

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:

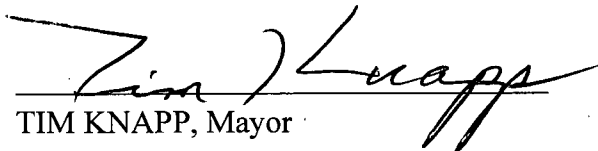
1. The City hereby gives final approval for its Addendum to the Clackamas County Multi-jurisdiction Hazard Mitigation Plan.
2. The City staff is requested to pursue available funding opportunities for the implementation of the actions and proposal designed therein.
3. The City will, upon receipt of such 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.

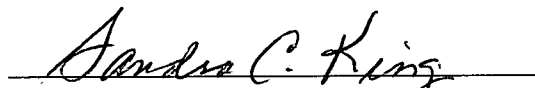
5. The City will further seek to encourage the businesses, industries and community groups operating within and/or for the benefit of the City of Wilsonville to also participate in the updating and expansion of the Clackamas County Multi-jurisdiction Hazard Mitigation Plan in the years ahead

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

U.S. Department of Homeland Security
Room 3
101 23rd Street, SW
Fathell, WA 98021-9700



FEMA

January 13, 2010

Mr. Dennis Sigris
State of Oregon
Office of Homeland Security
Oregon Emergency Management
P.O. Box 14370
Salem, Oregon 97309-5062

Dear Mr. Sigris:

As requested, the U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) has completed a pre-adoption review of the following plans:

- City of Lake Oswego Addendum to the Clackamas County Hazard Mitigation Plan
- City of Wilsonville Addendum to the Clackamas County Hazard Mitigation Plan
- City of Gold Beach Addendum to the Curry County Natural Hazard Mitigation Plan

The plans successfully contain the required criteria, excluding the adoption, for hazard mitigation plans, as outlined in 44 CFR Parts 201. This letter serves as Region 10's commitment to approve each plan upon receiving adoption documentation from its respective city.

Each plan will not be formally approved by FEMA until it is adopted. Each city is not eligible for mitigation project grants until its plan is formally approved by FEMA.

Please contact our Regional Mitigation Planning Manager, Kristen Meyers, at (425) 487-4543 with any questions.

Sincerely,

Ryan Ike
Risk Analysis Branch Chief
Mitigation Division

KM bb

**PUBLIC WORKS DEPARTMENT
STAFF REPORT**

Date: February 3, 2010

To: Honorable Mayor and City Council Members

From: Delora Kerber, Public Works Director

Subject: Final Adoption of the City of Wilsonville's Addendum to Clackamas County Multi-jurisdiction Natural Hazard Mitigation Plan

Background

At the November 16, 2009 City Council meeting, Council gave tentative approval to the City's Addendum to Clackamas County's Natural Hazard Mitigation Plan Update 2007 via Resolution 2213.

The City Addendum was then forwarded to the U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) for their pre-adoption review.

On January 13, 2010, FEMA sent a letter stating their review was complete, that we had meet all the criteria, and they were committed to giving final approval to the plan upon receiving final adoption documentation from the City.

Summary

The reason for the City to have a Natural Hazard Mitigation Plan is to help reduce future loss of life and damage to property from natural hazards such as floods, landslides, wildfires, severe storms, volcanoes and earthquakes.

The Plan provides Wilsonville with a set of goals, action items and resources designed to reduce risk from future natural disaster events. It also makes the City eligible for various FEMA mitigation grants.

Having final approval from FEMA is a requirement of eligibility for any future FEMA's Pre-Disaster Mitigation Grants, Hazard Mitigation Grants and/or Flood Mitigation Assistance Grants.

Recommendation

Staff recommends that the City Council adopts the City of Wilsonville's Addendum to the Clackamas County Multi-jurisdiction Natural Hazard Mitigation Plan.

City of



WILSONVILLE
in OREGON

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

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.

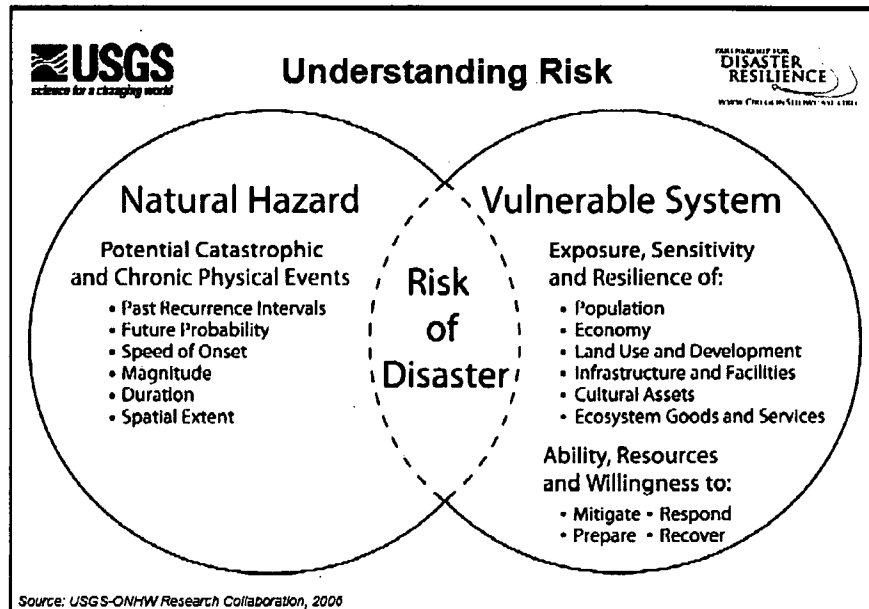
Engaging in mitigation activities provides jurisdictions with a number of benefits, including reduced loss of life, property, essential services, critical facilities and economic hardship; reduced short-term and long-term recovery and reconstruction costs; increased cooperation and communication within 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

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.

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?
- 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.

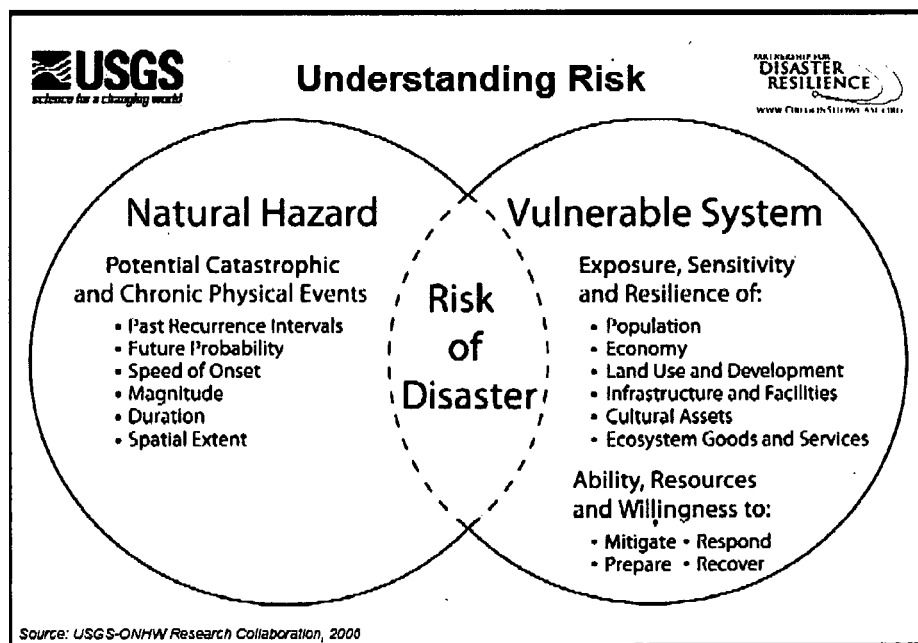
In addition to the involvement activities listed above, the city's Natural Hazards Mitigation Plan Addendum has been archived and posted on the University of Oregon Libraries' Scholar's Bank Digital Archive.² Contact information is posted on all plan copies.

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}

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pects 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^{ix}

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%

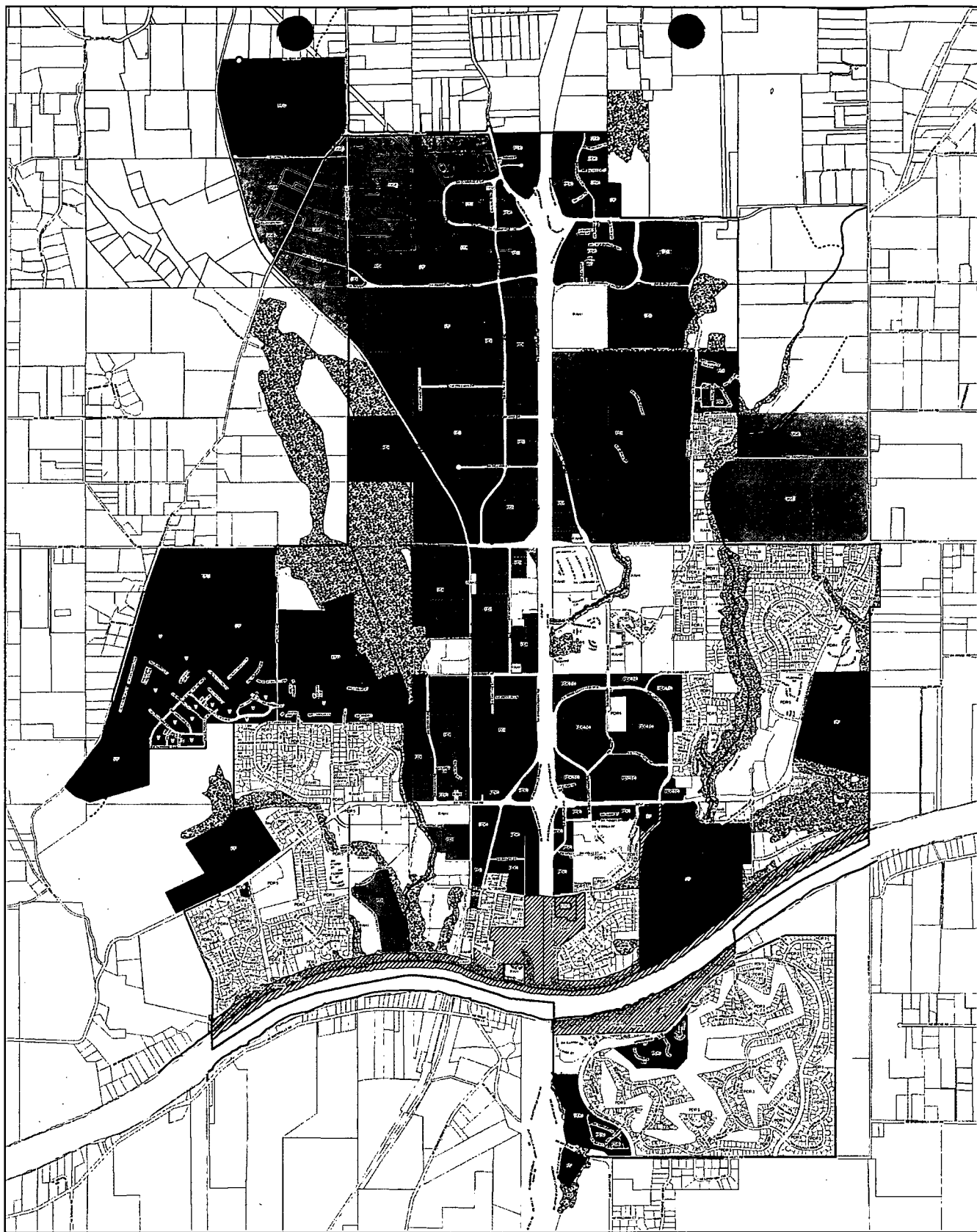
Source: US Census Bureau, 2000 Census^x

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 | Willametta River Greenway |
| Planned Development Commercial | Public Facilities - Corrections | SROZ |
| Planned Development Commercial TC | Residential | City Limits |
| Planned Development Industrial | Residential Agriculture Holding | Urban Growth Boundary |
| Planned Development Residential - 1 | Residential Agriculture Holding Commercial | Streams |
| Planned Development Residential - 2 | Residential Agriculture Holding Industrial | Intermittent |
| Planned Development Residential - 3 | Residential Agriculture Holding Public | Perennial |
| Planned Development Residential - 4 | Residential Agriculture Holding Residential | |
| Planned Development Residential - 5 | Residential Agriculture Holding Village | |
| Planned Development Residential - 6 | Urban Growth Boundary | |
| | Village | |

WILSONVILLE

GIS

 Geographic Information Systems

0 0.5 Mile

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 this 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.

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^{xy}

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 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 (to be constructed)
- 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
- Coffee 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

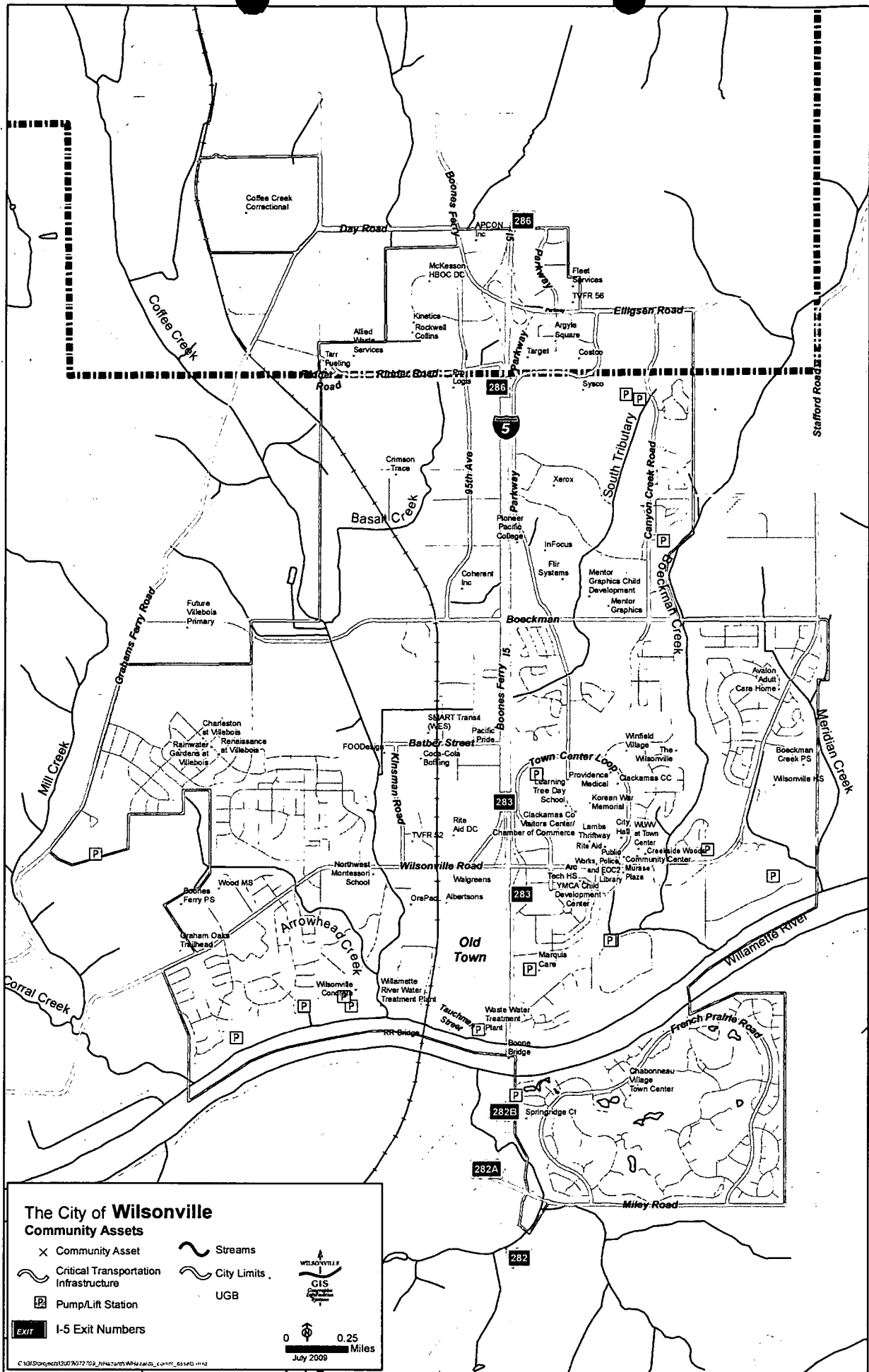
usually aligned with economic centers, and will be of particular concern for evacuation/notification during a hazard event.

- 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



**The City of Wilsonville
Community Assets**

- ✕ Community Asset
- ~ Critical Transportation Infrastructure
- Ⓟ Pump/Lift Station
- EXIT I-5 Exit Numbers
- ~ Streams
- ~ City Limits
- UGB



0 0.25 Miles
July 2009

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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

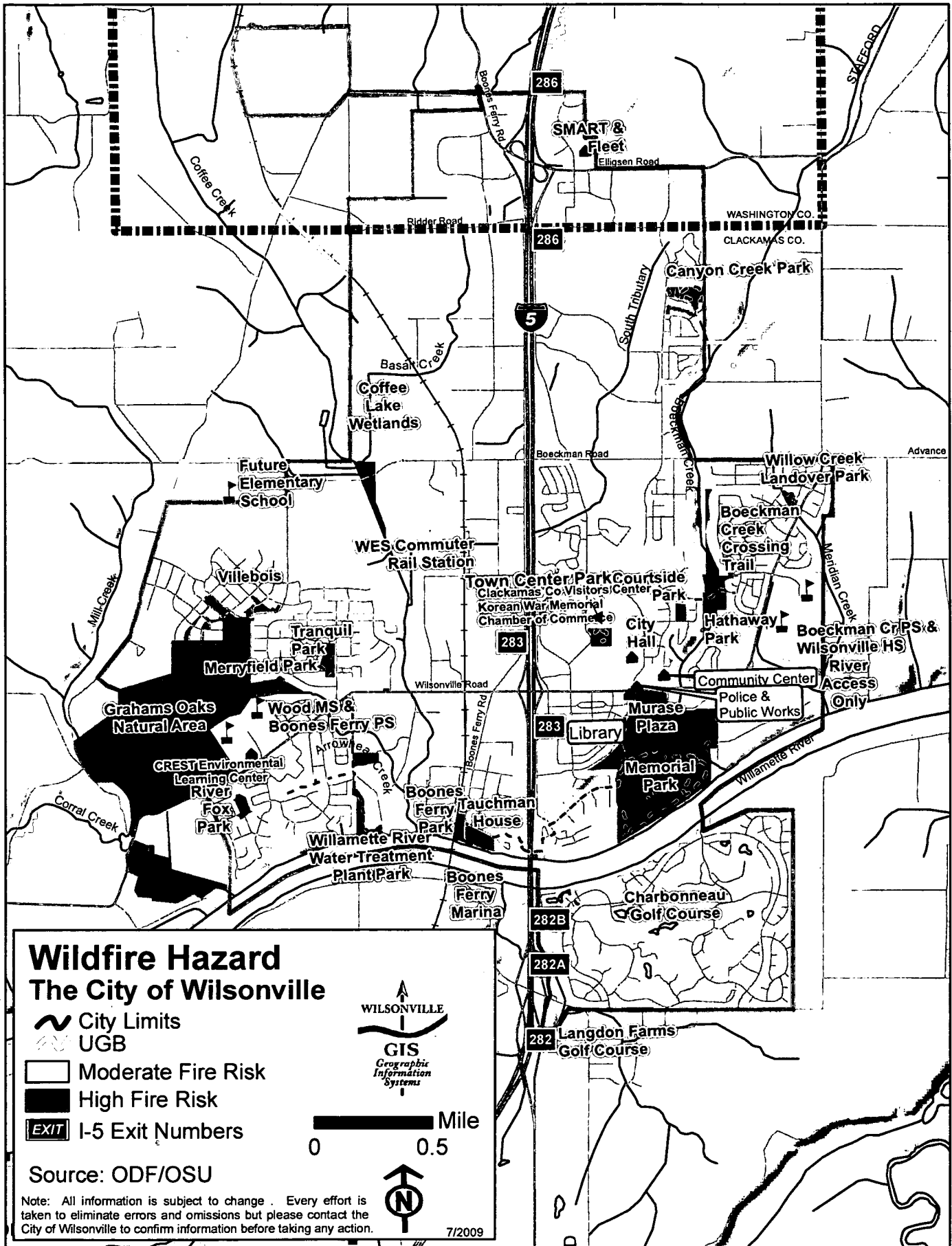
The Clackamas County Multi-Jurisdictional Natural Hazards Mitigation Plan adequately describes the causes and characteristics, location, extent and impacts of the wildfire hazard in City of Wilsonville. Descriptions of the wildfire hazard can be found on pages 8-1 to 8-16 of the 2002 Clackamas County 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 underground, 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 &

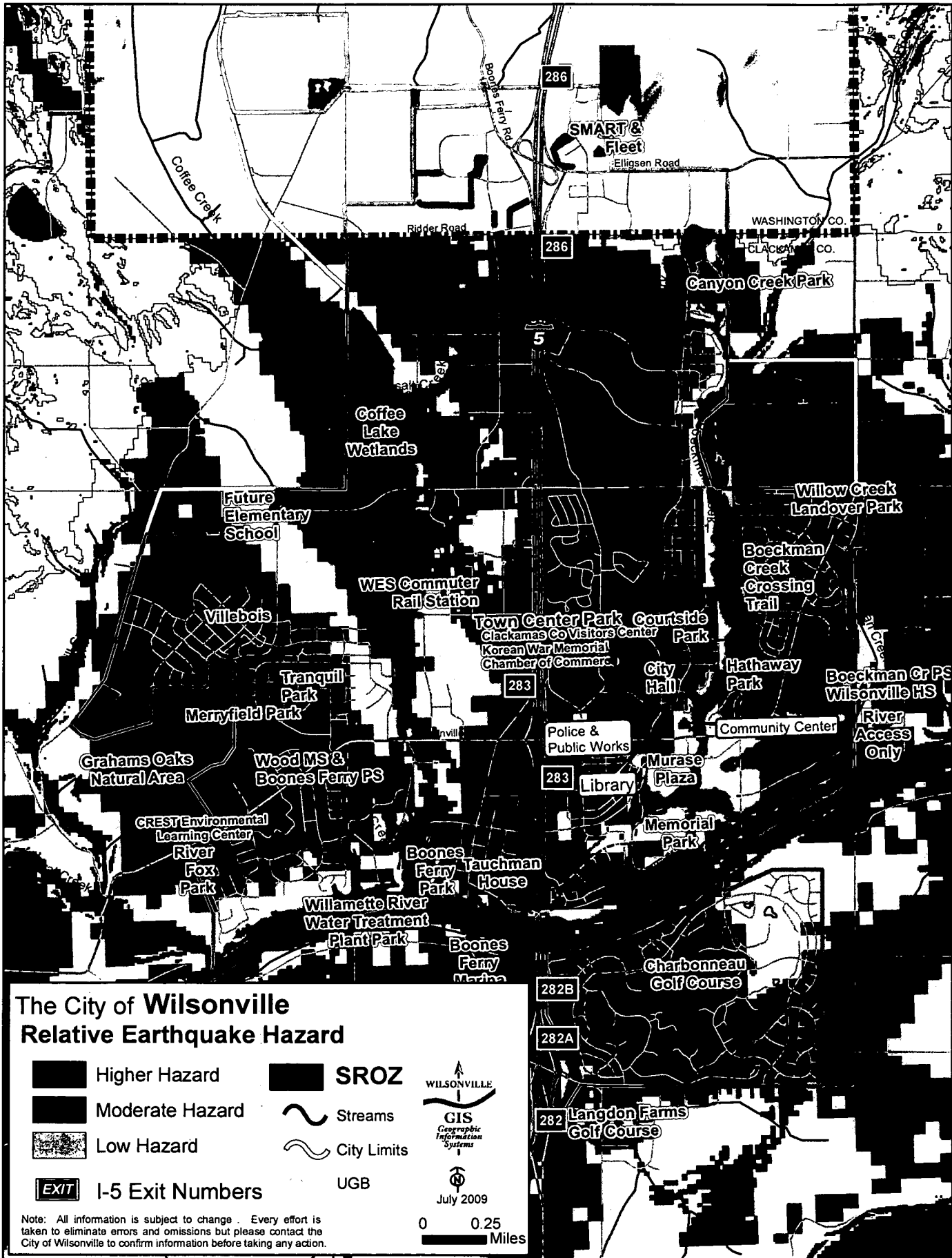
Systems, Inc., Pacific Pride, WES commuter rail station, Mentor Graphics Child Development Center, and a pump/lift station. Another large high earthquake hazard area is located within Charbonneau and includes the Charbonneau Village Town Center. The final community asset located within a high earthquake 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
- I-5 Exit Numbers
- SROZ
- Streams
- City Limits
- UGB



July 2009

0 0.25 Miles

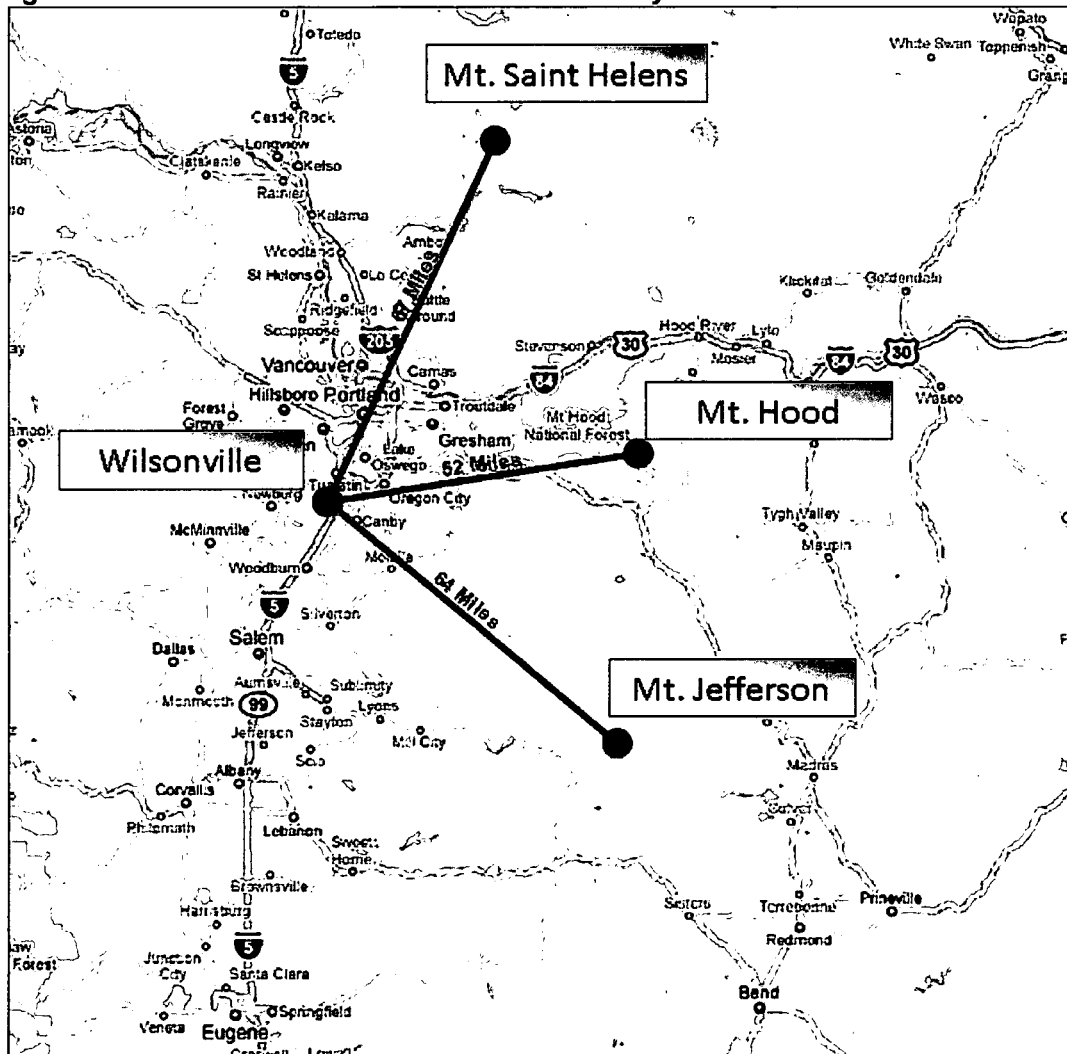
Note: All information is subject to change. Every effort is taken to eliminate errors and omissions but please contact the City of Wilsonville to confirm information before taking any action.

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.

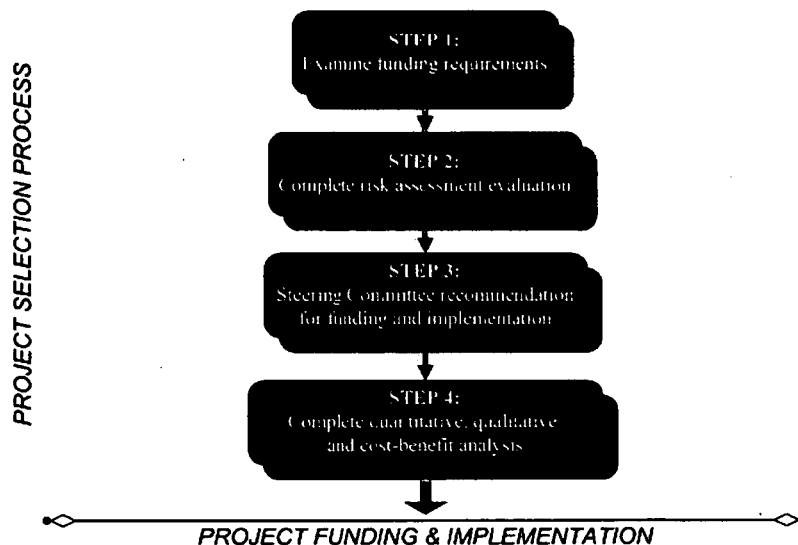
Note: the City of Wilsonville does not believe that implementing landslide and volcano-related mitigation activities will be cost-effective at this time. As such, the city has not identified volcanic-eruption mitigation action items. Wilsonville will partner with Clackamas County, however, on the implementation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

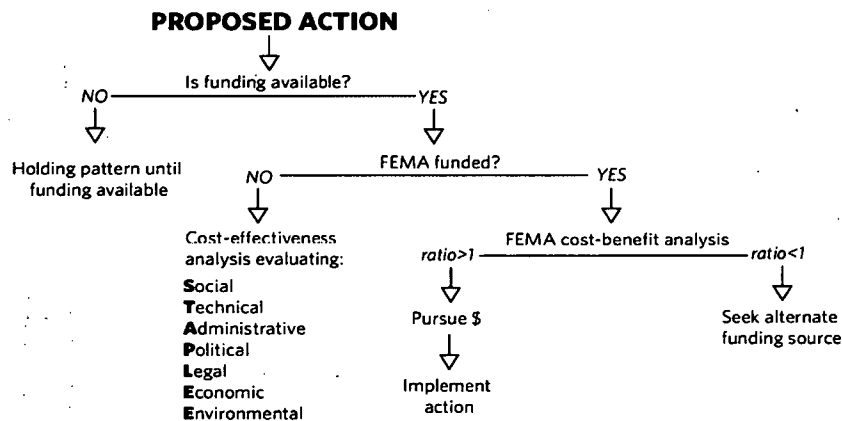
Based on the steps above, the HMAC will recommend which mitigation activities should be moved forward. If the HMAC decides to move forward with an action, the coordinating organization designated on the action item form will be responsible for taking further action and, if applicable, documenting success 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://ridsmart.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*.