic
- xvii. Rite Aid Distribution Center
- xviii. Rockwell Collins
- xix. Sysco Food Services of Portland, Inc
- xx. Tarr fueling
- xxi. Xerox Corporation
- xxii. Wilsonville Concrete
- g. **Environmental Assets:** Environmental assets are those parks, green spaces, wetlands, and rivers that provide an aesthetic and functional service for the community.
 - i. Willamette River
 - ii. Arrowhead Creek
 - iii. Basalt Creek
 - iv. Boeckman Creek
 - v. Canyon Creek
 - vi. Coffee Creek
 - vii. Meridian Creek
 - viii. Coffee Lake Wetlands
 - ix. Canyon Creek Park
 - x. Boones Ferry Park
 - xi. Courtside Park
 - xii. Hathaway Park
 - xiii. Memorial Park
 - xiv. Merryfield Park
 - xv. River Fox Park
 - xvi. Town Center Park
 - xvii. Tranquil Park
 - xviii. Villebois park system
 - xix. Willamette River Water Treatment Plant Park
 - xx. Willow Creek Landover Park
 - xxi. South Tributary
 - xxii. Community Garden
 - xxiii. Graham Oaks Natural Area
 - xxiv. Boeckman Creek Crossing Trail
 - xxv. Charbonneau Golf Course
- 4. Mitigation Planning Priority System Discussion
 - a. The group will use the priority system recommended by the Oregon Partnership for Disaster Resilience
- 5. Hazard Identification
 - a. Laurel created a handout detailing each of the following hazards: flood, landslide, wildfire, earthquake, severe storm, and volcano. The group went over each hazard and added information on impacts, history, mitigation efforts, and compared Wilsonville’s probability/vulnerability to the county’s ratings. The following is information added to the handout.

- b. All Hazards
 - i. I-5 splits Wilsonville in half. If a large emergency were to occur I-5 could experience immense gridlock or even close. Citizens would have a very difficult time getting around town if access problems were to occur on I-5.
- c. Flood
 - i. 1964
 - 1. The Marina flooded
 - ii. February 1996
 - 1. Flooding was not as severe in Wilsonville as it was in other cities.
 - 2. The high water level meant the creeks could not drain into the Willamette River, causing them to back up.
 - 3. Flooding occurred in Memorial Park. The sewer lift station in Memorial Park was not affected because it was sandbagged and pumped for many days.
 - 4. Three homes on Rose Lane experienced flooding. Two homes had living space flood and one had storage space flood.
 - iii. January 2009
 - 1. Rose Lane had a few inches of water on it
 - 2. La Quinta Hotel on Sun Place had some flooding (same as 1996)
 - 3. Otherwise not much of a problem
 - iv. Impacts
 - 1. The city has a few choke points that can back up during a heavy precipitation event. 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.
 - v. Probability: High
 - vi. Vulnerability: Low (less than the county's moderate ranking) – less than 1% of the population was affected in the 1996 flood, which was the worst flood to date.
 - vii. Mitigation
 - 1. The sewer lift station in Memorial Park is scheduled for relocation in about a year.
 - 2. The Villebois development is creating a diversion to fix the flooding problem at Inza R. Wood Middle School
 - 3. Homes are required to be built 2 feet above base flood level
 - 4. The city regularly inspects and maintains the stormwater facilities

5. Development review practices and conditions of development require 100% accounting of stormwater management on site
6. The FOG program education was removed because that deals with sewage pipes, not stormwater pipes

d. Landslide

- i. Wilsonville does not have a history of landslides. This is due to a primary and secondary open space ordinance in effect in the late 70s. 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 (now the Significant Resource Overlay Zone) means that very little development has occurred on steep slopes.
- ii. Impacts
 1. Steep slopes exist along the banks of the Willamette River. A few neighborhoods were built near these slope areas including:
 - a. Day Dream Ranch
 - b. Cedar Point
 - c. Edgewater
 - d. Charbonneau
 2. Canyon Creek Apartments are built on a moderate hill near the creek
- iii. Probability: Low (less than the county's high probability) because the city has no history of landslides and very few areas at risk to landslides
- iv. Vulnerability: Low
- v. Mitigation
 1. Rivergreen Stormwater Outfall Improvement was just completed. This project stabilized the banks.
 2. The city has a maintenance plan to ensure the storm water drains are regularly cleaned in Cedar Ridge and Daydream Ranch. This action began after a home slide in the Portland West Hills as a result of improper drainage.
 3. A tree detention program requires trees over 6" in diameter at breast height cannot be cut down.

e. Wildfire

- i. Most instances of fire have started by the rails and I-5, but these fires have been small enough to contain quickly
- ii. A small fire started at Cedar Way and spread to the end of Montgomery Way. A homeowner on Cedar Way was doing back burning and went on vacation. East winds blew the fire out of containment. The area was difficult to access but no damages major damages occurred.
- iii. Impacts
 1. Areas with dense tree coverage include:

- a. The Beckman Creek Corridor
 - b. Area east of Wilsonville High School (access would be a problem here)
 - c. Area north of Elligsen near fire station 56
 - d. Xerox woods
 - e. METRO Graham Oaks Nature Park
 - f. LEC (Learning Enrichment Center)
 - g. Burnerts Orchard
- iv. Probability: Moderate
 - v. Vulnerability: Moderate
 - vi. Mitigation
 - 1. The city enforces open lots to have grasses cut before July 4th. If the property owner does not cut the grass the city will do it.
 - 2. The Significant Resources Overlay Zone has prohibited development in many of the dense forested areas
 - 3. Tualatin Valley Fire & Rescue has an active public education program for high risk-wildfire areas.
 - 4. TVF&R adopted a district-wide wildland map that governs new construction
- f. Severe Storm: Wind and Winter
 - i. The causes and characteristics, historical occurrences, and impacts detailed in the county plan apply to Wilsonville.
 - ii. Wilsonville has fairly new buildings and most are structurally sound and can withstand heavy snow pack.
 - iii. Impacts
 - 1. The city does not have many steep hills. The Canyon Creek Apartment Complex has steep driveways, but these are the only areas that may be difficult to use during freezing weather.
 - 2. If I-5 is not plowed it causes lots of congestion in the city.
 - iv. Probability
 - 1. Winter: High
 - 2. Wind: High, this is higher than the county's moderate. History has shown wind events occur frequently.
 - v. Vulnerability
 - 1. Winter: Moderate
 - 2. Wind: Low
 - vi. Mitigation Steps Taken
 - 1. Most existing utilities have been undergrounded. All new utilities are required to be undergrounded.
 - 2. The city's critical facilities have back up power generators
 - 3. The city has designated snow plow and sanding routes.
- g. Earthquake
 - i. The causes and characteristics, historical occurrences, and impacts detailed in the county plan apply to Wilsonville.

- ii. The 1993 Scotts Mills quake caused minor damage to tilt up buildings where the beam meets the exterior wall.
 - iii. Wilsonville was incorporated in 1969 so most of its buildings are up to current code and seismically sound.
 - iv. Impacts
 - 1. Wastewater Treatment Plant, Community Center, and Public Works/Police Station are not seismic.
 - 2. The 2006 Rapid Visual Screening Seismic Needs Assessment from DOGAMI found Inza R. Wood Middle School to have a ‘high’ (>10%) collapse potential (http://www.oregongeology.com/sub/projects/rvs/reports/Clac_sch92.pdf). One of the Clackamas Community College buildings received a ‘very high’ (100%) collapse potential (http://www.oregongeology.com/sub/projects/rvs/reports/Clac_coc08.pdf).
 - v. Probability: High
 - vi. Vulnerability: High
 - vii. Mitigation
 - 1. City Hall and Water Treatment Plant are up to the newest building codes. These buildings are built so they can be occupied after large events.
 - 2. Tualatin Valley Fire & Rescue is planning to rebuild Station 56 (Elligsen Road) at the end of the year and will include structural seismic mitigation into the rebuild.
 - 3. TVF&R will seismically upgrade Station 52 (Kinsman)
 - 4. ODOT seismically upgraded Boone Bridge
 - h. Volcano
 - i. The causes and characteristics, historical occurrences, and impacts detailed in the county plan apply to Wilsonville.
 - ii. A volcanic eruption would primarily be a maintenance problem and would cause damage to vehicles.
 - iii. Probability: Low
 - iv. Vulnerability: High
6. Next Time: Action Items
- a. At the next meeting we will discuss action items and the formal review process.
 - b. Think of action items as a wish list. If someone gave you a big pot of money to perform mitigation projects what would you do with it?
 - c. The next meeting was scheduled for Friday, June 19th at City Hall from 10:00am to 2:00pm.

Natural Hazard Mitigation Plan Update Meeting 1

City of Wilsonville
 May 29, 2009
 10:00 am to 2:00 pm

First	Last	Agency	Job Title	Email	Roundtrip Mileage
RAY	BRUNSTROM	CITIZEN	RETIRED FIRE CHIEF	RBRUNSTROM@COMCAST.NET	
Randy	Edmiston	Sysco Foods	Facilities Director	edmiston.Randy@PDX.SYSCO.COM	
John	FRASER	" "	HR + SAFETY DIRECTOR	FRASER JOHN@FOX.SYSCO.COM	
Tim	Woodley	WLWV-SD	Dir of Operations	woodleyt@wlwv.k12.or.us	—
BLAISE	EDMONDS	CITY	SENIOR PLANTER	edmonds@ci.wilsonville.or.us	—
Steve	Mansterman	City PW	Operations Supervisor		—
Dan	Stark	City GIS	GIS Manager	stark@ci.wilsonville.or.us	—
DELOREN	KERBER	WILSONVILLE	EMERGENCY MNMT COOD & PUBLIC WORKS DEPT	kerber@ci.wilsonville.or.us	—
Martin Brown	Brown	Wilsonville	Building official	brown@ci.wilsonville.or.us	

Meeting: Wilsonville Natural Hazards Mitigation Plan Meeting 2
Date: June 19, 2009
Time: 10:00am to 2:00pm
Location: Wilsonville City Hall

MINUTES

1. Meeting Attendees
 - a. Martin Brown, City of Wilsonville Building Official
 - b. Raymond Brunstrom, Citizen of Wilsonville, retired Fire Chief
 - c. Blaise Edmonds, City of Wilsonville Planning Department
 - d. John Fraser, Sysco Portland, Inc. Director of Human Resources and Safety
 - e. Delora Kerber, City of Wilsonville Emergency Management Coordinator and Public Works Director
 - f. Steve Munsterman, City of Wilsonville Public Works Supervisor
 - g. Jeff Rubin, Tualatin Valley Fire & Rescue Emergency Manager
 - h. Daniel Stark, City of Wilsonville GIS Manager
 - i. Tim Woodley, West Linn-Wilsonville School District Director of Operations

2. Formal Review Process and Plan Maintenance
 - a. The convener of designee will assign representatives to the committee
 - b. The committee will meet twice a year. The first meeting will be held in April to discuss the previous hazard season (severe storm, flood, etc) and prepare for upcoming hazard seasons (wildfire, earthquake awareness month, etc). The second meeting will be held in October.
 - c. During the first meeting, the committee will:
 - Discuss funding opportunities for the implementation of mitigation strategies.
 - Review existing action items to determine appropriateness for funding;
 - Educate and train new members on the plan and mitigation in general; and
 - Identify issues that may not have been identified when the plan was developed.During the second meeting of the year, the committee will:
 - Review existing and new risk assessment data, and incorporate this information into the plan;
 - Document success in implementing mitigation actions and/or applying for funding;
 - Discuss the addition and/or subtraction of mitigation actions from the plan;
 - Discuss methods for continued public involvement;
 - Document successes and lessons learned during the year; and
 - Generate a list of members that should be included in future meetings.
 - d. Timeline for plan updates

- i. The plan will be updated every five years follow the follow county's update cycle. This means the first update will be due in September 2012.
 - ii. The update process will begin in September 2011. The committee will take 4 to 5 months to update the plan, and the remaining months will allow sufficient time for FEMA review and edits.
- e. The convener will be responsible for developing and facilitating plan update meetings. The committee will assist the convener throughout the update process.
- f. During the plan evaluation the committee will ask:
- Have public involvement activities taken place since the plan was adopted?
 - Are there new hazards that should be addressed?
 - Have there been hazard events in the community since the plan was adopted?
 - Have new studies or previous events identified changes in any hazard's location or extend?
 - Has vulnerability to any hazard changed?
 - Have development patterns changed? Is there more development in hazard prone areas?
 - Do future annexations include hazard prone areas?
 - Are there new high risk populations?
 - Are there completed mitigation actions that have decreased overall vulnerability?
 - Did the plan document and/or address National Flood Insurance Program repetitive loss properties?
 - Did the plan identify the number and type of existing and future buildings, infrastructure, and critical facilities in hazards areas?
 - Did the plan identify data limitations?
 - Did the plan identify potential dollar losses for vulnerable structures?
 - Are the plan goals still relevant?
 - What is the status of each mitigation action?
 - Are there new actions that should be added?
 - Is there an action dealing with continued compliance with the National Flood Insurance Program?
 - Are changes to the action item prioritization, implementation, and/or administration processes needed?
 - Do changes need to be made within the five year update schedule?
 - Is mitigation being implemented through existing planning mechanisms (such as comprehensive plans, or capital improvement plans)?

3. Earthquake Probability Ranking Discussion
 - a. Jeff Rubin of Tualatin Valley Fire & Rescue could not attend previous meeting but reviewed the minutes. He wanted to bring up the earthquake probability ranking with the group because all the research he has done reveals a low probability of a large earthquake event.
 - b. Jeff's main argument for reducing the probability of earthquakes from 'high' to 'low' is that the chance of a damaging earthquake in the next 50 years is 10-15%. Jeff believes the probability ranking should only take into account damaging earthquakes.
 - c. The group agreed with Jeff and changed the probability ranking of an earthquake to 'low'.

4. Review Anatomy of an Action Item
 - a. Laurel reviewed the elements to be included in an action item before the group began discussions.

5. Update and Brainstorm Action Items
 - a. Laurel provided the group with a list of potential action items based on the vulnerabilities they identified in the previous meeting. The group reviewed and updated the action items and added new ones as they saw fit.
 - b. See the attached action item sheet for final list

6. Next Steps
 - a. Laurel will compile the plan and email it out to the committee for review. The Oregon Partnership for Disaster Resilience will also edit the plan.
 - b. Once a final draft is completed it will need to be presented to the public for their comments. This can mean posting the plan online, writing a press release, presenting it at a community meeting/event, etc.
 - c. Once public comment is completed the plan will be sent into FEMA for preliminary review. Preliminary review takes between 40 and 60 days.
 - d. FEMA will either pre-approve the plan or return the plan with edits. Laurel will make any necessary edits and then resubmit the plan. If Laurel is gone before this stage the Oregon Partnership for Disaster Resilience will help with the edits.
 - e. After we've gained pre-approval the plan will need to be adopted by City Council and then resent to FEMA for official approval.

Natural Hazard Mitigation Plan Introductory Meeting

City of Wilsonville
 June 19, 2009
 10:00am to 2:00pm

First	Last	Agency	Job Title	Email	Roundtrip Mileage
RAY	BRUNSTROM	RETIRED	FIRE CHIEF	RBUNSTROM@COMCAST.NET	
Jeff	Rubin	TUFR	Emergency Mgr	jeff.rubin@tufr.com	
Daniel	Stark	COW	GIS Mgr	Stark@	
Steve	Munsterman	COW PW	PW Supervisor		—
BLAISE	EDMONDS	COW	PLANNER	EDMONDS@ci.wilsonville.or.us	—
JOHN	FRASER	545CO	HR/SAFETY DIRECTOR	FRASER.JOHN@PDX.545CO	50M
BEWORN	KERBER	City of Wilsonville	PW DIRECTOR/EM	kerber@ci.wilsonville.or.us	—
Tim	Woodley	WLWV-SD	Director of Operations	woodleyt@wlwv.k12.or.us	—
MARTIN	BROWN	City of Wilsonville	Building Official	brown@ci.wilsonville.or.us	—



NEWS RELEASE

**For Immediate Release
2009**

November 18,

Dan Knoll - Public Affairs Coordinator 503-570-1502

City of Wilsonville seeks public input on Natural Hazards Mitigation Plan at Nov. 16 City Council meeting

WILSONVILLE, Ore --- The City of Wilsonville is seeking public input on the city's natural hazards mitigation plan during the Nov. 16 City Council meeting. The plan will be used to help reduce future losses and damages during a natural hazard such as a flood, landslide, wildfire, severe storm, earthquake, and volcano.

“It is impossible to predict exactly when disasters may occur, or the extent to which they will affect the city,” said Public Works Director Delora Kerber. “However, with careful planning and collaboration among public agencies, private sector organizations, and citizens within the community, it is possible to minimize the losses that can result from natural hazards.”

The plan provides Wilsonville with a set of goals, action items, and resources designed to reduce risk from future natural disaster events. The process of developing a mitigation plan can also forge new partnerships among community organizations, businesses, and local citizens. These partnerships can lead to the development and implementation of risk reduction strategies that assist the community in reducing losses from any future natural disaster events.

Engaging in mitigation activities provides jurisdictions with a number of benefits, including reduced loss of life, property, essential services, critical facilities and economic hardship; reduced short-term and long-term recovery and reconstruction costs; increased cooperation and communication within the community through the planning process; and increased potential for state and federal funding for recovery and reconstruction projects.

“We hope residents will take a look at the plan and let us know if there is something else we should consider,” said Kerber. “This is a community based plan and the more input we receive from community members will help ensure that we have a more comprehensive plan.”

Appendix B: Action Item Worksheets

Multi Hazard #1

Proposed Action Item:		Alignment with Plan Goals:
Develop public education programs to inform the public about methods of mitigating the impacts of natural hazards.		<i>Protect Life and Property, Promote Public Awareness, Encourage Partnerships and Implementation</i>
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. 		
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:	Tualatin Valley Fire & Rescue	
Internal Partners:		External Partners:
Hazard Mitigation Advisory Committee		Neighborhood Associations, Wilsonville Chamber of Commerce, Clackamas County, Oregon Partnership for Disaster Resilience
Timeline:		If available, estimated cost:
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)	
Ongoing		
Form Submitted by:	Hazard Mitigation Advisory Committee	
Status	New Action, 2009	

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.		<i>Protect Life and Property, Promote Public Awareness, Enhance Natural Systems, Encourage Partnerships and Implementation, Augment Emergency Services</i>
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. 		
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 Department	
Internal Partners:		External Partners:
Public Works Department, Building Department, Planning Commission, Natural Resources		Oregon Partnership for Disaster Resilience, Department of Land Conservation and Development, Oregon Department of Transportation, Department of Environmental Quality
Timeline:		If available, estimated cost:
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)	
Ongoing		
Form Submitted by:	Hazard Mitigation Advisory Committee	
Status	New Action, 2009	

Multi Hazard #3

Proposed Action Item:		Alignment with Plan Goals:
Identify and pursue funding opportunities to develop and implement hazard mitigation activities.		<i>Protect Life and Property, Promote Public Awareness, Enhance Natural Systems, Encourage Partnerships and Implementation, Augment Emergency Services</i>
Rationale for Proposed Action Item:		
<ul style="list-style-type: none"> • Implementation cannot occur without proper funding. The switch from planning to implementation is the step that begins the reduction of risk. • The Pre-Disaster Mitigation Grant Program provides funds for hazard mitigation planning and project implementation prior to a disaster event. PDM grants are nationally competitive. • The Hazard Mitigation Grant Program provides funds to implement long-term hazard mitigation measures and projects after a major disaster declaration. HMGP funds are available to communities within states that have recently received Presidential Disaster Declarations. HMGP funds are prioritized for communities that are directly affected by a disaster, but communities outside of the disaster declaration are typically eligible as well. • Flood Mitigation Assistance helps communities implement measures that reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the National Flood Insurance Program. 		
Ideas for Implementation:		
<ul style="list-style-type: none"> • Meetings will be held semi-annually to discuss, update, and implement actions in the NHMP. Funding opportunities should also be discussed at the semi-annual meetings; • Develop incentives for special service districts, citizens, and businesses to pursue hazard mitigation projects; • Allocate city resources and assistance to mitigation projects when possible; and • Partner with other organizations and agencies to identify grant programs and foundations that may support mitigation activities. 		
Coordinating Organization:	TVF&R, Planning Department, Building Department, Community Development Department, Public Works Department, Natural Resources, Human Resources, Hazard Mitigation Advisory Committee	
Internal Partners:		External Partners:
Finance Department, City Council		Clackamas County Emergency Management, Tualatin Valley Fire & Rescue, Oregon Emergency Management, FEMA Region X
Timeline:		If available, estimated cost:
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)	
	Ongoing	
Form Submitted by:	Hazard Mitigation Advisory Committee	
Status	New action in 2009	

Multi Hazard #4

Proposed Action Item:		Alignment with Plan Goals:	
Continue to update and improve hazard assessments in the Natural Hazards Mitigation Plan as new information becomes available.		<i>Promote Public Awareness, Augment Emergency Services</i>	
Rationale for Proposed Action Item:			
<ul style="list-style-type: none"> • The city was unable to conduct a quantitative risk analysis for most hazards. • Oregon updates the state risk assessment once every three years. Communities are informed of new risk information if it affects areas in their jurisdiction. • New demographic data will become available after the 2010 census. 			
Ideas for Implementation:			
<ul style="list-style-type: none"> • Continue to update vulnerability assessment as data becomes available and new development occurs; • Cooperate with participating agencies or secure funding needed to obtain data to perform a risk analysis; • Update GIS hazards maps as information becomes available; • Use new data to guide public outreach programs and update educational outreach pieces; and • Update codes and city policies when new data and information becomes available as required by state planning goal 7. 			
Coordinating Organization:		Hazard Mitigation Advisory Committee	
Internal Partners:		External Partners:	
Planning, Community Development, and GIS Departments		Tualatin Valley Fire & Rescue, Clackamas County Emergency Management, Washington County Emergency Management, METRO, Oregon Emergency Management, DOGAMI, FEMA	
Timeline:		If available, estimated cost:	
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)		
Ongoing			
Form Submitted by:	Hazard Mitigation Advisory Committee		
Status	New Action, 2009		

Multi Hazard #5

Proposed Action Item:		Alignment with Plan Goals:
Continue vegetation management throughout the city.		<i>Protect Life and Property, Promote Public Awareness, Enhance Natural Systems, Encourage Partnerships and Implementation</i>
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. 		
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:	Community Development Department	
Internal Partners:		External Partners:
Planning and Public Works Departments		Clackamas County, railroad companies, ODOT, ODF, PGE, USFS
Timeline:		If available, estimated cost:
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)	
<u>Ongoing</u>		
Form Submitted by:	Hazard Mitigation Advisory Committee	
Status	New Action, 2009.	

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.		<i>Protect Life and Property, Promote Public Awareness, Enhance Natural Systems, Encourage Partnerships and Implementation, Augment Emergency Services</i>	
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, provided that 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. 			
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 DLCDC and FEMA during Community Assistance Visits. Conduct an assessment of 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 Department	
Internal Partners:		External Partners:	
GIS and Planning Departments		FEMA, DLCDC, Clackamas County Planning Department	
Timeline:		If available, estimated cost:	
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)		
Ongoing			
Form Submitted by:	Hazard Mitigation Advisory Committee		
Status	New Action, 2009		

Flood #2

Proposed Action Item:		Alignment with Plan Goals:	
Coordinate with the Oregon Department of Transportation (ODOT) to increase the capacity of culverts.		<i>Protect Life and Property, Enhance Natural Systems, Augment Emergency Services</i>	
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. The La Quinta Hotel on Sun Place experienced a few inches of flooding on the first floor. 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. 			
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 Department	
Internal Partners:		External Partners:	
Engineering and Public Works Departments		ODOT, Business community, METRO, Clackamas County, Washington County	
Timeline:		If available, estimated cost:	
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)		
	Ongoing		
Form Submitted by:		Hazard Mitigation Advisory Committee	
Status		New Action, 2009	

Flood #3

Proposed Action Item:		Alignment with Plan Goals:	
Implement the recommendations found in the Stormwater Master Plan.		<i>Protect Life and Property, Enhance Natural Systems</i>	
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. 			
Ideas for Implementation:			
<ul style="list-style-type: none"> • Identify funding sources to implement recommendations. 			
Coordinating Organization:		Natural Resources	
Internal Partners:		External Partners:	
Planning and Public Works Departments		Clackamas County Water Environment Services, METRO, Department of Environmental Quality, Department of Land Conservation and Development, Department of State Lands	
Timeline:		If available, estimated cost:	
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)		
Ongoing			
Form Submitted by:		Hazard Mitigation Advisory Committee	
Status		New Action, 2009	

Severe Storm #1

Proposed Action Item:		Alignment with Plan Goals:
Reduce negative effects from severe windstorm and severe winter storm events.		<i>Protect Life and Property, Promote Public Awareness, Enhance Natural Systems, Encourage Partnerships and Implementation, Augment Emergency Services</i>
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 particular 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. 		
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. 		
Coordinating Organization:	Community Development and Public Works	
Internal Partners:		External Partners:
		PGE, Bonneville Power Administration
Timeline:		If available, estimated cost:
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)	
Ongoing		
Form Submitted by:	Hazard Mitigation Advisory Committee	
Status	New Action, 2009	

Earthquake #1

Proposed Action Item:		Alignment with Plan Goals:	
Conduct seismic evaluations on the Wastewater Treatment Plant, Community Center, and Public Works/Police Building for implementing appropriate structural mitigation strategies.		<i>Protect Life and Property, Encourage Partnerships and Implementation, Augment Emergency Services</i>	
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; 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"> ▪ 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 and Engineering Departments		Wilsonville Police, DOGAMI	
Timeline:		If available, estimated cost:	
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)		
Ongoing			
Form Submitted by:		Hazard Mitigation Advisory Committee	
Status		New Action, 2009	

Earthquake #2

Proposed Action Item:		Alignment with Plan Goals:	
Seismically retrofit Elligsen Road Fire Station and associated structures.		<i>Protect Life and Property, Encourage Partnerships and Implementation, Augment Emergency Services</i>	
Rationale for Proposed Action Item:			
<ul style="list-style-type: none"> The Elligsen Road Fire Station and associated office space were built before 1960 and have major structural and design deficiencies. Seismic concerns are significant. 			
Ideas for Implementation:			
<ul style="list-style-type: none"> Use the bond money approved by voters in November 2006 to: <ul style="list-style-type: none"> Reconstruct Elligsen Road Fire Station; and Retrofit adjacent vehicle shops and office space. 			
Coordinating Organization:		Tualatin Valley Fire & Rescue	
Internal Partners:		External Partners:	
Engineering and Building Departments		Clackamas County, Washington County	
Timeline:		If available, estimated cost:	
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)		
Ongoing			
Form Submitted by:		Hazard Mitigation Advisory Committee	
Status		New Action, 2009	

Earthquake #3

Proposed Action Item:		Alignment with Plan Goals:	
Perform non-structural mitigation on public facilities to improve life safety standards.		<i>Protect Life and Property, Encourage Partnerships and Implementation, Augment Emergency Services</i>	
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. 			
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:	
Facilities and Public Works Departments		TVF&R, Oregon Occupational Safety and Health Administration	
Timeline:		If available, estimated cost:	
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)		
Ongoing			
Form Submitted by:	Hazard Mitigation Advisory Committee		
Status	New Action, 2009		