Oregon
Theodore R. Kulongoski, Governor

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NOTICE OF ADOPTED AMENDMENT

April 19, 2006

TO: Subscribers to Notice of Adopted Plan or Land Use Regulation Amendments

FROM: Mara Ulloa, Plan Amendment Program Specialist

SUBJECT: City of Cottage Grove Plan Amendment
DLCD File Number 001-06

The Department of Land Conservation and Development (DLCD) received the attached notice of adoption. Due to the size of amended material submitted, a complete copy has not been attached. Copies of the adopted plan amendment are available for review at DLCD offices in Salem, the applicable field office, and at the local government office.

Appeal Procedures*

DLCD ACKNOWLEDGMENT OR DEADLINE TO APPEAL: May 5, 2006

This amendment was not submitted to DLCD for review prior to adoption. Pursuant to OAR 660-18-060, the Director or any person is eligible to appeal this action to LUBA under ORS 197.830 to 197.845.

If you wish to appeal, you must file a notice of intent to appeal with the Land Use Board of Appeals (LUBA) no later than 21 days from the date the decision was mailed to you by the local government. If you have questions, check with the local government to determine the appeal deadline. Copies of the notice of intent to appeal must be served upon the local government and others who received written notice of the final decision from the local government. The notice of intent to appeal must be served and filed in the form and manner prescribed by LUBA, (OAR Chapter 661, Division 10). Please call LUBA at 503-373-1265, if you have questions about appeal procedures.

***NOTE:** **THE APPEAL DEADLINE IS BASED UPON THE DATE THE DECISION WAS MAILED BY LOCAL GOVERNMENT. A DECISION MAY HAVE BEEN MAILED TO YOU ON A DIFFERENT DATE THAN IT WAS MAILED TO DLCD. AS A RESULT YOUR APPEAL DEADLINE MAY BE EARLIER THAN THE DATE SPECIFIED ABOVE.**

Cc: Gloria Gardiner, DLCD Urban Planning Specialist
Marguerite Nabeta, DLCD Regional Representative
Howard Schesser, City of Cottage Grove

<paa>

FORM 2

D L C D NOTICE OF ADOPTION

This form **must be mailed** to DLCD **within 5 working days after the final decision**
per ORS 197.610, OAR Chapter 660 - Division 18

(See reverse side for submittal requirements)

DEPT OF

APR 14 2006

LAND CONSERVATION AND DEVELOPMENT

Jurisdiction: City of Cottage Grove Local File No.: ____ (If no number, use none)

Date of Adoption: 12/19/05 (Must be filled in) Date Mailed: 4/13/06 (Date mailed or sent to DLCD)

Date the Notice of Proposed Amendment was mailed to DLCD: n/a

___ Comprehensive Plan Text Amendment
___ Comprehensive Plan Map Amendment
___ Land Use Regulation Amendment
___ Zoning Map Amendment
___ New Land Use Regulation
✓ Other: Natural Hazard Mitigation Plan (Please Specify Type of Action)

Summarize the adopted amendment. Do not use technical terms. Do not write "See Attached."

The city adopted a Natural Hazards Mitigation Plan which was approved by FEMA and is required in order to recieve mitigation funds. The plan addresses hazard risk and mitigation action items.

Describe how the adopted amendment differs from the proposed amendment. If it is the same, write "Same." If you did not give notice for the proposed amendment, write "N/A."

N/A

Plan Map Changed from : ____ to ____

Zone Map Changed from: ____ to ____

Location: ____ Acres Involved: ____

Specify Density: Previous: ____ New: ____

Applicable Statewide Planning Goals: 1, 2, 7

Was an Exception Adopted? Yes: ____ No: ✓

DLCD File No.: 001-06 (NOA)

RESOLUTION NO. 1586

A RESOLUTION ADOPTING
THE COTTAGE GROVE NATURAL HAZARDS MITIGATION PLAN

WHEREAS, a Natural Hazards Mitigation Plan has been prepared by the City in compliance with the criteria outlined in 44 CFR Part 201; and,

WHEREAS, the Natural Hazards Mitigation Plan includes resources and information to assist the city government, residents, public and private sector organizations, and others interested in participating in planning for natural hazards; and

WHEREAS, the Natural Hazards Mitigation Plan provides a list of activities that may assist the City of Cottage Grove in reducing risk and preventing loss from future hazard; and,

WHEREAS, the Natural Hazards Mitigation Plan is a collaborative effort between the City of Cottage Grove and local stakeholders. The Natural Hazards Mitigation Plan Team was formed in February 2003 and assisted in the preparation of this; and

WHEREAS, the plan has been reviewed at a public meeting, and a public hearing before the Planning Commission; and

WHEREAS, with approval of this plan by the City and the Federal Emergency Management Agency (FEMA) the City will gain eligibility for the Pre-Disaster Mitigation Grant Program, the Hazard Mitigation Grant Program, and the Flood Mitigation Assistance Program; and

WHEREAS, the Natural Hazards Mitigation Plan has been reviewed by the Oregon State Office of Emergency Management and Region X of FEMA; and

WHEREAS, Region X of FEMA approved the Natural Hazards Mitigation Plan on November 25, 2005 subject to the adoption of the plan by the City Council of the City of Cottage Grove; and

NOW, THEREFORE, BE IT RESOLVED that the *Natural Hazard Mitigation Plan*, Spring 2005, set forth in Exhibit "A" is hereby adopted.

This resolution will take effect immediately.

PASSED BY THE COMMON COUNCIL AND APPROVED BY THE MAYOR THIS 19th DAY OF December, 2005

ATTEST:

Richard Meyers, City Manager
Date: Dec 19, 2005

APPROVED:

Gary Williams, Mayor
Date: Dec. 20, 2005

City of Cottage Grove

Natural Hazards Mitigation Plan

Spring 2005

City of Cottage Grove Natural Hazard Mitigation Plan
Table of Contents

Section 1: Planning Process

The City of Cottage Grove Natural Hazard Mitigation Plan includes resources and information to assist the city government, residents, public and private sector organizations, and others interested in participating in planning for natural hazards. The mitigation plan provides a list of activities that may assist the City of Cottage Grove in reducing risk and preventing loss from future hazard events. The City of Cottage Grove has developed this Plan as an addendum to the Lane County Multi-Hazard Mitigation Plan in an effort to take a more regional approach to planning for natural hazard scenarios.

Plan Development Participation

The City of Cottage Grove Natural Hazards Mitigation Plan is a collaborative effort between the City of Cottage Grove and local stakeholders. The Natural Hazards Mitigation Plan Team was formed in February of 2003 and serves to provide guidance and direction in the natural hazards mitigation planning process. Members of the Natural Hazards Mitigation Plan Team includes:

- Amanda Ferguson, Assistant Planner, City of Cottage Grove
- Andy McClean, Fire Marshal, South Lane County Fire & Rescue
- Bob Sisson, Public Works Director, City of Cottage Grove
- Bryan von Bargen, Natural Resources Manager, US Army Corps of Engineers, Willamette Valley Project
- Gary Bood, Building Official, City of Cottage Grove
- Howard Schesser, Emergency Manager, City of Cottage Grove
- Jana Fox, Intern, City of Cottage Grove
- Lindsey Haskel, Councilor, Cottage Grove City Council
- Marie Longfellow, Member, Cottage Grove Historical Society
- Matt Parsons, Treasurer, Cottage Grove Area Chamber of Commerce
- Phillip Jones, Member, Coast Fork Willamette Watershed Council

Multi-Jurisdictional Planning Effort

The City of Cottage Grove is committed to regional hazard planning. The City has a representative on the Lane County Countywide Preparedness Group and takes part in regional meetings and exercises. This involvement ensures that the City is represented in broader scale natural hazard planning activities. The City of Cottage Grove also partnered with the Lane Council of Governments (LCOG) to create natural hazard maps for the City of Cottage Grove Natural Hazards Mitigation Plan. The City will continue to partner with other agencies on the local, county, state, and federal level in order to effectively mitigate loss to life and property from natural hazards.

Planning Process

A draft of the Cottage Grove Natural Hazards Mitigation Plan was written and submitted to the members of the Natural Hazards Mitigation Plan Team for

review. A Plan Team meeting was scheduled for discussion and review of the plan. A public meeting was held for comment on the plan and action items before the plan was finalized and submitted to the Cottage Grove City Council

Plan Mission

The mission of the City of Cottage Grove Natural Hazards Mitigation Plan is to promote sound public policy designed to protect citizens, critical facilities, infrastructure, and property from natural hazards. This can be achieved by increasing public awareness, documenting resources for risk reduction and loss-prevention, and identifying activities to guide the City towards a safer, more sustainable community.

Plan Goals

The plan goals provide guidance in developing specific action items from the general mission statement. The goals describe the overall direction the City of Cottage Grove desires to work towards in mitigating the effects of natural hazards.

Protect Life and Property

- Implement activities that assist in protecting life and property from losses due to natural hazards.
- Reduce losses and repetitive damage from chronic hazard events.
- Improve hazard assessment information to make recommendations for discouraging new development in areas vulnerable to natural hazards.
- Encourage preventative measures in existing vulnerable areas.

Public Awareness

- Develop and implement educational outreach programs to increase public awareness of the hazards associated with natural disasters.
- Provide information on tools, partnerships, and funding resources to assist in implementing hazard mitigation actions.

Emergency Services

- Establish policy to ensure mitigation for critical facilities, services, and infrastructure.
- Coordinate and integrate natural hazard mitigation activities with emergency operations plans and procedures.

Partnerships and Implementation

- Strengthen communication and coordinate participation among and within public agencies, citizens, non-profit organizations, businesses, and industry.
- Encourage leadership within the public and private sectors to prioritize and implement local, county, and regional hazard mitigation activities.

State/National Guidelines

- Meet the Federal Emergency Management Associations (FEMA) mitigation planning requirements so Cottage Grove remains eligible for pre- and post-disaster mitigation funding from FEMA,
- Explore FEMA Flood Insurance Program's Community Rating System guidelines, to help minimize future flood insurance rates in Cottage Grove,
- Meet Oregon Emergency Management's mitigation planning evaluation criteria, and
- Meet Oregon's Goal 7 natural hazard planning guidelines.

Plan Implementation, Maintenance, and Public Participation

The plan maintenance section of this document details the formal process that will ensure that The City of Cottage Grove Natural Hazards Mitigation Plan remains an active and relevant document. The plan maintenance process includes a schedule for monitoring and evaluating the Plan annually and producing an updated plan every five years. This section also describes how the City will integrate public participation throughout the plan maintenance and implementation process. Finally, this section includes an explanation of how the City intends to incorporate the mitigation strategies outlined in this Plan into existing planning mechanisms and programs such as the City of Cottage Grove comprehensive land use planning process, capital improvement planning process, and building codes enforcement and implementation.

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 current and relevant to Cottage Grove.

Plan Adoption

The Cottage Grove City Council is responsible for adopting the City of Cottage Grove Natural Hazards Mitigation Plan as well as the Lane County Multi-Hazard Mitigation Plan as an addendum to the Cottage Grove Plan. The Cottage Grove City Council has the authority to promote sound public policy regarding natural hazards.

Plan Implementation

After the plan is adopted via resolution by the Cottage Grove City Council, the Community Development Director or their designee will be responsible for submitting it to the State Hazard Mitigation Officer at Oregon Emergency Management. Oregon Emergency Management will then submit the plan to the Federal Emergency Management Agency (FEMA–Region X) for review. This review will address the federal criteria outlined in FEMA Interim Final Rule 44 CFR Part 201. Upon acceptance by FEMA, the City will gain eligibility for the Pre-Disaster Mitigation Grant Program, the Hazard Mitigation Grant Program funds, and Flood Mitigation Assistance program funds. The Plan Team will remain intact after the plan is adopted and focus its efforts on plan implementation and maintenance. The Plan Team will serves as the coordinating

body for implementation and plan updates. This coordinating group's role is described in detail later in this document. The City of Cottage Grove Community Development Department will serve as the convener of the Plan Team.

The effectiveness of the City's non-regulatory Natural Hazard Mitigation Plan will be contingent on the implementation of the plan and incorporation of the outlined action items into existing City plans, policies, and programs. The Natural Hazard Mitigation Plan includes a range of action items that, if implemented, would reduce loss from hazard events in the City of Cottage Grove. Together, the action items in the City of Cottage Grove Natural Hazard Mitigation Plan provide the framework for activities that city bureaus can choose to implement over the next five years. The Plan Team has prioritized the plan's goals and action items, which will be implemented, as resources permit, through existing plans, policies, and programs.

Coordinating Body

The Plan Team will be the coordinating body for the mitigation plan. The City of Cottage Grove Natural Hazards Mitigation Plan is a collaborative effort between the City of Cottage Grove and local stakeholders. The Natural Hazards Mitigation Plan Team was formed in February of 2003 and serves to provide guidance and direction in the natural hazards mitigation planning process. Members of the Natural Hazards Mitigation Plan Team includes:

- Amanda Ferguson, Assistant Planner, City of Cottage Grove
- Andy McClean, Fire Marshal, South Lane County Fire & Rescue
- Bob Sisson, Public Works Director, City of Cottage Grove
- Bryan von Bargen, Natural Resources Manager, US Army Corps of Engineers, Willamette Valley Project
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- Matt Parsons, Treasurer, Cottage Grove Area Chamber of Commerce
- Phillip Jones, Member, Coast Fork Willamette Watershed Council

To make the coordination and review of the City of Cottage Grove Natural Hazard Mitigation Plan as broad and useful as possible, the Plan Team will engage additional stakeholders and other relevant hazard mitigation organizations and agencies to implement the identified action items. The members of this review board are (but not limited to):

- The Plan Team
- The Cottage Grove City Council
    - Michael Fleck
    - Lindsey Haskell

- Robert Hunt
- Lynn Miller
- Pat Patterson
- Gary Williams
- Todd Winter

Convener
The Community Development Director for the City of Cottage Grove, or their designee, will serve as a convener to facilitate the Natural Hazards Mitigation Plan Team meetings and will be responsible for assigning tasks to committee members. The convener will be responsible for presenting the Plan to the Plan Team as well as the City Council. Implementation of the Plan is the responsibility of the City of Cottage Grove.

Implementation Through Existing Programs
The Natural Hazard Mitigation Plan includes a range of action items that, when implemented, will reduce loss from hazard events in Cottage Grove. Within the framework of the plan, FEMA requires the identification of existing programs that might be used to implement these action items. The City of Cottage Grove addresses statewide planning goals and legislative requirements through its Comprehensive Plan, Emergency Operations Plan, and Building Codes. The Natural Hazards Mitigation Plan provides recommendations that are tied to the goals of the existing plans and programs. The City of Cottage Grove will be able to implement action items through existing programs and procedures, as well as apply for additional assistance for projects requiring funding currently outside existing programs.

Plan Maintenance
Plan maintenance is a critical component of the natural hazard mitigation plan. Proper maintenance of the plan will ensure that this plan will benefit Cottage Grove's efforts to reduce the risks posed by natural hazards. This section was developed by the University of Oregon's Oregon Natural Hazards Workgroup and presents a process to ensure that a regular review and update of the plan occurs. The Plan Team and local staff will be responsible implementing this process in addition to maintaining and updating the plan through a series of meetings outlined in the maintenance schedule below.

Table 5.1: Plan Maintenance Meeting Schedule

Semi-Annual Meeting	Annual Meeting	Five-Year Review
Review Current Actions	Update Risk Assessment Data and Findings	Review plan update questions
Identify New Issues and Needs	Discussion of Methods of Continued Public Involvement	Update plan sections as necessary
Prioritize Potential Projects	Documenting Successes and Lessons Learned	

Semi-Annual Meetings
The Plan Team will meet on a semi-annual basis to:

- Review existing action items to determine appropriateness for funding;
- Identify issues that may not have been identified when the plan was developed; and
- Prioritize potential mitigation projects using the methodology described below

The convener will be responsible for documenting the outcome of the semi-annual meetings. The process the Committee will use to prioritize mitigation projects is detailed in the section below.

Project Prioritization Process
The requirements of Disaster Mitigation Act of 2000 through the Pre-Disaster Mitigation Program state that the plan must identify a process for prioritizing potential actions. Potential mitigation activities will often come from a variety of sources; therefore project prioritization process needs to be flexible. Examples of the methods in which projects may be identified include: Committee members, local government staff, other planning documents, or the Risk Assessment. Depending on the potential project's intent and implementation methods, several funding sources may be appropriate. 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, National Fire Plan (NFP), Title II funds, Title III funds, Community Development Block Grants (CDBG), local general funds, private foundations, among other. Some of these examples are used in the figure below to illustrate the project prioritization process. The prioritization process utilizes a four step process to prioritize activities to help ensure that mitigation dollars are used in a cost–effective manor.

Step 1: Examine Funding Requirements
The committee will examine the selected funding stream's requirements to ensure that the mitigation activity would be eligible through the funding source. The committee may consult with the funding entity, Oregon Emergency Management, or other appropriate state or regional organization about the project's eligibility.

Step 2: Complete Risk Assessment Evaluation
The second step in prioritizing the plan's action items was to examine which hazards they are associated with and where these hazards rank in terms of community risk. The committee will determine whether or not the plan's Risk Assessment supports the implementation of the mitigation activity. This determination will be based on the location of the potential activity and the proximity to known hazard areas, historic hazard occurrence, and the probability of future occurrence documented in the

plan. To rank the hazards, community's natural hazard risk assessment was utilized. This risk assessment identified various hazards that may threaten community facilities in a range from:

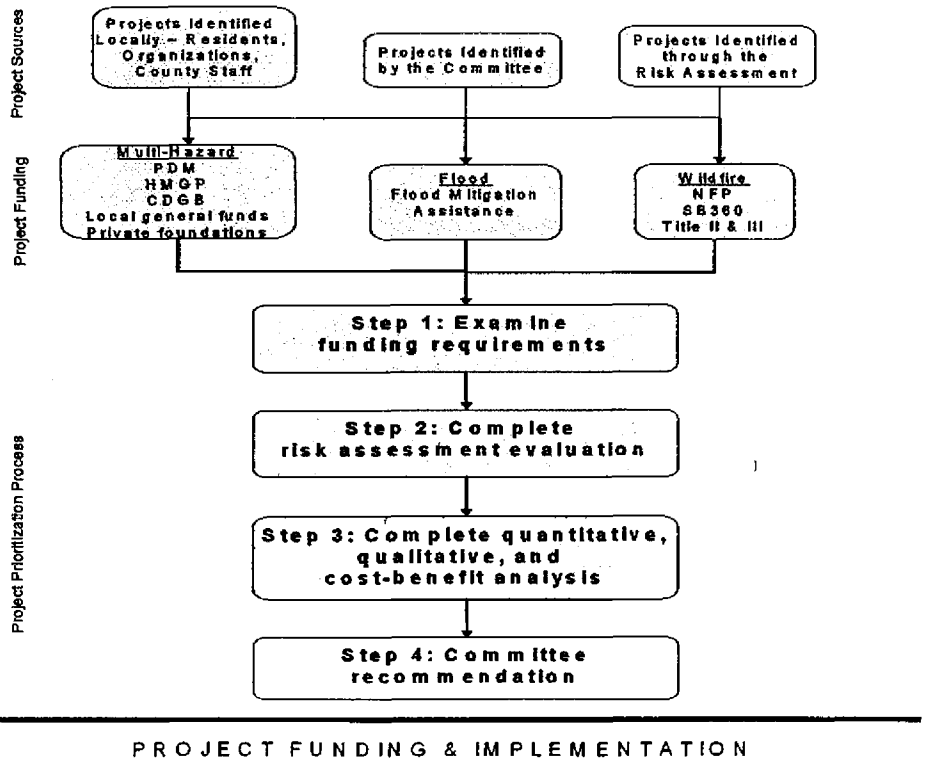
- No/Low
- Limited
- Moderate
- High
- Severe

The rank ordering of hazards by risk follows:

1. Flood
2. Winter Storm
3. Earthquake
4. Wildfire
5. Landside
6. Volcano

Each of the action items in the plan addresses risk from one or more of these hazards.

Figure 5.1: Project Prioritization Process Overview (Source: ONHW/CPW, 2005)



Step 3: Complete Quantitative, Qualitative Assessment, and Economic Analysis

Depending on the type of project and the funding source, either a quantitative or qualitative assessment of cost effectiveness will be completed to assist in prioritizing potential actions. Conducting benefit/cost analysis for a mitigation activity can assist communities 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.

If the activity is seeking federal funding for a structural project the committee will use a FEMA-approved cost-benefit analysis tool to evaluate the appropriateness of the activity. See *Appendix X: Economic Analysis of Natural Hazard Mitigation Projects* for a description of the FEMA-approved cost-benefit analysis. A project must have a benefit cost ratio of greater than 1 in order to be eligible for FEMA funding.

For FEMA-funded non-structural projects or projects funded through entities other than FEMA, a qualitative assessment will be completed to determine the project's cost effectiveness. The committee will use a multi-variable assessment technique called STAPLE/E to prioritizing 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. The STAPLE/E technique has been tailored for natural hazard action item prioritization by the University of Oregon's Oregon Natural Hazards Workgroup. See *Appendix X: Economic Analysis of Natural Hazard Mitigation Projects* for a description of the STAPLE/E evaluation methodology.

Step 4: Committee Recommendation

Based on the steps above, the committee will recommend whether or not the mitigation activity should be moved forward. If the committee decides to move forward with the action, the coordinating organization designated for the activity will be responsible for taking further action and document success upon project completion. Hazard Mitigation Advisory Committee will convene a meeting to review the issues surrounding grant applications and shared knowledge and or resources. This process will afford greater coordination and les competition for limited funds.

The Hazard Mitigation Advisory Committee and the community's leadership have the option to implement any of the action items at any time, (regardless or the prioritized order). This allows the committee to consider mitigation strategies as new opportunities arise, such as funding for action items that may not be of highest priority. This methodology used by the Hazard Mitigation Steering Committee to initially prioritize the plan's action items in addition to maintaining the action list during annual review and update.

Annual Meeting
The Committee will meet annually to review updates of the Risk Assessment data and findings, discuss methods of continued public involvement, and document successes and lessons learned based on actions that were accomplished during the past year. The convener will be responsible for documenting the outcomes of the annual.

Five Year Review of Plan
This plan will be updated every five years in accordance with the update schedule outlined in the Disaster Mitigation Act of 2000. During this plan update, the following questions should be asked to determine what actions are necessary to update the plan. The convener will be responsible for convening the Committee to address the questions outlined below.

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

The questions above will help the committee determine what components of the mitigation plan need updating. The Committee will be responsible for updating any deficiencies found in the plan based on the questions above.

Continued Public Involvement and Participation

The City of Cottage Grove is dedicated to involving the public directly in the continual reshaping and updating of the Natural Hazard Mitigation Plan. Although members of the Plan Team represent the public to some extent, the public will have the opportunity to provide feedback about the Plan.

During plan development, public participation was incorporated into every stage of the plan development process. The City of Cottage Grove is dedicated to involving the community in the Natural Hazards Mitigation planning process. A public open house was held in order to allow the public to comment on action items and the Natural Hazard Mitigation Plan. The public will have the opportunity to submit comments on the plan to the Community Development Department at any time. Copies of the plan will be kept in the Community Development Department, the Cottage Grove Public Library, and online at http://www.cottagegrove.org.

Economic Analysis of Mitigation Projects

The FEMA approaches to identify the costs and benefits associated with natural hazard mitigation strategies, measures, or projects fall into two general categories: benefit/cost analysis and cost-effectiveness analysis. Conducting benefit/cost analysis for a mitigation activity can assist the City of Cottage Grove in determining whether a project is worth undertaking now, in order to avoid disaster-related damages and costs 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 can provide 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.

The City of Cottage Grove will use a system scoring plan goals addressed and natural hazard prioritization scores to analyze and prioritize mitigation action items.

Mitigation Strategies Identified by the City of Cottage Grove

The action items are a listing of activities in which City and County agencies and citizens may be involved in to reduce risk. Each action item includes an estimated timeline for implementation. Short-term action items (ST) are activities that agencies may implement within one to two years. Long-term action items (LT) may require new or additional resources and may take between one and five years to implement. The action items are organized within Table 1-1, Natural

Hazard Action Item Matrix, which contains all of the multi-hazard and hazard-specific action items that are included in the mitigation plan.

	Action Item	Coordinating Agency	Timeline	Ideas for Implementation	Plan Goals Addressed	Protection of Life and Property	Public Awareness	Emergency Services	Partnerships and Implementation
Long Term Multi-Hazard #1	Complete inventories of buildings and infrastructure at risk from each hazard and prioritize mitigation projects to reduce the level of risk.	Community Development	3-5 years	p. 37		✔	✔	✔	
Long Term Multi-Hazard #2	Identify and pursue funding opportunities to develop and implement specific mitigation projects in Cottage Grove.	Community Development	3-5 years	p. 37		✔	✔	✔	✔
Short Term Multi-Hazard #3	Strengthen emergency preparedness and response capabilities.	Community Development	1-2 years	p. 37		✔	✔	✔	✔
Short Term Multi-Hazard #4	Integrate the information, objectives, mitigation strategies and action items into existing regulatory documents and programs.	Community Development	1-2 years	p. 38		✔		✔	✔
Short Term Multi-Hazard #5	Update the Comprehensive Plan to meet State Land Use Planning Goal 7.	Community Development	1-2 years	p. 38		✔		✔	✔
Long Term Multi-Hazard #6	Enhance community awareness of natural hazards.	Community Development	Ongoing	p. 38		✔	✔	✔	✔
Long Term Multi-Hazard #7	Increase the medical resources capable of handling large-scale medical needs.	Community Development	Ongoing	p. 39		✔	✔	✔	✔
Short Term Multi-Hazard #8	Ensure that there are adequate shelter facilities in hazard-free zones to serve Cottage Grove residents.	Community Development/ Library	Ongoing	p. 39		✔	✔	✔	✔
Short Term Flood #1	Investigate FEMA's Community Rating System requirements to potentially lower flood insurance rates.	Community Development	1 year	p. 21		✔	✔		✔
Long Term Flood #2	Improve upon localized flood hazard knowledge.	Community Development	Ongoing	p. 22		✔	✔	✔	✔
Short Term Flood #3	Inventory structures and infrastructure in the FEMA mapped floodway and explore mitigation options.	Community Development	1-2 years	p. 22		✔	✔	✔	✔
Long Term Flood #4	Address concerns associated with development in areas with high water tables.	Community Development	3-5 years	p. 22		✔	✔		✔
Long Term Flood #5	Increase channel maintenance and debris removal from rivers and streams.	Community Development	Ongoing	p. 23		✔	✔	✔	✔

Natural Hazard	Action Item	Coordinating Agency	Timeline	Ideas for Implementation	Plan Goals Addressed	Protection of Life and Property	Public Awareness	Emergency Services	Partnerships and Implementation
Short Term Flood #6	Create Storm Water Management Plan, determine and implement appropriate mitigation measures.	Public Works	1-2 years	p. 23		✓		✓	✓
Short Term Flood #7	Improve public notification system in case of a dam failure.	Community Development	1-2 years	p. 23		✓	✓	✓	✓
Long Term Winter Storm #1	Decrease risk of power and utility outages by moving lines underground.	Public Works	Ongoing	p. 31		✓	✓	✓	✓
Long Term Winter Storm #2	Periodically survey trees on city property and trim as necessary.	Public Works	Ongoing	p. 32		✓		✓	✓
Long Term Winter Storm #3	Ensure that critical facilities have backup power and emergency operations plans to deal with power outages.	Community Development	Ongoing	p. 32		✓		✓	✓
Long Term Landslide #1	Evaluate risk level for buildings identified in the landslide hazard area.	Community Development	3-5 years	p. 25		✓	✓		✓
Short Term Landslide #2	Limit future development in high landslide potential areas.	Community Development	1-2 years	p. 25		✓	✓	✓	✓
Short Term Landslide #3	Adopt erosion control regulations for all development, especially in high landslide hazard areas.	Community Development	1-2 years	P. 26		✓	✓	✓	✓
Long Term Wildland Fire #1	Encourage fire-safe construction practices for existing and new construction in high-risk areas.	Community Development	Ongoing	p. 29		✓	✓	✓	✓
Long Term Earthquake #1	Complete inventory or residential, commercial, and public buildings in Cottage Grove that may be particularly vulnerable to earthquake damage, including (but not limited to) unreinforced masonry buildings and wood frame buildings with cripple wall foundations and with sill plates not bolted to the foundation.	Community Development	3-5 years	p. 34		✓	✓		✓
Long Term Earthquake #2	Complete seismic vulnerability assessments and develop mitigation strategies of seismic retrofit for critical public buildings identified as being particularly vulnerable.	Community Development	3-5 years	p. 35		✓	✓	✓	✓
Short Term Earthquake #3	Study and make necessary improvements to the water transmission line from Layng Creek.	Community Development	1-2 years	p. 35		✓		✓	✓

Section 2: Community Profile

History

Cottage Grove, known as the *Covered Bridge Capital of Oregon*, is located approximately 20 miles south of Eugene. The city is bisected by Interstate 5 (I-5), with its downtown situated west of the interstate. Cottage Grove is a friendly, recreation-and-family-oriented town. The city's tree-covered hillsides, river greenways, water courses, natural vegetation, and colorful heritage add variety and give the urban area its distinctive form and livability.

In 1853, early Cottage Grove settlers built the first sawmill in the area that is now Dorena Lake. Four years later, Harvey Hazelton built the region's first commercial mill on Silk Creek. The post office, originally located near Creswell, kept moving south until it was established in what became known as Cottage Grove. The Cottage Grove Post Office was so named because it originally operated near Creswell out of a cottage in a grove or trees. The City of Cottage Grove, named after the post office, officially incorporated in 1887.

Over the past 50 years, the city has experienced steady growth. The 2004 population was 9,010, almost triple what is was in 1950-3,535.

Early settlers farmed in and around the Cottage Grove area, raising sheep and cattle and growing fruits, vegetables, and grasses. The population of the area began to increase significantly after 1858 when gold was discovered 30 miles east of the present city. While the Civil War put extraction activity on hold briefly, this discovery lured thousands of prospectors to the area. In 1871, the Oregon and California Railroad reached Cottage Grove and expanded the city's access to markets. Originally, the town was on the west side of the river. When the railroad came, it spurred growth down Main Street toward the tracks and the stretch between the river and the railroad tracks became the downtown core. By the end of the nineteenth century, Cottage Grove had begun developing its timber-based economy and its population grew quickly.

Historically, the timber industry supported families in and around the city. Through the years, Cottage Grove diversified and expanded its lumber and wood product industries. Since the mid 1980's, this sector has been in decline. Agricultural activities currently play a minor role in the economy. Recreation and tourism have recently become more of a focus, partly due to the presence of six historic covered bridges in the area. Flood control reservoirs build in the late 1940's provide the superb recreational opportunities now available at Dorena and Cottage Grove Lakes. Cottage Grove and Dorena dams are part of a system that controls 28 percent of the water flow in the Willamette Watershed.

Current Conditions

Cottage Grove, the largest city along I-5 between Eugene and Roseburg, is also the largest city within the 655 square-mile Coast Fork Watershed. It serves as the area's major commercial center.

Due to the city's location at the outer end of a comfortable commute to the metro area, Cottage Grove has the feeling of a relatively self-contained, independent community. Despite its size and relative independence, the city has struggled in recent years to sustain its economy, and Cottage Grove residents now depend heavily on the metro area for employment.

In 1997, close to 1,000 residents, one out of every eight persons, received unemployment insurance benefits. Cottage Grove has one of the highest indexes on need (17.1 out of 20.0) in the Economic Dislocation Index created for identifying communities impacted by the decline in the timber industry. On a positive note, Cottage Grove's high rating for Economic Dislocation enabled the town to receive over $1 million in state and federal grant money for economic recovery through the Timber Initiative.

As Cottage Grove seeks to diversify its local economy new commercial, recreational, and industrial sites are being developed. For over a decade, Cottage Grove has worked on the development of the North Regional Park as a recreational/commercial site. The City also developed a new industrial park containing a number of ready-to-build sites. This park is located at the south end of town along Highway 99. In recent years, there have been many inquiries for ready-to-build and ready-to-occupy industrial property, and the supply has not been able to meet the demand.

Each year, the city celebrates its history and traditions in several community events including Historic Home Tours, the Cottage Grove Rodeo, Bohemia Mining Days, and the Western Oregon Exposition.

Population
Cottage Grove is the largest of the non-metropolitan cities in the region, with an estimated 2004 population of 9,010.

Land Use
Residential uses occupy the largest share of development land within the urban growth boundary (UGB), comprising 26 percent of the total land area. Residential development, mostly single family and duplex development, has been occurring in the South 6th street region in the South section of Cottage Grove. Development has also been occurring in the Mount David area as well as on the West end of the city. Industrial development has begun in the Cottage Grove Industrial Park. Large public facility improvements, such as a new high school and new community hospital, have taken place in the last 2 years.

Percent	Land Use
26%	Residential
26%	Undeveloped
20%	Roads & Other
13%	Commercial
6%	Industrial
5%	Government, Education
4%	Parks

Housing
In 1998, there were 3,501 housing units in Cottage Grove, 76 percent of which were single-family, 19 percent multi-family units, and 5 percent manufactured homes in parks. The minimum lot size is 6,000 square feet and new housing is built on lots ranging from 6,000 to 9,000 square feet. The 1996 average assessed value of all single-family homes in Cottage Grove was $91,400.

Economy
In 1998, Cottage Grove's 313 employers provided a total of 3,200 jobs.

The largest employment sectors in Cottage Grove are retail trade and services. Education is the next largest sector followed by other professional services and timber-related industries. Examples of small local manufacturing companies that have sought limited industrial space in Cottage Grove include panelized housing, model-building kits, and handmade hardwood crafts.

Transportation
In 2004, approximately 40 percent of workers in Cottage Grove commuted to Eugene-Springfield, along Highway 99 and I-5.

Over the years, the city's streets have developed primarily in a grid pattern. More recently, the City has begun to develop a beltway arterial along the outer edges of the city to facilitate ease of movement.

Bicycle and pedestrian travel in Cottage Grove has been emphasized in local transportation planning for many years. A bike path system provides links to two regional parks within the city. The 17-mile Row River Trail *Rails-to-Trails* project is a popular recreational amenity for residents and visitors alike. This trail, a former short line railroad right-of-way, runs from downtown Cottage Grove, along Dorena Lake, to Culp Creek. These improvements have helped make the City more welcoming to pedestrians and bicyclists.

Public transit bus service is provided to commuters by Lane Transit District, as a result of a recent endeavor by local residents. A taxi service also provides local service in and around the city. The Central Oregon and Pacific Railroad offers daily freight service.

The Cottage Grove Airport, located on the northeast edge of the city, serves the Cottage Grove community. The State Aeronautics Division owns the airport.

Public Facilities and Services
Cottage Grove owns and operates its water supply system. Since the late 1970's, the City has planned major improvements to its water production and storage facilities to ensure a continued water supply for the future. Six years ago, that planning and preparation resulted in successful financing of water system improvements through a $2.8 million loan obtained from the Oregon Economic and Community Development Department Special Public Works Fund. An additional $100,000 of water system reserve funds

supplemented the loan money to complete the project as planned. Revenue collected from water users will repay the loan over a 20-year period. Construction was completed in September 1993, and continued improvements included covering the reservoir to improve water quality and developing extra capacity and new intake facilities at the water treatment plant.

The City owns and operates its own wastewater treatment system, which is currently being upgraded to accommodate growth and increase effluence quality. This system has numerous limitations and stormwater is contributing to inflow and infiltration problems.

Electricity is provided by Pacific Power and Emerald People's Utility District. Natural Gas is provided by Northwest Natural Gas. Qwest is the local telephone service provider. Cottage Grove is a member of the Fibersouth Consortium, a cooperative effort among local governments to provide modern fiber optic services to their communities. There are two fiber optic lines installed along the railroad tracks running through town: the main north-south West Coast fiber optic backbone and a new Fibersouth Consortium line. Both of these lines run just outside the Cottage Grove Industrial Park.

The South Lane School District provides education services to Cottage Grove students. The district operates six elementary schools, one middle school, and one high school. In addition the district provides alternative educational programs through the Alternative High School and the Blue Mountain School.

Cottage Grove maintains its own police force. The South Lane County Fire & Rescue provides fire protection, emergency medical response, and other specific rescue services for the City of Cottage Grove and surrounding rural areas.

Natural Resources, Open Space, and the Environment

Cottage Grove includes part of the floodplain of the Coast Fork that flows north to the Willamette River and is situated just above the confluence of the Coast Fork and Row Rivers. The surrounding hillsides and waterways contribute to the attractiveness of the area. Cottage Grove area residents and visitors can choose from a variety of water-oriented and urban parks, ranging from pocket parks to regional parks and the Willamette River Greenway. The hillside surrounding Cottage Grove provides an aesthetic environment for the community. The hillsides also present a specific set of development challenges and limitations. The complex system of slopes, soils, vegetation, and hydrology require sensitive, responsible development. In recognition of the importance of the hillsides to the city, Cottage Grove developed a major report on hillside development and included it as a specific focus of the *Cottage Grove Comprehensive Plan.*

Waterways are also significant features in Cottage Grove. Land in the city drains into the Coast Fork of the Willamette River, Row River, and Silk Creek. The section of the Coast Fork running through town is part of the Willamette River Greenway.

The most important wildlife habitat areas in and around Cottage Grove centers on the Coast Fork of the Willamette River, the Row River, and the backwater slough areas at the

confluence of these two rivers. There is significant fish spawning area in the Coast Fork, about one mile upstream of the UGB. The fishing of native cutthroat trout, steelhead, Chinook and Coho is a primary recreation activity.

Future Expectations

Land Use

The City of Cottage Grove Community Development Department enforces building and zoning codes to promote public safety and preserve the quality of life in Cottage Grove. The *Cottage Grove Comprehensive Plan's* development-related goals for future land use are:

- "To preserve our prime agricultural and forest lands considering their potential for both short and long term productivity.
- To encourage rural non-farm forest uses to locate on marginal lands where environmental and development constraints are limited.
- To protect our natural and cultural features from inappropriate and hazardous development
- To assure wise and efficient use of our urbanized lands."

The UGB contains a total of 2,814 acres, of which about 734 acres (26 percent) are undeveloped. The comprehensive plan designates 63 percent of Cottage Grove's UGB for residential use, and about 19 percent for commercial uses.

Economic Goals

The Cottage *Grove Comprehensive Plan's* economic goals are:

- "To encourage opportunities to broaden our economic base, but this should be a graduated transition that will not destroy our rich historical heritage and the natural amenities of the area.
- To take advantage of our location within commuting distance of the Eugene-Springfield area by providing for residential development and commercial services for those desiring metropolitan employment but a small town living environment.
- To continue to provide for tourist-oriented development.
- To strive to attract industrial development by assuring first that our community is a desirable place to work, life, shop, and play."

Cottage Grove faces some challenges over the next 50 years to stimulate its economy. The city's pleasant, attractive neighborhoods and well-established infrastructure give it a good foundation upon which to build.

Concerted efforts are underway to diversify and strengthen the economy in order to provide more opportunities for employment and to continue improving city services. The City recognizes a need for additional industrial land in order to diversify its industrial and manufacturing sector, a key to rebuilding and sustaining the local economy. Planned

improvements in the water and wastewater systems are integral to continued development and renewal of Cottage Grove's commercial and industrial sectors.

Cottage Grove has the potential to draw visitors from I-5, directing them to the downtown core, to the lakes, and around the community. The Downtown Association, the Cottage Grove Area Chamber of Commerce, the City of Cottage Grove, and other groups of citizens, have worked to make Cottage Grove more attractive to tourists, to draw more dollars to the community while keeping intact the City's small town charm.

As the economy rejuvenates, Cottage Grove's vision is to emerge as a vibrant, independent, leading community in the Southern Willamette Valley region.

Section 3: Hazard Assessment

Definition of a Hazard Assessment

Conducting a hazard assessment can provide information on the location of hazards, the value of existing land and property in hazard locations, and an analysis of risk to life, property, and the environment that may result from natural hazard events. Hazard assessments are subject to the availability of hazard-specific data. The three levels of a hazard assessment are as follows:

1) **Hazard Identification** identifies the geographic extent and intensity of the hazard, and the probability of its occurrence. Maps are frequently used to display the hazard identification data. The City of Cottage Grove identified six major hazards that threaten the area. These hazards are floods, landslides, wildfires, earthquakes, winter storms, and volcanoes.
2) **Vulnerability Assessment/Inventorying Assets** combines hazard identification with an inventory of the existing (or planned) property and population exposed to a hazard. A complete listing of the community assets exposed to each hazard is located in Table 3-2. Additionally, a more detailed description of the vulnerability of these assets is located in the specific hazard sections.
3) **Risk Analysis/Estimating Potential Losses** involves estimating the damage, injuries, and financial losses likely to be sustained in a geographic area over a given period of time. This level of analysis involves using mathematical models. The two major components of risk analysis are the magnitude of the harm that may result and the likelihood of the harm occurring. Describing vulnerability in terms of dollar losses provides the community and the state with a common framework in which to measure the effects of hazards on assets. Unfortunately, there is insufficient data and funding for conducting a risk analysis for the natural hazards affecting Cottage Grove. However, this need is identified in the action items and a complete risk assessment will be conducted when the resources are available.

Federal Requirements for a Hazard Assessment

Recent federal regulations for hazard mitigation plans outlined in 44 CFR Part 201.6 (c) (2) includes a requirement for hazard assessment. This hazard assessment requirement is intended to provide information that will help communities to identify and prioritize mitigation activities that will reduce losses from the identified hazards. Table 3-1, below, shows the federal criteria for hazard assessment and how the City of Cottage Grove Natural Hazard Mitigation Plan meets those criteria.

Table 3-1 Federal Criteria for Hazard Assessment

Section 322 requirement	*How is this addressed?*
Identifying Hazards	The City of Cottage has mapped the hazard areas for wildfire, flood, landslide, and earthquake. (See individual hazard sections for more information)
Profiling Hazard Events	The hazard sections of the Cottage Grove Natural Hazard Mitigation Plan provide documentation for all of the historic large-scale hazard events affecting the city. Annex C is a chronology of natural hazard incidents in Cottage Grove's history.
Assessing Vulnerability: Identifying Assets	Table 3-2 documents the community assets and critical infrastructure that are vulnerable to natural hazards.
Assessing Vulnerability: Estimating Potential Losses	Using the best available data, an estimate of potential losses from natural hazards in located in the hazard specific sections.
Assessing Vulnerability: Analyzing Development Trends	The Community Profile section of this plan provides a description of the development trends in the City of Cottage Grove

Hazard Assessment Mapping Methodology

The City of Cottage Grove received a Homeland Security Grant from the Federal Emergency Management Agency and contracted with the Lane Council of Governments (LCOG) to develop maps for the City of Cottage Grove Emergency Operations Plan. These maps are able to meet the requirements of both plans by mapping the hazard areas associated with natural disasters. In developing the maps local knowledge as well as information developed by LCOG and other government agencies were used to create the most accurate maps using the best available data. Maps addressing specific hazards are located at the end of the plan.

Community Assets: Vulnerability Assessment

This section outlines the resources, facilities and infrastructure that, if damaged, could significantly impact public safety, economic conditions, and environmental integrity of the City of Cottage Grove. The exposure of community assets to natural hazards is provided in Table 3-3. Below Table 3-2 outlines the types of critical facilities and infrastructure within the City of Cottage Grove.

Table 3-2: Critical Facilities & Infrastructure

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

- City Hall (Emergency Operations Center (EOC) #1, Police Station, 911 Call Center, Jail)

- Community Center (EOC #2)
- Fire Station (EOC #3)
- City of Cottage Grove Public Works Shop
- Water Treatment Facilities (Layng Creek, Row River, Reservoirs)
- Wastewater Treatment Plant

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

- Cottage Grove High School-Red Cross Shelter
- Our Lady of Perpetual Help Catholic Church-Red Cross Shelter
- Cottage Grove Community Hospital
- Prime Med
- South Lane School District Transportation Center

Critical Infrastructure: Infrastructure that provides services for the City of Cottage Grove.

- Telephone Lines
- Gas Lines
- Power Lines
- Transportation Networks
- Bridges
- Railroad
- Water Treatment, Storage, and Distribution Lines
- Wastewater Collection
- Cell Phone Towers

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

- Cottage Grove Community Hospital
- Coast Fork Nursing Home
- Riverview Terrace
- Magnolia Gardens
- South Lane School District Schools
- Coast Fork Learning Center

Economic Assets/Population Centers: Economic Centers, are those businesses that employ large numbers of people, and provide an economic resource to the City of Cottage Grove. *Population Centers* usually are aligned with economic centers, and will be if particular concern for evacuation/notification during a hazard event.

- South Lane School District
- Cottage Grove Industrial Park
- Cottage Grove Community Hospital
- Safeway
- Walmart
- Qwikee Products

- Starfire Lumber
- Weyerhaeuser

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

- North Regional Park
- East Regional Park
- Willamette River Greenway
- Silk Creek
- Pine Grove Wetlands
- Industrial Park Wetlands
- Speedway Wetlands
- Bohemia School Wetlands
- High School Wetlands
- Mt. David
- Row River
- Coast Fork of the Willamette River
- Cottage Grove Lake
- Dorena Lake
- Willamette National Forrest

Hazardous Materials: Those sites that store, manufacture, or use potentially hazardous materials.

- Welt & Welt
- Kimwood Corp
- City of Cottage Grove

Hazard	% Land Area	History	Vulnerab. Pop.	Maximum Threat	Prob.	Critical Facilities/ Infrastructure	Econ & Pop Centers	Essential Facilities	Environmental Assets	Haz-Mat Sites
Flood	5%	HIGH (8)	HIGH (7)	MEDIUM (6)	HIGH (9)	City Hall Wastewater Row River Water Bridges	-	-	N. Rgnl P. E. Rgnl. P. Greenway Pine Grove W. Speedway W. Row River Willamette R.	City
Landslide	<1%	LOW (2)	LOW (2)	MEDIUM (4)	LOW (3)	-	-	-	Mt. David	-
Earthquake	100%	LOW (3)	HIGH (8)	HIGH (10)	LOW (3)	Row River Water Public Works City Hall Fire Station #1 Gas/Phone/Water/ Power lines Bridges	Lincoln MS CGHS Safeway Qwikee	Hospital PrimeMed Catholic Church	N. Rgnl. P E. Rgnl. P Greenway Mt. David Row River	Welt & Welt City
Winter Storm	100%	HIGH (8)	HIGH (8)	MEDIUM (5)	HIGH (9)	Overhead Lines	-	-	-	-
Wildfire	20%	LOW (3)	MEDIUM (4)	LOW (3)	MEDIUM (5)	Knox Butte Res. Wastewater	Bohemia CGHS	CGHS	Mt. David	-
Volcano	<1%	LOW (1)	MEDIUM (4)	LOW (2)	LOW (1)	-	-	-	-	-

Table 3-3: City of Cottage Grove Vulnerability Analysis

Section 4: Natural Hazards

Flooding

Flooding Profile

The City of Cottage Grove is located to the south of the confluence of the Row River and the Coast Fork of the Willamette River. These two rivers as well as Silk Creek contribute to the flooding hazard in Cottage Grove. Cottage Grove has a long history of flood events. The most heavily flooded areas are the low lands along the Row and Willamette Rivers. Since the construction of Cottage Grove and Dorena Dams in the 1940s, flooding has been less severe.

This historical recount of flooding was developed from the Cottage Grove Development Timeline created by community members using data from local historical resources, such as the Cottage Grove Museum. The complete timeline is attached as annex C to the end of the Plan.

- "1861 Floods hit the area.
- 1881 Floods in the town
- 1926 People rode rowboats into the Bartell Hotel
- 1933 Flood in the town
- 1946 January heavy rains...4.32 inches-Floods
- 1961 February Floods-4.74 inches in 24 hours
- 1963 High water at Christmas
- 1964 High water again
- 1985 Flooding in the area with heavy rains
- 1996 100 inches of rain, flooding"

Using analysis of aerial photographs and comparing them with the floodway and 100-year flood zone maps to identify structures located in flood hazard areas. There were 25 structures identified in the floodway and 137 structures identified in the 100-year flood zone.

Flooding Hazard Assessment

Hazard Identification

FEMA has produced Flood Insurance Rate Maps (FIRM) for Cottage Grove which detail the flood hazard areas, these 100-year flood plane and floodway maps have been digitized and reproduced for the City of Cottage Grove by LCOG and are attached to the plan in annex A. The Lane County Multi-Hazard Mitigation Plan addresses the risk of flooding in Lane County, in section 6, and the same assessment applies to Cottage Grove and will not be repeated here.

A failure of either the Cottage Grove or Dorena dam would cause significant flooding in the area, far beyond the capacity of a naturally occurring flood event.

Vulnerability Assessment

Community assets located in the 100-year flood plane include the Row River Water Treatment Facility, the Wastewater Treatment Facility, City Hall, Bridges, North Regional Park, East Regional Park, Willamette River Greenway, Pine Grove Wetlands, Speedway Wetlands, Coast Fork of the Willamette River, Row River, and Silk Creek.

The critical facilities that face flood hazards in the 100-year flood plane are major facilities that if incapacitated would cause tremendous problems for the City as well as citizens. Bridges are also vulnerable to flooding because debris can choke bridges and cause them to collapse under the increased pressure. The City of Cottage Grove relies on bridges for transportation, as the Coast Fork of the Willamette River divides the city with all critical facilities located on the East portion of the city. A collapse of all bridges would leave the West portion of the city isolated from emergency services.

Potential 100-year flood events affect less than 5 percent of the property within the City of Cottage Grove. A 500-year flood event would impact approximately one third of the land located within city limits.

Risk Analysis

Due to insufficient data and funding, the city of Cottage Grove is unable to perform a quantitative risk analysis at this time. The City has addressed this issue in the action items, and will be completing a risk assessment as data and resources become available.

Repetitive Flood Loss

The City of Cottage Grove works to mitigate problems regarding flood issues when they arise. Throughout history, some areas in the city are more susceptible to flooding issues and may have incurred repetitive losses, meaning they have more than two National Flood Insurance Program (NFIP) claims in a ten-year period. There have been 10 claims to NFIP in Cottage Grove since it's inception in 1978. Of those claims only 3 were closed for a total of $5,068.63 in payouts. According to the most current data from Oregon Emergency Management, there are no properties in Cottage Grove that meet the criteria for repetitive loss at this time.

Existing Flood Mitigation Activities

Flood mitigation activities listed here include current mitigation programs and activities that are being implemented by the City of Cottage Grove or other agencies or organizations.

Incorporated Municipality Codes Pertaining to Flooding

The City of Cottage Grove addresses flood hazards in Chapter 18.39, Flood Plain Management, of the Cottage Grove Zoning Code. Section 18.39.070, Methods of reducing flood losses, states: In order to accomplish its purpose, this chapter includes methods and provisions for:

A. Restricting or prohibiting uses which are dangerous to health, safety and property due to water or erosion hazards, or which result in damaging increases in erosion or in flood heights or velocities;

B. Requiring that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;

C. Controlling the alterations of natural flood plains, stream channels and natural protective barriers, which help accommodate or channel flood waters;

D. Controlling filling, grading, dredging and other development which may increase flood damage; and,

E. Preventing or regulating the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards in other areas.

Flood Mitigation Projects

The City of Cottage Grove has identified areas that may be susceptible to flood hazards, but no mitigation projects have been completed at this time.

Flood Mitigation Action Items

The flood mitigation action items provide direction on specific activities that organizations and residents in Cottage Grove can undertake to reduce risk and prevent loss from flood events. Each action item is followed by ideas for implementation, which can be used by local decision makers in pursuing strategies for implementation.

ST-Flood #1: Investigate FEMA's Community Rating System requirements to potentially lower flood insurance rates.

Ideas for Implementation

- Attend FEMA Community Rating System training.

Coordinating Organization: Community Development

Timeline: 1-2 years

Plan Goals Addressed: Protect Life and Property, Public Awareness, Partnerships and Implementation

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LT-Flood #2: Improve upon localalized flood hazard knowledge.

Ideas for Implementation

- Map areas of known flooding outside 100-year floodplain.
- Survey elevation data for structures within the 100-year floodplain to quantify the level of risk for each structure.
- For structures with high flooding risk which have experienced repetitive loss explore mitigation alternatives.

Coordinating Organization: Community Development
Timeline: Ongoing
Plan Goals Addressed: Protect Life and Property, Public Awareness, Emergency Services, Partnerships and Implementation

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ST-Flood #3: Inventory structures and infrastructure in the FEMA mapped floodway and explore mitigation options.

Ideas for Implementation

- Restrict new development in high hazard areas.

Coordinating Organization: Community Development
Timeline: 1-2 years
Plan Goals Addressed: Protect Life and Property, Public Awareness, Partnerships and Implementation

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LT –Flood #4: Address concerns associated with development in areas with high water tables.

Ideas for Implementation

- Survey for high water tables.
- Explore regulatory options for structures and infrastructure in high water table areas.
- Explore water table testing regulations for new development in areas near or inside the 100-year floodplain.

Coordinating Organization: Community Development
Timeline: 3-5 years
Plan Goals Addressed: Protect Life and Property, Public Awareness, Partnerships and Implementation

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LT-Flood #5: Increase channel maintenance and debris removal from rivers and streams.

Ideas for Implementation

- Coordinate with the Army Corp of Engineers and the Oregon Department of Fish & Wildlife.

Coordinating Organization: Community Development
Timeline: Ongoing
Plan Goals Addressed: Protect Life and Property, Public Awareness, Emergency Services, Partnerships and Implementation

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ST-Flood #6: Update Storm Drainage Master Plan, determine and implement appropriate mitigation measures.

Coordinating Organization: Public Works
Timeline: 1-2 years
Plan Goals Addressed: Protect Life and Property, Public Awareness, Emergency Services, Partnerships and Implementation

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ST-Flood #7: Improve public notification system in case of a dam break.

Ideas for Implementation

- Coordinate with the Army Corp of Engineers to develop a warning procedure.

Coordinating Organization: Community Development
Timeline: 1-2 years
Plan Goals Addressed: Protect Life and Property, Public Awareness, Emergency Services, Partnerships and Implementation

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Landslide

Landslide Profile

The probability of landslide events in the City of Cottage Grove was determined using scientific data, historical occurrences, and local knowledge and has been mapped by LCOG, the map: *Natural Hazards in the City of Cottage Grove* is attached to this plan in annex A. The Lane County Multi-Hazard Mitigation Plan addresses the risk of landslide in Lane County, in section 8, and the same assessment applies to Cottage Grove and will not be repeated here.

This historical account of landslides was developed from the Cottage Grove Development Timeline created by community members using data from local historical resources, such as the Cottage Grove Museum. The complete timeline is attached as annex C to the end of the Plan. The timeline suggests that no major landslide events have occurred within the City of Cottage Grove in recent history.

Landslide Hazard Assessment

Hazard Identification

Landslide hazards within the City of Cottage Grove are concentrated in the Mt. David area, especially portions of the North, South, and East sides of Mt. David along Holly Avenue and Kalapuya Way. Construction has already occurred on the lower potions of Holly Avenue and portions of Kalapuya Way. Other debris-flow hazards located within the City of Cottage Grove are above and east of the 22nd street neighborhood.

Vulnerability Assessment

Though less than one percent of the land area is subject to landslide hazards there are some areas in which landslides do pose a hazard to built property. Using analysis of aerial photographs and comparing them with the debris flow hazard maps to identify structures located in debris-flow hazard areas. There were 31 structures identified in the debris-flow hazard areas. These properties do not include any commercial or industrial developments.

Risk Analysis

Due to insufficient data, the City of Cottage Grove is unable to perform a quantitative risk assessment at this time. The City has addressed this in the action items, and will be completing a risk assessment as data and resources become available.

Existing Landslide Mitigation Activities

Landslide mitigation activities listed here include current mitigation programs and activities that are being implemented by the City of Cottage Grove or other agencies or organizations.

Incorporated Municipality Codes Pertaining to Landslides

The City of Cottage Grove Comprehensive Plan addresses hillside development but at this time there is no zoning code that addresses development in landslide hazard areas. In 1977 a report was completed entitled, *The City and Its Hillsides: A Report Concerning Future Hillside Development*. This report and *The Comprehensive Plan* address the need for a hillside development ordinance. The development of this code is addressed as landslide action item ST-Landslide #2.

Landslide Mitigation Projects

The City of Cottage Grove has identified steep slopes that may be susceptible to landslide hazards, but no mitigation projects have been completed at this time.

Landslide Mitigation Action Items

The landslide mitigation action items provide direction on specific activities that organizations and residents in Cottage Grove can undertake to reduce risk and prevent loss from landslide events. Each action item is followed by ideas for implementation, which can be used by local decision makers in pursuing strategies for implementation.

LT -Landslide #1: Evaluate risk level for buildings identified in the landslide hazard area.

Coordinating Organization: Community Development
Timeline: 3-5 years
Plan Goals Addressed: Protect Life and Property, Public Awareness, Partnerships and Implementation

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ST-Landslide #2: Limit future development in high landslide potential areas.

Ideas for Implementation

- Write and adopt a hillside ordinance.

Coordinating Organization: Community Development
Timeline: 1-2 years
Plan Goals Addressed: Protect Life and Property, Public Awareness, Emergency Services, Partnerships and Implementation

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ST-Landslide #3: Adopt erosion control regulations for all development, especially in high landslide hazard areas.

Coordinating Organization: Community Development
Timeline: 1-2 years
Plan Goals Addressed: Protect Life and Property, Public Awareness, Emergency Services, Partnerships and Implementation

Wildfire

Wildfire Profile

The probability of wildfire events in Cottage Grove was determined using scientific data, historical occurrences, and local knowledge and has been mapped by LCOG. The map, *Wildland-Urban Interface in Cottage Grove*, is attached to this plan in annex A. The Lane County Multi-Hazard Mitigation Plan addresses the risk of wildfire in Lane County, in section 9, and the same assessment applies to Cottage Grove and will not be repeated here.

This historical account of wildfire was developed from the Cottage Grove Development Timeline created by community members using data from local historical resources, such as the Cottage Grove Museum. The complete timeline is attached as annex C to the end of the Plan. The timeline suggests that no major wildfire events have occurred within the City of Cottage Grove in recent history.

Wildfire Hazard Assessment

Hazard Identification

Wildfire hazards within the City of Cottage Grove occur mostly in the outlying areas of the city. In the north section of the city a Wildland-Urban interface area occurs in North Regional Park and Mt. David. To the west along the UGB and including the Grove of Pines development as well as areas behind Bohemia Elementary School and Cottage Grove High School. To the south properties along the Willamette River Greenway may be vulnerable to wildland-urban interface fires. Fortunately these are sparsely populated areas. To the east along Knox Butte there is also substantial wildland-urban interface potential.

Vulnerability Assessment

Community assets located in the wildland-urban interface hazard area include the Wastewater Treatment Facility, Bohemia School, Cottage Grove High School, South Lane County Fire & Rescue, and Knox Butte Reservoir.

The critical facilities that face wildland-urban interface hazard potential are major facilities that if incapacitated would cause tremendous problems for the City and citizens. Only one densely populated area, the Grove of Pines subdivision, within the UGB is in the wildland-urban interface hazard area.

Although only 10 percent of the land in Cottage Grove is located in the wildland-urban interface and there is no history of large wildland fire in the Cottage Grove area the potential damage caused by such a fire is great.

Risk Analysis

Due to insufficient data, Cottage Grove is unable to perform a quantitative risk assessment at this time. The City has addressed this issue in the action items, and it will be completing a risk assessment as data and resources become available.

Existing Wildfire Mitigation Activities

The South Lane County Fire & Rescue district covers 150 square miles with a population of 25,000. The district is comprised of an urban and rural mix of residential properties, light industry, commercial, and forestland. The fire district provides information and public outreach during the year to promote fire safety awareness.

Incorporated Municipality Codes Pertaining to Wildfires

Cottage Grove Municipal code 8.12.040, Noxious Vegetation, states:

No person shall allow, cause, permit or suffer noxious vegetation on property or in the right of way of a street, alley or sidewalk abutting the property. Noxious vegetation must be cut down or destroyed as often as needed to prevent the creation of a health, fire or traffic hazard, or in the case of weeds or other noxious vegetation, from maturing or from going to seed. Noxious vegetation includes:

A. Vegetation that is or is likely to become:
   a. A health hazard;
   b. A fire hazard;
   c. A traffic hazard, because it impairs the view of a public right of way or otherwise makes the use of the thoroughfare hazardous; or
   d. Grass or weeds exceeding 12 inches. Properties used for crop cultivation and livestock grazing are exempt from the tall grass and weeds provision if a five foot wide cut or cleared fire break surrounds the perimeter of the property.

B. Poison Oak.

C. Poison Ivy.

D. Blackberry bushes that extend into a public way or a pathway frequently by children, or cross a property line.

Local Fire Prevention/Education Programs

South Lane County Fire & Rescue Department offers the following fire prevention/education services for its residents.

- Smokey The Bear
- 1st Grade Fire Awareness
- Business Fire Inspections
- Educational Classes upon Request
- Fire Prevention Week
- Community Emergency Response Team (CERT) training

Wildfire Mitigation Action Items

The wildfire mitigation action item provides direction on specific activities that organizations and residents in Cottage Grove can undertake to reduce risk and prevent loss from wildfire events. The action item is followed by ideas for implementation, which can be used by local decision makers in pursuing strategies for implementation.

LT-Wildland Fire #1: Encourage fire-safe construction practices for existing and new construction in high-risk areas.

Ideas for Implementation

- Explore FireWise construction and development practices for new development.

Coordinating Organization: Community Development & South Lane County Fire & Rescue

Timeline: Ongoing

Plan Goals Addressed: Protect Life and Property, Public Awareness, Emergency Services, Partnerships and Implementation

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Winter Storm

Winter Storm Profile

The probability of winter storm events in Cottage Gove was determined by using scientific data, historical occurrences, and local knowledge. The Lane County Multi-Hazard Mitigation Plan addresses the risk of winter storms in Lane County, in section 7, and the same assessment applies to Cottage Grove and will not be repeated here.

This historical account of winter storms was developed from the Cottage Grove Development Timeline created by community members using data from local historical resources, such as the Cottage Grove Museum. The complete timeline is attached as annex C to the end of the Plan.

- "1884 Year of the BIG snow, three feet in December
- 1887 Cyclone hits Cottage Grove
- 1919 The deep snows
- 1931 Huge windstorm in May-55 trees topple on Brice Creek Road
- 1949 Cottage Grove Lake freezes over
- 1962 Hurricane Frieda (Columbus Day Storm) in October. 100 mph winds.
- 1984 Heavy snows and lots of freezing
- 1988 Snow heavy
- 2002 Wind storm knocks trees down"
- 2003/2004 freezing rain, ice, and snow

Winter Storm Hazard Assessment

Hazard Identification

Severe winter storm hazards are located where trees and vegetation align with utility and power lines as well as near roads and houses. Winter storm hazards are located throughout the city. The majority of winter storms result in power outages, blocked streets, and property damage from fallen trees.

Vulnerability Assessment

Severe storms can be life threatening, cause major infrastructure damage, and can be difficult to manage in terms of response and recovery. Winter storms can cover the road networks with snow and ice, impeding transportation to schools and medical facilities. Winter storms and windstorms can topple trees, down power lines, and causes widespread power outages. Local utilities and Public Works could be strained during a severe storm event as they work to clear roads and repair or replace power distribution and/or transmission lines, and maintain telephone lines for communication. Older residential areas such as the northwest neighborhood, 1-3rd street neighborhood, and n. 10th street neighborhoods, are more susceptible to winter storm hazards due to overhead power lines and large trees.

Risk Analysis
Due to insufficient data, Cottage Grove is unable to perform a quantitative risk assessment at this time. The City has addressed this issue in the action items, and will be completing a risk assessment as data and resources become available.

Existing Winter Storm Mitigation Activities
Local utilities work to identify areas for tree trimming that can cause power line outages, and put life and property at risk.

Incorporated Municipality Codes Pertaining to Winter Storms
Cottage Grove City Council Resolution No. 685 states:

(7) UNDERGROUND UTILITIES

Underground power and telephone cables shall be required in all new subdivisions and will be provided by the developer.

Except where impractical, underground service will be required on all new construction throughout the city.

Winter Storm Mitigation Action Items
The winter storm mitigation action items provide direction on specific activities that organizations and residents in Cottage Grove can undertake to reduce risk and prevent loss from winter storm events. Each action item is followed by ideas for implementation, which can be used by local decision makers in pursuing strategies for implementation.

LT-Winter Storm #1: Decrease risk of power and utility outages by moving lines underground.

Ideas for Implementation

- Develop private/public partnerships to bury power lines in the downtown corp.
- Continue to require all new construction, including remodels, to include underground power lines.

Coordinating Organization: Community Development
Timeline: Ongoing
Plan Goals Addressed: Protect Life and Property, Public Awareness, Emergency Services, Partnerships and Implementation

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LT-Winter Storm #2: Periodically survey trees on city property and trim as necessary.

Coordinating Organization: Public Works
Timeline: Ongoing
Plan Goals Addressed: Protect Life and Property, Public Awareness, Emergency Services, Partnerships and Implementation

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LT-Winter Storm #3: Ensure that critical facilities have backup power and emergency operations plans to deal with power outages.

Ideas for Implementation

- Continue communication with local agencies involved in disaster relief.
- Periodically review City emergency plans.

Coordinating Organization: Community Development
Timeline: Ongoing
Plan Goals Addressed: Protect Life and Property, Public Awareness, Emergency Services, Partnerships and Implementation

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Earthquake

Earthquake Profile

The probability of earthquake events in Cottage Grove was determined using scientific data, historical occurrences, and local knowledge and has been mapped by LCOG. The map, *Relative Earthquake Hazard Zones in Cottage Grove*, is attached to this plan in annex A. The Lane County Multi-Hazard Mitigation Plan addresses the risk of earthquakes in Lane County, in section 10, and the same assessment applies to Cottage Grove and will not be repeated here.

This historical recount of earthquakes was developed from the Cottage Grove Development Timeline created by community members using data from local historical resources, such as the Cottage Grove Museum. The complete timeline is attached as annex C to the end of the Plan.

- "1993 March 13-Earthquake felt from Seattle to Roseburg"

Earthquake Hazard Assessment

Hazard Identification

LCOG created relative earthquake hazard maps for Cottage Grove using information from the Department of Geology and Mineral Industries. There are two distinct lines of low to intermediate hazard running through the city. These lines diverge near the I-5 Row River intersection. The west branch of the hazard area runs through the north 10th street area and continuing down Highway 99. The East branch follows closely along Row River. The only intermediate to high hazard area is located along Holly Avenue where the Hidden Valley Development exists on the border of Hidden Valley Golf Course.

Vulnerability Assessment

Community assets located in the low to intermediate earthquake hazard area include the Row River Water Treatment Facility, Lincoln Middle School, Fire Station 1, City Hall, and Public Works Shops. Many other buildings due to lack of seismic retrofitting are at risk during an earthquake event. All of downtown is susceptible during an earthquake. Many of the buildings downtown are at specific risk due to the type of construction. Liquefaction in the downtown core is a possibility but the probability is relatively small. There are no critical facilities located in the intermediate to high hazard areas.

An earthquake event could cause substantial damage to area bridges and infrastructure. In the case of bridge failure the west side of the city could potentially be cut off from all emergency services. The water transmission line from Layng Creek is at risk during an earthquake event. This line supplies much of the city's drinking water and a break in the line would cause a significant problem for Public Works to deal with.

Risk Analysis

Due to insufficient data, Cottage Grove is unable to perform a quantitative risk assessment at this time. The City has addressed this issue in the action items, and will be completing a risk assessment as data and resources become available.

Existing Earthquake Mitigation Activities

The City of Cottage Grove has adopted the International Building Code, which sets the minimum design and construction standards for new buildings.

The South Lane School District has developed seismic preparation procedures and routinely conducts drills. These drills include familiarization with routes and methods of exiting the building and methods of duck, cover and hold during an earthquake.

Earthquake Mitigation Action Items

The earthquake mitigation action items provide direction on specific activities that organizations and residents in Cottage Grove can undertake to reduce risk and prevent loss from earthquake events. The action items are followed by ideas for implementation, which can be used by local decision makers in pursuing strategies for implementation.

LT-Earthquake #1: Complete inventory of residential, commercial, and public buildings in Cottage Grove that may be particularly vulnerable to earthquake damage, including (but not limited to) unreinforced masonry buildings and wood frame buildings with cripple wall foundations and with sill plates not bolted to the foundation.

Coordinating Organization: Community Development
Timeline: 3-5 years
Plan Goals Addressed: Protect Life and Property, Public Awareness, Partnerships and Implementation

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LT-Earthquake #2: Complete seismic vulnerability assessments and develop mitigation strategies of seismic retrofit of critical public buildings identified as being particularly vulnerable.

Ideas for Implementation

- Educate and encourage residents and businesses in vulnerable buildings to undertake retrofits.

Coordinating Organization: Community Development
Timeline: 3-5 years
Plan Goals Addressed: Protect Life and Property, Public Awareness, Emergency Services, Partnerships and Implementation

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ST-Earthquake #3: Study and make necessary improvements to the water transmission line from Layng Creek.

Ideas for Implementation

- Conduct a cost benefit analysis of the possible improvement project.

Coordinating Organization: Community Development

Timeline: 1-2 years

Plan Goals Addressed: Protect Life and Property, Public Awareness, Emergency Services, Partnerships and Implementation

Volcanic Eruption

Volcano Profile

The probability of volcanic eruptions in Cottage Grove was determined using scientific data, historical occurrences, and local knowledge. The Lane County Multi-Hazard Mitigation Plan addresses the risk of volcanic eruption in Lane County, in section 11, and the same assessment applies to Cottage Grove and will not be repeated here.

This historical recount of volcanic eruptions was developed from the Cottage Grove Development Timeline created by community members using data from local historical resources, such as the Cottage Grove Museum. The complete timeline is attached as annex C to the end of the Plan.

- "1980 Mt. St. Helens erupts"

Volcanic Eruption Hazard Assessment

There is very little risk for the City of Cottage Grove concerning volcanic eruption. The closest active volcanoes, the Three Sisters Range, pose little threat of ash fall to Cottage Grove due to the direction of the prevailing wind moving ash away from Cottage Grove. If ash fall were to become significant in the Cottage Grove area it could pose a risk to all critical facilities as well as transportation routes.

Existing Volcanic Eruption Mitigation Activities

There are currently no existing volcanic eruption mitigation activities occurring within Cottage Grove.

Volcanic Eruption Mitigation Action Items

The City of Cottage Grove will not be undertaking any local volcanic eruption mitigation activities at this time.

Multi-Hazard

Multi-Hazard Action Items

Multi-hazard action items are those activities that pertain to many or all six hazards in the mitigation plan: flood, landslide, wildfire, winter storm, earthquake, and volcanic eruption.

LT-Multi-Hazard #1: Complete inventories of buildings and infrastructure at risk from each hazard and prioritize mitigation projects to reduce the level of risk.

Ideas for Implementation

- Perform a quantitative risk analysis for each hazard.

Coordinating Organization: Community Development
Timeline: 3-5 years
Plan Goals Addressed: Protection of Life and Property, Public Awareness, Emergency Services

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LT–Multi-Hazard #2: Identify and pursue funding opportunities to develop and implement specific mitigation projects in Cottage Grove.

Ideas for Implementation

- FEMA pre-disaster and post-disaster mitigation programs.
- Other Federal government programs.
- State, Lane County and other resources.

Coordinating Organization: Community Development
Timeline: Ongoing
Plan Goals Addressed: Protection of Life and Property, Public Awareness, Emergency Services, Partnerships and Implementation

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ST-Multi-Hazard #3: Strengthen emergency preparedness and response capabilities.

Ideas for Implementation

- Conduct regional and local emergency exercises.
- Pursue local, state, and federal funding for multi-agency exercises.

Coordinating Organization: Community Development
Timeline: 1-2 years
Plan Goals Addressed: Protection of Life and Property, Public Awareness, Emergency Services, Partnerships and Implementation

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ST-Multi-Hazard #4: Integrate the information, objectives, mitigation strategies and action items into existing regulatory documents and programs.

Ideas for Implementation

- Coordinate the mitigation strategies and action items with capital improvement programs and budget planning.
- Coordinate the mitigation strategies and action items with zoning, land use, and development strategies.

Coordinating Organization: Community Development
Timeline: 1-2 Years
Plan Goals Addressed: Protection of Life and Property, Emergency Services, Partnerships and Implementation

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ST-Multi-Hazard #5: Update the Comprehensive Plan to meet State Land Use Planning Goal 7.

Ideas for Implementation

- Adopt a hazard overlay zone.

Coordinating Organization: Community Development
Timeline: 1-2 years
Plan Goals Addressed: Protection of Life and Property, Emergency Services, Partnerships and Implementation

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LT-Multi-Hazard #6: Enhance awareness of natural hazards.

Ideas for Implementation

- Encourage public/private partnerships for mitigation actions.
- Create an outreach and education program.

Coordinating Organization: Community Development
Timeline: Ongoing
Plan Goals Addressed: Protection of Life and Property, Public Awareness, Emergency Services, Partnerships and Implementation

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LT-Multi-Hazard #7: Increase the medical resources capable of handling large-scale medical needs.

Ideas for Implementation

- Develop community outreach and education programs regarding first aid and CERT teams.
- Continue to train and retain school and City staff members in first aid.
- Attain funding for emergency management supplies.
- Coordinate with medical clinics in Cottage Grove
- Identify facilities that have cold storage capabilities.

Coordinating Organization: Community Development
Timeline: Ongoing
Plan Goals Addressed: Protect Life and Property, Public Awareness, Emergency Services, Partnerships and Implementation

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ST-Multi-Hazard #8: Ensure that there are adequate shelter facilities in hazard-free zones to serve Cottage Grove residents.

Ideas for Implementation

- Identify and contact Non-Red Cross potential shelter locations to ensure that they are prepared for disaster scenarios.
- Identify resource needs at shelter sites and attain funding to equip emergency shelters.
- Contact Red Cross shelter sites to renew and maintain agreements annually.

Coordinating Organization: Community Development/Library
Timeline: Ongoing
Plan Goals Addressed: Protect Life and Property, Public Awareness, Emergency Services, Partnerships and Implementation

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Section 5: Mitigation Planning Priority System

Action Item Prioritization Methodology

The City of Cottage Grove has prioritized the identified mitigation strategies in order to better allocate resources for plan implementation. The criteria used for prioritizing the action items are the plan goals, hazards addressed, criticality of need, population served, and likelihood of success.

Although this methodology provides a guide in terms of implementation, the City has the option to implement any of the action items at any time. This option to consider all action items for implementation allows the City to consider mitigation strategies as new situations arise, such as capitalizing on funding sources that could pertain to an action item that is not the highest priority.

Step 1: Prioritize Plan Goals

The Cottage Grove mitigation goals including Protect Life and Property, Public Awareness, Emergency Services, and Partnerships and Implementation were considered during each phase of the mitigation planning process. As the mitigation action items were developed, the City identified which plan goals were addressed by each action item. The City ranked the plan goals to determine the priorities for Cottage Grove, and each goal was given a score of two points to five points, in ascending order. The points for the plan goals were then totaled for each action item. The prioritized plan goals are as follows:

5 Points: Protect Life and Property
4 Points: Emergency Services
3 Points: Public Awareness
2 Point: Partnership and Implementation

Step 2: Prioritize Hazards

The natural hazards addressed by the Cottage Grove Natural Hazards Mitigation Plan were prioritized using the FEMA-accepted hazard analysis methodology for Emergency Operations Plans. This methodology considers the history of the hazard, the vulnerability to the hazard, the maximum threat of the hazard (worse case scenario), and the probability of the hazard. Each of these criteria was weighted, and the final score was used for prioritizing the hazards. The following is a full description of the methodology used:

Categories Considered:

Severity Rating Scores

LOW	1-3 points
MEDIUM	4-6 points
HIGH	7-10 points

History: The record of occurrences of previous major emergencies or disasters (weight factor=2).

LOW	0-1 event per 100 years
MEDIUM	2-3 events per 100 years
HIGH	4+ events per 100 years

Vulnerability: The percentage of population and property likely to be affected (weight factor=5).

LOW	<1% affected
MEDIUM	1-10% affected
HIGH	>10% affected

Maximum Threat: The maximum percentage of population and property that could be impacted under a worst-case scenario (weight factor=10).

LOW	<5% affected
MEDIUM	5-25% affected
HIGH	>25% affected

Probability: The likelihood of occurrence within a specified period of time (weight factor=7).

LOW	>1 chance per 100 years
MEDIUM	>1 chance per 50 years
HIGH	>1 chance per 10 years

Although the methodology used allows the City of Cottage Grove to quantify and compare natural hazards, it is flawed in that it compares hazards with high probabilities and relatively low consequences with hazards that have low probabilities and high consequences. The City of Cottage Grove took this into consideration during the prioritization process, and the results are shown in table 5-1. The hazards were given a score of one point to seven points, in ascending order of importance. The Multi-Hazard action items were given the highest score (7), as they address more than one hazard. The points for the hazard scores were then totaled for each action item.

Economic Analysis

At this time the City of Cottage Grove cannot perform cost-benefit analysis on all potential mitigation action-items. When funding becomes available the City will perform an economic analysis on the action-items at that time. Before any mitigation action-item is undertaken the City will perform an economic analysis on the project, the economic analysis will be performed according to the guidelines outlined in Annex E, 'Economic Analysis of Natural Hazard Mitigation Projects.' That economic analysis can be either cost-benefit analysis or cost-effective analysis. If the benefits outweigh the costs the City can undertake the project. The action-items below in table 5-2 have been separated into those which can be performed with existing resources and those in which additional funding must be secured in order to complete.

Table 5-1 Natural Hazard Prioritization Score

Hazard	History	Vulnerable Population	Maximum Threat	Probability	Total	Hazard Score
Multi-Hazard	–	–	–	–	–	7
Flood	16	35	60	63	174	6
Winter Storm	16	40	50	63	169	5
Earthquake	6	40	100	21	167	4
Wildfire	6	20	30	35	90	3
Landslide	4	10	40	21	75	2
Volcano	2	20	20	7	49	1

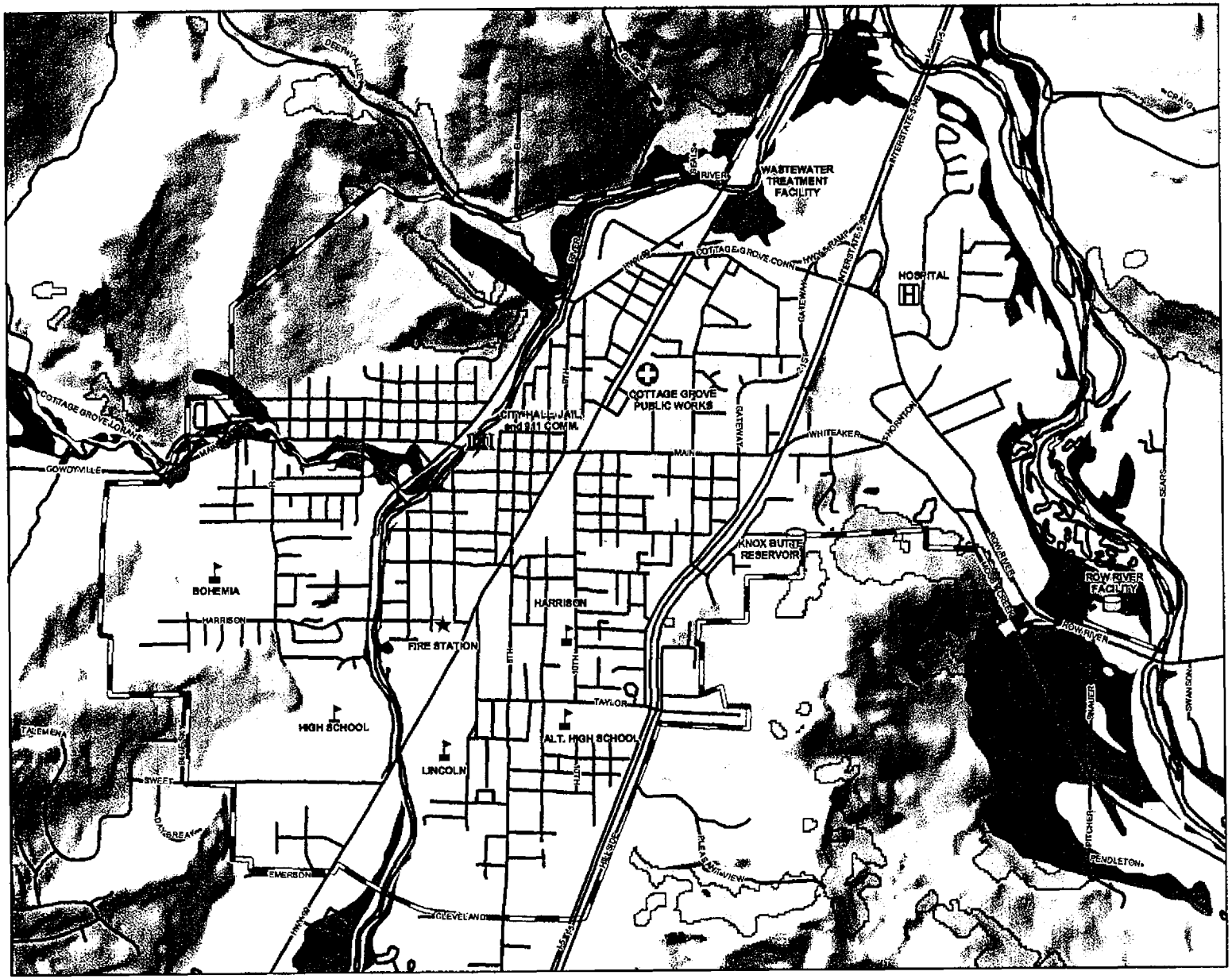
Step 3: Incorporate Criticality of Need, Large Number of Population Served, and Likelihood of Success

The final score for each action item was computed by summing the plan goal score and the hazard score. The criticality of need, the number of population served, and the likelihood of success were then considered. The City was then given an opportunity to add five points to one action item that had a high criticality of need, four points to one action item that had a high probability of success, and three points to one action item that served a large portion of the population. The prioritized action items are as follows.

Table 5-2 Action Item Prioritization Scores

Existing Resources	
Short-Term Multi-Hazard #8	24
Short-Term Multi-Hazard #5	22
Short-Term Landslide #3	21
Short-Term Multi-Hazard #4	17
Short-Term Flood #1	17
Long-Term Winter Storm #1	17
Short-Term Flood #6	16
Short-Term Landslide #2	16
Long-Term Winter Storm #2	15

Funding Required	
Short-Term Multi-Hazard #3	21
Long-Term Multi-Hazard #2	21
Long-Term Multi-Hazard #7	21
Long-Term Multi-Hazard #6	21
Short-Term Flood #7	20
Long-Term Flood #2	20
Short-Term Flood #3	20
Long-Term Flood #5	20
Long-Term Multi-Hazard #1	19
Long-Term Multi-Hazard #7	19
Long-Term Earthquake #2	18
Long-Term Flood #4	17
Long-Term Landslide #1	16
Long-Term Earthquake #1	15
Long-Term Winter Storm #3	15
Short-Term Earthquake #3	14



Natural Hazards in the City of Cottage Grove

0 0.5 Mile

Legend

- 911 Comm. Centers
- Hospitals and Urgent Care
- Schools
- Fire Stations
- Jails, Police Depts., City Halls
- Public Water Treatment/Storage
- Municipal Wastewater Facility
- Public Works Shops
- Urban Growth Boundary
- Debris-Flow Hazard Areas

FLOOD HAZARD ZONES

- Floodway (where mapped)
- 100-Year Flood Zone

Sources:
Debris-Flow Hazard Areas are DOGAMI SB12 Further Review Areas.
Flood Hazard Zones are from FEMA DFIRM data.

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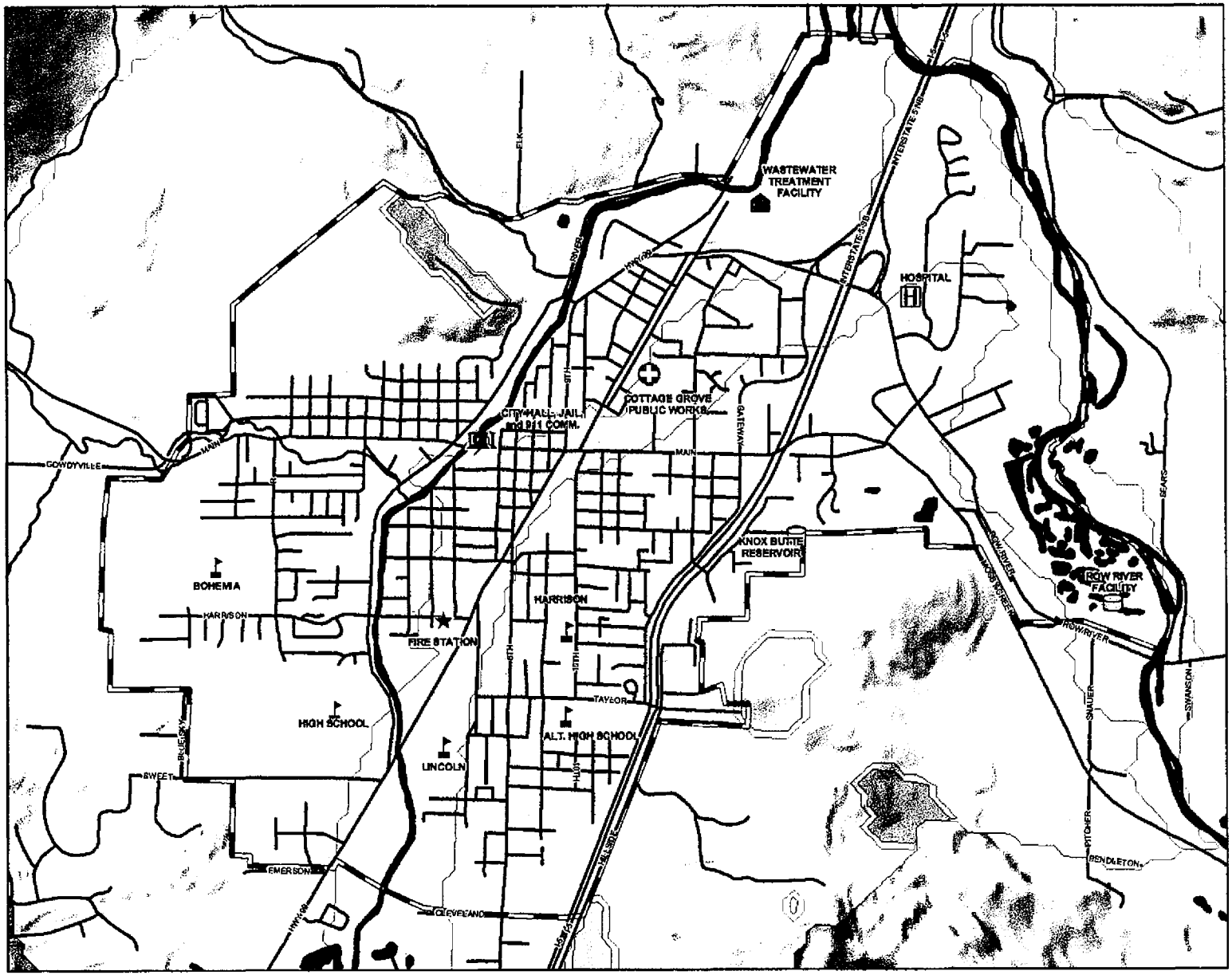
City of Cottage Grove Oregon

Maps produced for City of Cottage Grove, by Lane Council of Governments, under a grant from the Federal Emergency Management Agency.



Relative Earthquake Hazard Zones in Cottage Grove

0 0.5 Mile

Legend

- 911 Comm. Centers
- Hospitals and Urgent Care
- Schools
- Fire Stations
- Jails, Police Depts., City Halls
- Public Water Treatment/Storage
- Municipal Wastewater Facility
- Public Works Shops
- Urban Growth Boundary
- Rivers and Streams (USGS)

RELATIVE EARTHQUAKE HAZARD ZONES

- Zone B - Intermediate to high hazard
- Zone C - Low to intermediate hazard
- Zone D - Lowest hazard

From: Relative Earthquake Hazard Maps of Selected Urban Areas in Western Oregon (IMS-9 Ore. Dept. of Geology and Mineral Industries)

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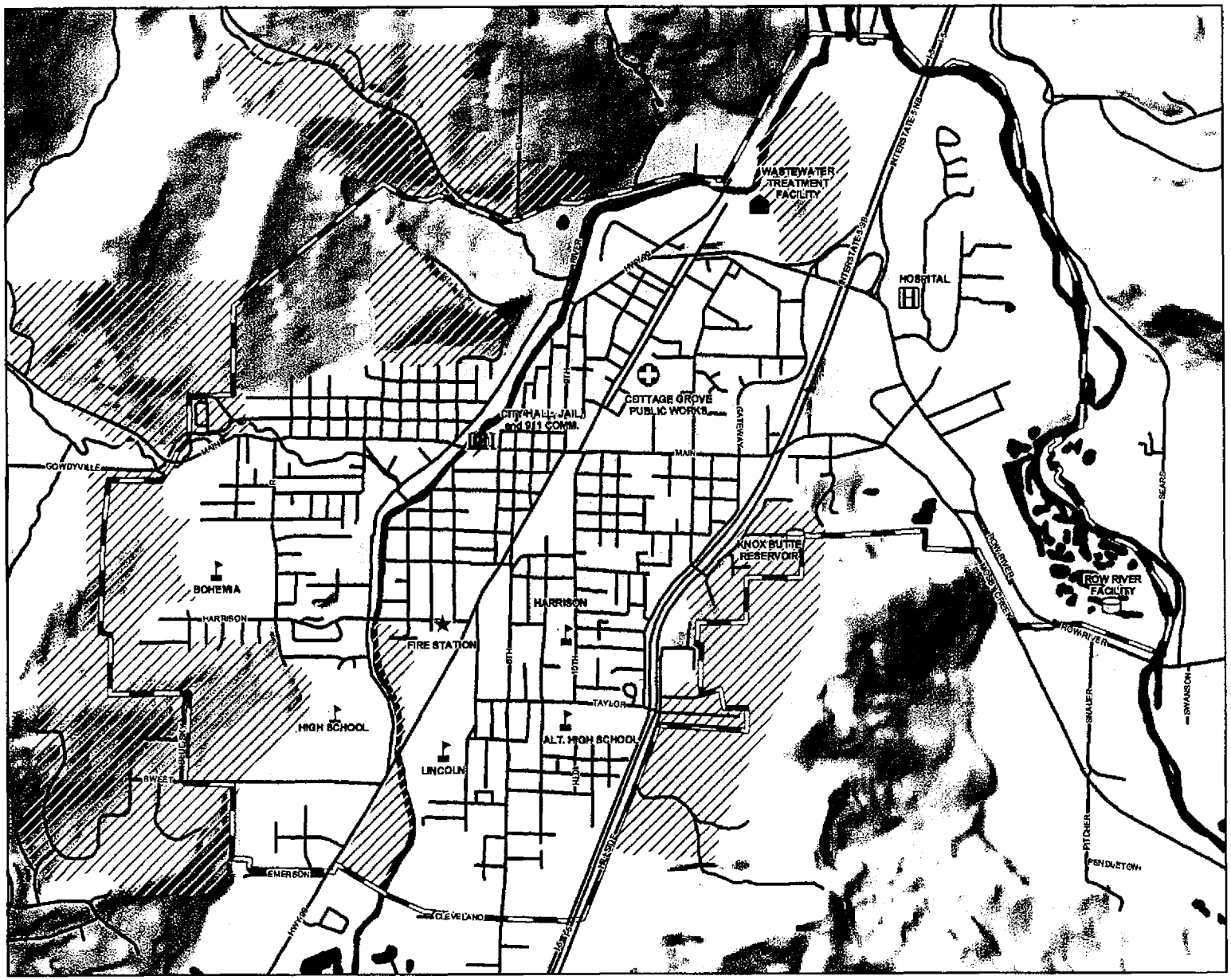
Maps produced for City of Cottage Grove, by Lane Council of Governments, under a grant from the Federal Emergency Management Agency.



Wildland-Urban Interface in Cottage Grove

0 0.5 Mile

Legend

- 911 Comm. Centers
- Hospitals and Urgent Care
- Schools
- Fire Stations
- Jails, Police Depts., City Halls
- Public Water Treatment/Storage
- Municipal Wastewater Facility
- Public Works Shops
- Urban Growth Boundary
- Wildland-Urban Interface Areas

Generalized areas as identified by South Lane County Fire & Rescue District (Fire Marshal Andy McClean)

- Rivers and Streams (USGS)

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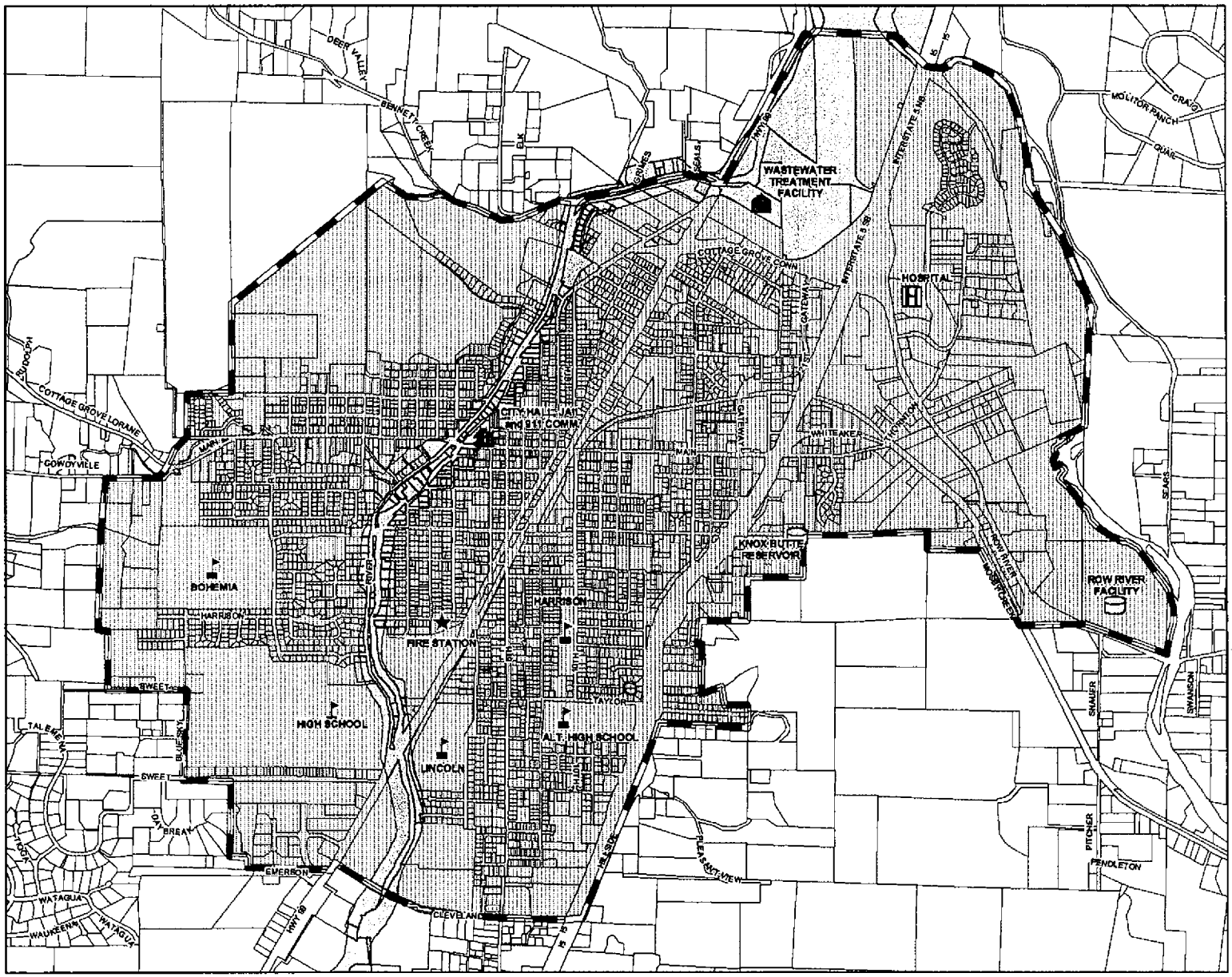
City of Cottage Grove Oregon

Maps produced for City of Cottage Grove, by Lane Council of Governments, under a grant from the Federal Emergency Management Agency.



Willamette Greenway in the City of Cottage Grove

0 0.5 Mile

Legend

- 911 Comm. Centers
- Hospitals and Urgent Care
- Schools
- Fire Stations
- Jails and Police Depts.
- Public Water Treatment/Storage
- Municipal Wastewater Facility
- Urban Growth Boundary
- Willamette Greenway

Sources:
Willamette Greenway digitized by LCOG from Oregon Dept. of Transportation maps.

City of Cottage Grove Oregon

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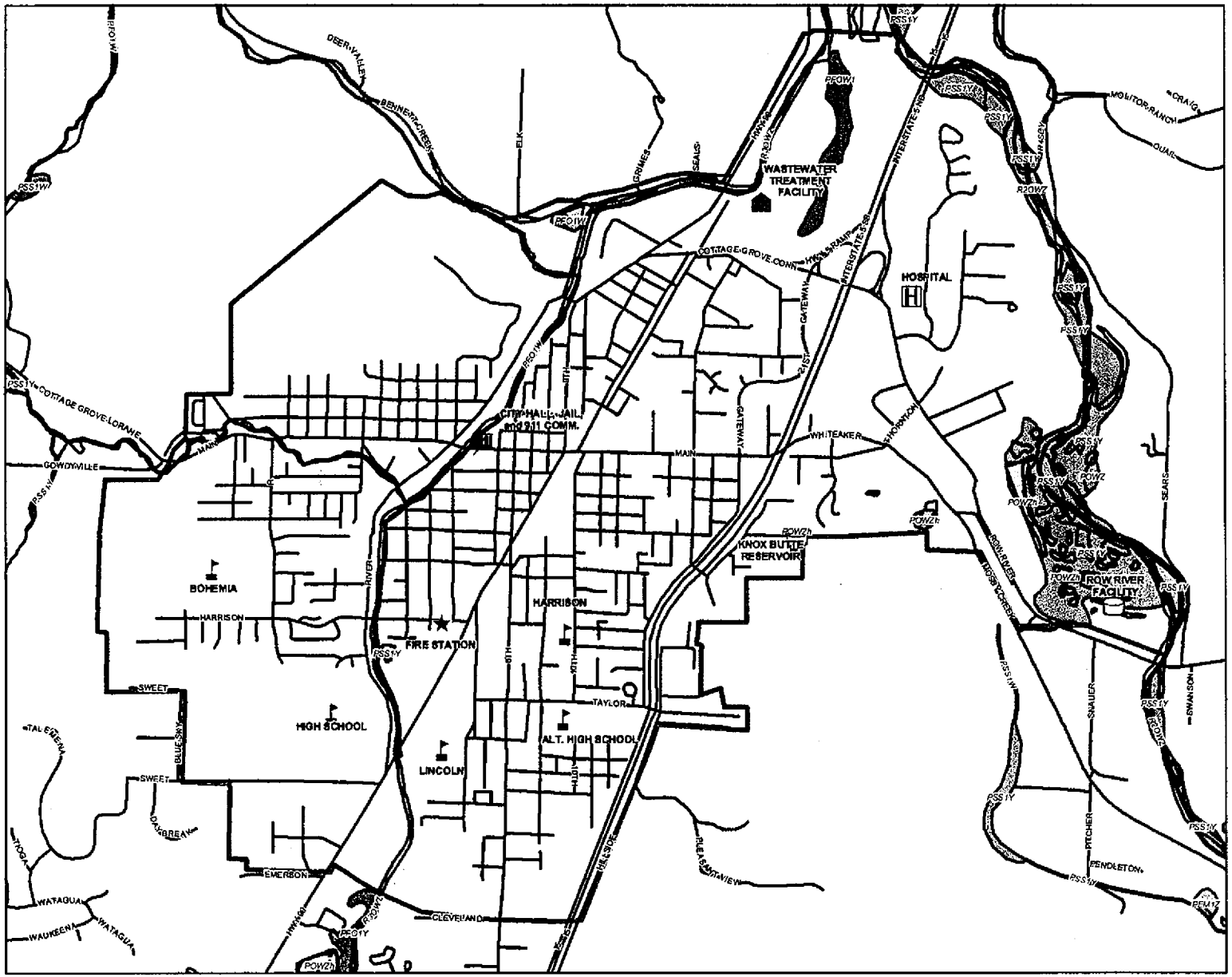
Maps produced for City of Cottage Grove, by Lane Council of Governments, under a grant from the Federal Emergency Management Agency.



National Wetlands Inventory (NWI) in Cottage Grove

0 0.5 Mile

Legend

- Urban Growth Boundaries
- 911 Comm. Centers
- Hospitals and Urgent Care
- Schools
- Fire Stations
- Jails and Police Depts.
- Public Water Treatment/Storage
- Municipal Wastewater Facility
- Rivers and Streams (USGS)
- National Wetlands Inventory

NWI data are from the US Fish & Wildlife Service, and include both wetland areas and linear features. In Lane County, some quadrangles were digitized by US F&WS contractors, and some were digitized by LCOG. Letter codes denote specific types: P = palustrine, R = riverine, SS = scrub/shrub, EM = emergent. For full definition of type codes, go to www.nwi.fws.gov.

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City of Cottage Grove Oregon

LCOG

Maps produced for City of Cottage Grove, by Lane Council of Governments, under a grant from the Federal Emergency Management Agency.

Annex B: City of Cottage Grove Resource Directory

The Cottage Grove Resource Directory is a supplement to the Lane County Multi-Hazard Mitigation Plan. It provides contact information for local agencies that are currently or have the potential to be involved in hazard mitigation activities. The City may look to the organizations in the Resource Directories for partnership opportunities and technical assistance in action item implementation.

Agency	*Contact Information*	*Type of Assistance*
City of Cottage Grove Building Department	Contact: Gary Bood Address: 400 E Main St Cottage Grove, OR 97424 Phone: (541) 942-3340 Email: building@cottagegrove.org	Building Inspection
City of Cottage Grove Finance Department	Contact: Roberta 'Bert' McClintock Address: 400 E Main St Cottage Grove, OR 97424 Phone (541) 942-3346 Email: finance@cottagegrove.org	Financial Support
City of Cottage Grove Library	Contact: Dan Kaye Address: 700 E Gibbs Ave Cottage Grove, OR 97424 Phone: (541) 942-3828 Email: library@cottagegrove.org	Shelter Services/Red Cross Liaison
City of Cottage Grove Planning Department	Contact: Amanda Ferguson Address: 400 E Main St. Cottage Grove, OR 97424 Phone (541) 942-3340 Email: planner@cottagegrove.org	Planning
City of Cottage Grove Public Works	Contact: Bob Sisson Address: 400 E Main St. Cottage Grove, OR 97424 Phone (541) 942-3349	Public Works Storm Water Management Water Treatment Wastewater

Agency	*Contact Information*	*Type of Assistance*
Cottage Grove Volunteer Coordinator	Contact: Wendy Finley Address: 700 E Gibbs Ave. Cottage Grove, OR 97424 Phone: (541) 942-1185 Email: volunteers@cottagegrove.org	Public Information Volunteers
Cottage Grove Community Hospital	Address: 1515 Village Drive Cottage Grove, OR 97424 Phone: (541) 942-0511	Medical Care
Cottage Grove Garbage Service	Address: 522 Whiteaker Ave Cottage Grove, OR 97424 Phone: (541) 942-8321	Garbage Services
Cottage Grove Police Department	Contact: Chief-Mike Grover Address: 400 E Main St. Cottage Grove, OR 97424 Phone: (541) 942-9145	Police Services Evacuation Communication
Cottage Grove Sentinel	Address: 116 N. 6th St. Cottage Grove, OR 97424 Phone: (541) 942-3325	Media

Agency	*Contact Information*	*Type of Assistance*
Department of Forestry	Phone: *Western Lane:* (541) 935-2283 *Eastern Lane:* (541) 726-3588	Forestry
EPUD	Address: 33733 Seavey Loop Rd. Eugene, OR Phone: (541) 746-1583	Utilities
Federal Aviation Administration	Phone: (541) 607-4600	Airport
FEMA	Region X Phone: (425) 487-4604 Fax: (425) 487-4622	Emergency Management
Haz-Mat	Phone: (800) 425-0311	Hazardous Materials Response

Agency	*Contact Information*	*Type of Assistance*
KNND Radio Media	Phone: (541) 942-0193 (541)342-9328	Media/Alert
KVAL TV	Phone: (541) 342-9382	Media/Alert
Lane County Emergency Management	Contact: Linda Cook Phone: (541) 682-6744 Fax: (541) 683-4522	Planning/Coordination
Lane County Public Works	Contact: Public Works Director Phone: (541) 682-6910	Public Works
Lane County Sheriffs Office	Phone: (541) 687-4150 Dispatch: (541) 687-4141	Law Enforcement

Agency	*Contact Information*	*Type of Assistance*
Lane County Waste Management	Glenwood Office (541) 682-4120 Cottage Grove Transfer Station (541) 942-8986	Waste Management
Lane Electric Cooperative	Phone: (541) 484-1115	Utilities
LCOG	Address: 99 E. Broadway, Suite 400 Eugene, OR 97401 Phone: (541) 682-4283 Fax: (541) 682-4099	GIS Mapping Planning
Northwest Natural Gas	Phone: (800) 882-3377	Utilities
Oregon Department of Transportation	Region 2: District 5 Contact: Don Enrich Phone: (541) 726-2552 Dispatch: (800) 776 7718	Transportation

Agency	*Contact Information*	*Type of Assistance*
Pacific Power & Light	Phone: (888) 252-8670	Utilities
Poison Control	Phone: (800) 452-7165 (503) 225-8968	Poison Control/Medical
Red Cross	Phone: (541) 344-5244	Shelter Food/Aid
Register Guard	Phone: (541) 485-1234	Media
South Lane County Fire & Rescue	Contact: Chief-Dan Olsen Address: 233 Harrison Ave. Cottage Grove, OR 97424 Phone: (541) 942-4493 Email: dolsen@southlanefire.org	Fire Suppression Emergency Medical

Agency	***Contact Information***	*Type of Assistance*
South Lane School District	Contact: Colt Gill Address: 455 Adams Ave. Cottage Grove, OR 97424 Phone: (541) 942-3381 Email: cgill@lane.k12.or.us	Transportation Shelter Care
US Army Corp of Engineers	Contact: Herschel Henderly Address: 75819 Shortridge Hill Rd Cottage Grove, OR 97424 Phone: (541) 942-5631	Dams Flood Control

Annex C: Cottage Grove Development Timeline

1848 - First settlers James Chapin and Richard Robinson build on their Donation Land Claims near Cottage Grove.

1850 - Families begin arriving on East Fork of Coast Fork of Willamette River.

1851 - First land claims in Cottage Grove - J. Cochran and William Shields.

1853 - Presbyterian Church organizes at Currin's Oak.

1857 - First lumber mill on Silk Creek built by Hazelton. First store built by Charles Samuels.

1858 - Adams brothers, Oglesby and Shields, find small amount of gold at Sharps Creek.

1861 - Floods hit the area.

1862 - East Coast Fork of the Willamette River name changed to Row River due to the feuds and fusses, one being a cattle and sheep grazing squabble leaving one man dead from gunshot wounds. Another was the suspected killing of a Staple family member by "Bohemia" Sharp over a long-standing fence line fuss although no arrests were ever made.

1863 - "Bohemia" Johnson finds gold in mountains. Knott Trail to "Bohemia" Johnson's mines is built.

1867 - Post office moved to Cottage Grove from Cresswell.

1869 - The first Cottage Grove Hotel is built, it burns in 1906.

1871 - Good Templer's Lodge built on Main Street, the Southern Pacific Railroad reaches Cottage Grove.

1872 - Oregon Central Railroad arrives in Cottage Grove, giving birth to sawmills and logging camps.

1874 - Cottage Grove Grange #75 is organized.

1880 - First school established on Second and Adams Streets. J.C. Stouffer sets up shingle and planning mill on north bank of Silk Creek.

1881 - Telegraph office arrives. Floods in the town.....

1884 - Year of the BIG snow, three feet in December

1887 - First Cottage Grove City Council meeting. Cyclone hits Cottage Grove.

1889 - Telephone comes to Cottage Grove, Pitcher, Harlow, Stocks and Brush build water-powered mill at Pitcher's Falls.

1890 - Population soars from 800 to 3,000, due to the mining boom. Oregon Hotel and Sherwood Hotel built. Oglesby and Pearson discover the "Annie" mine.

1892 - First City water flows in wood pipes from Mt. David Reservoir.

1893 - Cascade Range Forest Reserve created. Cy Bingham gets lost in Layng Creek drainage, Booth Kelly obtains timber lands in Row River drainage, "Warehouse" (Lund Park) built on Brice Creek.

1894 - The town of "Lemati" secedes from Cottage Grove, and stays so until 1898.

1895 - Champion mill built to process free milling ore, Electric power plant built on Brice Creek, Sawmill built at Disston.

1897 - Catholic Church dedicated.

1898 - First telephone exchange with the "hello" girls. Booth Kelly Lumber Company formed. Cottage Grove post office moved on March 28 to east side of river. May 10th the name changed back to the Cottage Grove Post Office.

1900 - George Lea contracts to gravel Main Street, and the rumor begins that the street was paved with gold, as the gravel was from Row River.

1901 - Fire Department established. Telephone line built from Cottage Grove to mines. Cottage Grove incorporated as a town. January flooding - newspaper article on floating down 4th Street in a boat. The Christian Church was established.

1902 - Oregon Southeastern Railroad is formed to service the mining district - (The Old Slow and Easy.)

1903 - Oregon Securities Co. consolidates mining activity and pushes development. Weyerhaeuser picks up timber in Sharps Creek and passes option from Booth Kelly.

1904 - Levi Geer opens the Calapooya Mineral Springs Hotel in London.

1905 - Chambers Lumber Mill opens, logging and milling activity pick up - mining activity slacks.

1906 - Crites & Gawley build sawmill at Disston, San Francisco Earthquake and fire. Local logs shipped to rebuild it.

1907 - Rains and floods are heavy in the area, drainage from creeks and rivers comes to a head in the Cottage Grove area.

1908 - The match factory burned.

1909 - Pacific Highway and Main Street paved. First automobile comes to the community. Train wreck at Currin Bridge. Glenn Scott acquires steam-powered custom threshing outfit.

1910 - Fire on Hawley Mtn., Cottage Grove builds water system, Harlow, Stocks & Hankins build mill below Star called Row River Co. There were 31 lumber companies, Black Butte Quicksilver mine, dairy farming in the Lorane Valley and poultry and farm crops in the Cottage Grove area.

1912 - Clinton and John Spriggs build blacksmith shop at the present day Witt's Lumber Company site on Sixth and Washington. Irrigation projected to use Row River water in Delight Valley. Chambers buys interest in O&SE to maintain shipments from Dorena Mill. Bake Stewart purchases first automobile - a Carter. This is the year the Titanic sank.

1913 - The Masonic Temple addition was constructed on top of the old Eakin & Bristow building.

1914 - World War I - Cottage Grove men called to bear arms. McFarland cemetery deeded to Lane County .Financial troubles on the river, O&SE reorganizes as Oregon Pacific and Eastern.

1916 - Harlow's mortgage foreclosed. Bohemia Lumber Company gets its start.

1917 - The Hotel Bartell opens. Diptheria epidemic claims many lives. Army draft and recruitment depletes valley manpower.

1918 - Cottage Grove Cannery opens.

1919 - The Galloping goose trolley offers Row River passenger service. World-wide "Spanish flu" epidemic. The deep snows.....

1920 - Glenn Scott introduces steampowered custom threshing outfit. Irrigation project to use Row River water in Delight Valley. Chambers buys interest in OP&E to maintain shipments from Dorena mill. City petitions Forestry Service to set aside all of Laying Creek Watershed for use by the city. Train hit a car stalled on the railroad tracks going from 6th street to Monroe Ave., killing 2 or three women and a little girl.

1924 - Bohemia moves to Veatch Spur. Train wreck at Walden.

1925 - The Chambers railroad bridge built across the Coast Fork River.

1926 - The silent movie, "The General" filmed in Cottage Grove. Talkie movies began in 1927. People rode rowboats into the Bartell Hotel.

1929 - Oct. 24 - stock market crashes.....

1930-34 - Depression years - CCC Program - WPA program - 1931 brings Safeway and J.C. Penney's to town. 1932 brings the first celebration of Bohemia Days.....CCC Program establishes camp on Brice Creek.

1931 - Dust storm in April, Huge windstorm in May - 55 trees topple on Brice Creek Road.

1933 - The Mt. David oil derrick crashes, recalling the questionable 1923 scam, and another flood in the town.

1936 - Dorena High School graduates final class of 3.

1938 - Union High School district forms.

1939 - Row River Lumber Co. is formed by Ed Hayes.

1940-43 - Cottage Grove Dam and lake constructed, flooding settlement of Hebron, which was relocated. World War II started. Manpower freezes, rationing.....Sawmills behind every stump.

1941-43 - Dorena Dam and lake constructed, flooding town of Dorena, July of 1941 the Westside school was razed.

1946 - January heavy rains..... 4.32 inches - Floods.

1947 - Cottage Grove replaces wooden water system with steel pipe. Dorena Dam flooding forces families and businesses to move.

1948 - Appeal to Col. Irwin in PUC for better telephone service.

1949 - Winter - Cottage Grove Lake freezes over.....

1950 - Booth Kelly purchases OP&E and Row River Lumber Co. Bohemia and Buffelen Mfg. Co. to build veneer plant at Culp Creek. Interstate 5 constructed through Cottage Grove. LL Stewart is elected to the Oregon Legislature. Cottage Grove Public Library is formed. Lorane Valley Mill burned on Hiway 99 So. formerly the J.H. Chambers Lumber Mill. Korea War.

1952 - Last of "camp houses" destroyed at Culp Creek. Freezing temperatures and snow.

1954 - Industry wide strike of wood products operations.

1956 - Cottage Grove gas plant explodes - many hurt and 3 died.

1958 - Dorena sawmill closes. Cottage Grove Museum created.

1959 - Cottage Grove Manufacturing Plant burned, located east of the railroad tracks on Main Street.

1961 - Feb. floods - 4.74 inches in 24 hours. Silver thaw, broken pipes, trees and power lines.

1962 - Hurricane Frieda (Columbus Day Storm) in Oct. 100 MPH winds. Bohemia purchases Dorena Veneer plant. J.C. Penney, Arcade Theater, Gus Heinrich, Carl Rich Paint Store, Bressler Furniture and Knight Barber Shop burned.

1963 - Bohemia acquires part interest in Cascade Fiber, High water at Christmas.

1964 - Beginning of balloon logging experiments by Bohemia, high water again. Black Butte Mercury Mine is reopened.

1969 - Cottage Grove named Look Magazines "ALL AMERICAN CITY". Heavy snows again. Three foot of snow falls in January. Neil Armstrong walked on moon.

1973 - Fire downtown at Main and Fifth Streets, damage reported at $80,000.

1977 - Sears Building Supply on South 10th Street burned to the ground. "Animal House" filmed in downtown Cottage Grove.

1979 - Gateway Plaza Shopping Center opens.

1980 - Drugs & alcohol are heavy in area, timber industries are down, mills striking. Mt. St. Helens erupts.

1983 - Cable TV - Answering machines and 60" of rain for the year.

1984 - Heavy snows and lots of freezing.

1985 - Flooding in area with heavy rains.

1987 - Centennial Bridge located by City Hall on Main Street.

1988 - Snow heavy

1989 - Dec. fire destroys 4 business in town, 1 death - Catherine Filmer, well known artist. Rain .89 inches in July. Earthquake in San Francisco, Berlin Wall opens.

1993 - March 13 - Earthquake felt from Seattle to Roseburg. Mercury contaminants in Cottage Grove reservoir possibly from the Black Butte Mine.

1994 - New Safeway built.

1996 - Walmart opens. 100" of rain. Dorena Grange Fire.

1997 - The Urban Growth Boundary increased by 276 acres.

1998 - Industrial Park established.

2001 - Truck leaking hydrofluoric acid jams traffic through Cottage Grove and closes schools April 7, 2001.

2002 - Wind storm knocks tree down on gazebo in Coiner Park, many other trees up-rooted in the area.

2003 INFORMATION WAS COMPILED BY MARIE LONGFELLOW FROM THE FOLLOWING SOURCES:

Cottage Grove Sentinel - 100 years of History published in 1999

The Eugene Register Guard - various years

The Oregonian - Portland Newspaper - various years

Eugene City Guard (Barbara Funk Collection, Cottage Grove Museum - 1985)

Cottage Grove Museum

Cottage Grove Historical Society Collection of Natural Disasters

Marcia Allen - Cottage Grove Historical Society

Isabelle Woolcott - Cottage Grove Museum

Joanne Skelton - Cottage Grove Genealogical Society

Betty Quimby - Cottage Grove Genealogical Society

Jane Myers - Cottage Grove Genealogical Society

Carl Kebelbeck - Local Resident Historian

Cottage Grove Timeline in the W.A. Woodard Memorial Library

Early Days in Bohemia Country by Bohemia Inc.

Golden Was The Past 1850 - 1970 published by The Writers Discussion Group in 1970

Historic Use of Six Reservoir Areas in the Upper Willamette Valley, Lane County Or by the US Army Corps of Engineers, 1982

The office staff of the City of Cottage Grove

Economic Analysis of Natural Hazard Mitigation Projects

This appendix was developed by the University of Oregon's Oregon Natural Hazards Workgroup and it outlines three approaches for conducting economic analysis of natural hazard mitigation projects. It describes the importance of implementing mitigation activities, different approaches to economic analysis of mitigation strategies, and methods to calculate costs and benefits associated with mitigation strategies. Information in this section is derived in part from: The Interagency Hazards Mitigation Team, *State Hazard Mitigation Plan,* (Oregon State Police – Office of Emergency Management, 2000), and Federal Emergency Management Agency Publication 331, *Report on Costs and Benefits of Natural Hazard Mitigation*. This section is not intended to provide a comprehensive description of benefit/cost analysis, nor is it intended to provide the details of economic analysis methods that can be used to evaluate local projects. It is intended to (1) raise benefit/cost analysis as an important issue, and (2) provide some background on how economic analysis can be used to evaluate mitigation projects.

Why Evaluate Mitigation Strategies?

Mitigation activities reduce the cost of disasters by minimizing property damage, injuries, and the potential for loss of life, and by reducing emergency response costs, which would otherwise be incurred. Evaluating possible natural hazard mitigation activities 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.

Evaluating mitigation projects is a complex and difficult undertaking, which is influenced by many variables. First, natural disasters affect all segments of the communities they strike, including individuals, businesses, and public services such as fire, police, utilities, and schools. Second, while some of the direct and indirect costs of disaster damages are measurable, some of the costs are non-financial and difficult to quantify in dollars. Third, many of the impacts of such events produce "ripple-effects" throughout the community, greatly increasing the disaster's social and economic consequences.

While not easily accomplished, there is value, from a public policy perspective, in assessing the positive and negative impacts from mitigation activities, and obtaining an instructive benefit/cost comparison. Otherwise, the decision to pursue or not pursue various mitigation options would not be based on an objective

understanding of the net benefit or loss associated with these actions.

What are Some Economic Analysis Approaches for Evaluating Mitigation Strategies?

The approaches used to identify the costs and benefits associated with natural hazard mitigation strategies, measures, or projects fall into three general categories: benefit/cost analysis, cost-effectiveness analysis and the STAPLE/E approach. The distinction between the there methods is outlined below:

Benefit/cost Analysis

Benefit/cost analysis is a key mechanism used by the state Office of Emergency Management (OEM), the Federal Emergency Management Agency, and other state and federal agencies in evaluating hazard mitigation projects, and is required by the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 93-288, as amended.

Benefit/cost analysis is used in natural hazards mitigation to show if the benefits to life and property protected through mitigation efforts exceed the cost of the mitigation activity. Conducting benefit/cost analysis for a mitigation activity can assist communities in determining whether a project is worth undertaking now, in order to avoid disaster-related damages later. Benefit/cost analysis is based on calculating the frequency and severity of a hazard, avoided future damages, and risk. In benefit/cost analysis, all costs and benefits are evaluated in terms of dollars, and a net benefit/cost ratio is computed to determine whether a project should be implemented. A project worth pursuing will have a benefit/cost ratio greater than 1 (i.e., the net benefits will the exceed net costs).

Cost-Effectiveness Analysis

Cost-effectiveness analysis evaluates how best to spend a given amount of money to achieve a specific goal. This type of analysis, however, does not necessarily measure costs and benefits in terms of dollars. Determining the economic feasibility of mitigating natural hazards can also be organized according to the perspective of those with an economic interest in the outcome. Hence, economic analysis approaches are covered for both public and private sectors as follows.

Investing in public sector mitigation activities

Evaluating mitigation strategies in the public sector is complicated because it involves estimating all of the economic benefits and costs regardless of who realizes them, and potentially to a large number of people and economic entities. Some benefits cannot be evaluated monetarily, but still affect the public in profound ways. Economists have developed methods to evaluate the economic feasibility of

public decisions which involve a diverse set of beneficiaries and non-market benefits.

Investing in private sector mitigation activities

Private sector mitigation projects may occur on the basis of one of two approaches: it may be mandated by a regulation or standard, or it may be economically justified on its own merits. A building or landowner, whether a private entity or a public agency, required to conform to a mandated standard may consider the following options:

1. Request cost sharing from public agencies;
2. Dispose of the building or land either by sale or demolition;
3. Change the designated use of the building or land and change the hazard mitigation compliance requirement; or
4. Evaluate the most feasible alternatives and initiate the most cost effective hazard mitigation alternative.

The sale of a building or land triggers another set of concerns. For example, real estate disclosure laws can be developed which require sellers of real property to disclose known defects and deficiencies in the property, including earthquake weaknesses and hazards to prospective purchasers. Correcting deficiencies can be expensive and time consuming, but their existence can prevent the sale of the building. Conditions of a sale regarding the deficiencies and the price of the building can be negotiated between a buyer and seller.

STAPLE/E Approach

Conducting detailed benefit/cost or cost-effectiveness analysis for every possible mitigation activity could be very time consuming and may not be practical. There are some alternate approaches for conducting a quick evaluation of the proposed mitigation activities which could be used to identify those mitigation activities that merit more detailed assessment. One of these methods is the STAPLE/E Approach.

Using STAPLE/E criteria, mitigation activities can be evaluated quickly by steering committees in a systematic fashion. This criteria requires the committee to assess the mitigation activities based on the Social, Technical, Administrative, Political, Legal, Economic, and Environmental (STAPLE/E) constraints and opportunities of implementing the particular mitigation item in your community. The second chapter in FEMA's April How-To Guide "Developing the Mitigation Plan – Identifying Mitigation Actions and Implementation Strategies" as well as the "State of Oregon's Local Natural Hazard Mitigation Plan: An Evaluation Process" outline some specific considerations in analyzing each aspect. The following are

suggestions for how to examine each aspect of the STAPLE/E Approach from the "State of Oregon's Local Natural Hazard Mitigation Plan: An Evaluation Process".

Social: Community development staff, local non-profit organizations, or a local planning board can help answer these questions.

- Is the proposed action socially acceptable to the community?
- Are there equity issues involved that would mean that one segment of the community is treated unfairly?
- Will the action cause social disruption?

Technical: The city or county public works staff, and building department staff can help answer these questions.

- Will the proposed action work?
- Will it create more problems than it solves?
- Does it solve a problem or only a symptom?
- Is it the most useful action in light of other community goals?

Administrative: Elected officials or the city or county administrator, can help answer these questions.

- Can the community implement the action?
- Is there someone to coordinate and lead the effort?
- Is there sufficient funding, staff, and technical support available?
- Are there ongoing administrative requirements that need to be met?

Political: Consult the mayor, city council or county planning commission, city or county administrator, and local planning commissions to help answer these questions.

- Is the action politically acceptable?
- Is there public support both to implement and to maintain the project?

Legal: Include legal counsel, land use planners, risk managers, and city council or county planning commission members, among others, in this discussion.

- Is the community authorized to implement the proposed action? Is there a clear legal basis or precedent for this activity?
- Are there legal side effects? Could the activity be construed as a taking?

- Is the proposed action allowed by the comprehensive plan, or must the comprehensive plan be amended to allow the proposed action?
- Will the community be liable for action or lack of action?
- Will the activity be challenged?

Economic: Community economic development staff, civil engineers, building department staff, and the assessor's office can help answer these questions.

- What are the costs and benefits of this action?
- Do the benefits exceed the costs?
- Are initial, maintenance, and administrative costs taken into account?
- Has funding been secured for the proposed action? If not, what are the potential funding sources (public, non-profit, and private)?
- How will this action affect the fiscal capability of the community?
- What burden will this action place on the tax base or local economy?
- What are the budget and revenue effects of this activity?
- Does the action contribute to other community goals, such as capital improvements or economic development?
- What benefits will the action provide? (This can include dollar amount of damages prevented, number of homes protected, credit under the CRS, potential for funding under the HMGP or the FMA program, etc.)

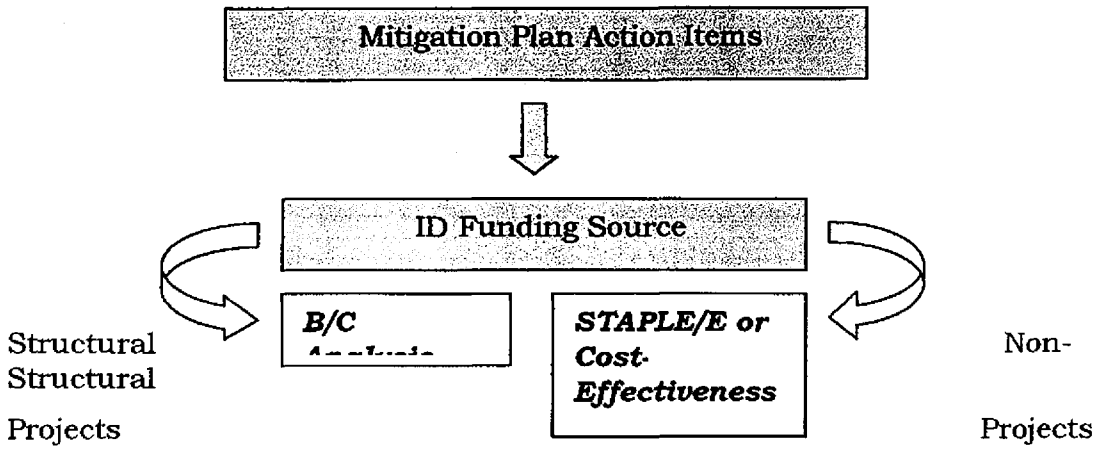
Environmental: Watershed councils, environmental groups, land use planners and natural resource managers can help answer these questions.

- How will the action impact the environment?
- Will the action need environmental regulatory approvals?
- Will it meet local and state regulatory requirements?
- Are endangered or threatened species likely to be affected?

The STAPLE/E approach is helpful for doing a quick analysis of mitigation projects. Most projects that seek federal funding and others often require more detailed Benefit/Cost Analyses.

When to use the Various Approaches

It is important to realize that various funding sources require different types of economic analyses. The following figure is to serve as a guideline for when to use the various approaches.



Implementing the Approaches

Benefit/cost analysis, cost-effectiveness analysis, and the STAPLE/E are important tools in evaluating whether or not to implement a mitigation activity. A framework for evaluating mitigation activities is outlined below. This framework should be used in further analyzing the feasibility of prioritized mitigation activities.

1. Identify the Activities

Activities for reducing risk from natural hazards can include structural projects to enhance disaster resistance, education and outreach, and acquisition or demolition of exposed properties, among others. Different mitigation project can assist in minimizing risk to natural hazards, but do so at varying economic costs.

2. Calculate the Costs and Benefits

Choosing economic criteria is essential to systematically calculating costs and benefits of mitigation projects and selecting the most appropriate activities. Potential economic criteria to evaluate alternatives include:

- ***Determine the project cost.*** This may include initial project development costs, and repair and operating costs of maintaining projects over time.
- ***Estimate the benefits.*** Projecting the benefits, or cash flow resulting from a project can be difficult. Expected future returns from the mitigation effort depend on the correct specification of the risk and the effectiveness of the project, which may not be well known. Expected future costs depend on the physical durability and potential economic obsolescence of the investment. This is difficult to project.

These considerations will also provide guidance in selecting an appropriate salvage value. Future tax structures and rates must be projected. Financing alternatives must be researched, and they may include retained earnings, bond and stock issues, and commercial loans.

- ***Consider costs and benefits to society and the environment.*** These are not easily measured, but can be assessed through a variety of economic tools including existence value or contingent value theories. These theories provide quantitative data on the value people attribute to physical or social environments. Even without hard data, however, impacts of structural projects to the physical environment or to society should be considered when implementing mitigation projects.
- ***Determine the correct discount rate.*** Determination of the discount rate can just be the risk-free cost of capital, but it may include the decision maker's time preference and also a risk premium. Including inflation should also be considered.

3. Analyze and Rank the Activities

Once costs and benefits have been quantified, economic analysis tools can rank the possible mitigation activities. Two methods for determining the best activities given varying costs and benefits include net present value and internal rate of return.

- ***Net present value.*** Net present value is the value of the expected future returns of an investment minus the value of expected future cost expressed in today's dollars. If the net present value is greater than the project costs, the project may be determined feasible for implementation. Selecting the discount rate, and identifying the present and future costs and benefits of the project calculates the net present value of projects.
- ***Internal Rate of Return.*** Using the *internal rate of return* method to evaluate mitigation projects provides the interest rate equivalent to the dollar returns expected from the project. Once the rate has been calculated, it can be compared to rates earned by investing in alternative projects. Projects may be feasible to implement when the internal rate of return is greater than the total costs of the project. Once the mitigation projects are ranked on the basis of economic criteria, decision-makers can consider other factors, such as risk, project effectiveness, and economic, environmental, and social returns in choosing the appropriate project for implementation.

Economic Returns of Natural Hazard Mitigation

The estimation of economic returns, which accrue to building or landowner as a result of natural hazard mitigation, is difficult. Owners evaluating the economic feasibility of mitigation should consider reductions in physical damages and financial losses. A partial list follows:

- Building damages avoided
- Content damages avoided
- Inventory damages avoided
- Rental income losses avoided
- Relocation and disruption expenses avoided
- Proprietor's income losses avoided

These parameters can be estimated using observed prices, costs, and engineering data. The difficult part is to correctly determine the effectiveness of the hazard mitigation project and the resulting reduction in damages and losses. Equally as difficult is assessing the probability that an event will occur. The damages and losses should only include those that will be borne by the owner. The salvage value of the investment can be important in determining economic feasibility. Salvage value becomes more important as the time horizon of the owner declines. This is important because most businesses depreciate assets over a period of time.

Additional Costs from Natural Hazards

Property owners should also assess changes in a broader set of factors that can change as a result of a large natural disaster. These are usually termed "indirect" effects, but they can have a very direct effect on the economic value of the owner's building or land. They can be positive or negative, and include changes in the following:

- Commodity and resource prices
- Availability of resource supplies
- Commodity and resource demand changes
- Building and land values
- Capital availability and interest rates
- Availability of labor
- Economic structure
- Infrastructure
- Regional exports and imports
- Local, state, and national regulations and policies

- Insurance availability and rates

Changes in the resources and industries listed above are more difficult to estimate and require models that are structured to estimate total economic impacts. Total economic impacts are the sum of direct and indirect economic impacts. Total economic impact models are usually not combined with economic feasibility models. Many models exist to estimate total economic impacts of changes in an economy. Decision makers should understand the total economic impacts of natural disasters in order to calculate the benefits of a mitigation activity. This suggests that understanding the local economy is an important first step in being able to understand the potential impacts of a disaster, and the benefits of mitigation activities.

Additional Considerations

Conducting an economic analysis for potential mitigation activities can assist decision-makers in choosing the most appropriate strategy for their community to reduce risk and prevent loss from natural hazards. Economic analysis can also save time and resources from being spent on inappropriate or unfeasible projects. Several resources and models are listed on the following page that can assist in conducting an economic analysis for natural hazard mitigation activities.

Benefit/cost analysis is complicated, and the numbers may divert attention from other important issues. It is important to consider the qualitative factors of a project associated with mitigation that cannot be evaluated economically. There are alternative approaches to implementing mitigation projects. Many communities are looking towards developing multi-objective projects. With this in mind, opportunity rises to develop strategies that integrate natural hazard mitigation with projects related to watersheds, environmental planning, community economic development, and small business development, among others. Incorporating natural hazard mitigation with other community projects can increase the viability of project implementation.

Resources

CUREe Kajima Project, *Methodologies For Evaluating The Socio-Economic Consequences Of Large Earthquakes*, Task 7.2 Economic Impact Analysis, Prepared by University of California, Berkeley Team, Robert A. Olson, VSP Associates, Team Leader; John M. Eidinger, G&E Engineering Systems; Kenneth A. Goettel, Goettel and Associates Inc.; and Gerald L. Horner, Hazard Mitigation Economics Inc., 1997.

Federal Emergency Management Agency, *Benefit/Cost Analysis of Hazard Mitigation Projects*, Riverine Flood, Version 1.05, Hazard Mitigation Economics Inc., 1996.

Federal Emergency Management Agency *Report on Costs and Benefits of Natural Hazard Mitigation.* Publication 331, 1996.

Goettel & Horner Inc., *Earthquake Risk Analysis Volume III: The Economic Feasibility of Seismic Rehabilitation of Buildings in The City of Portland,* Submitted to the Bureau of Buildings, City of Portland, August 30, 1995.

Goettel & Horner Inc., *Benefit/Cost Analysis of Hazard Mitigation Projects* Volume V, Earthquakes, Prepared for FEMA's Hazard Mitigation Branch, October 25, 1995.

Horner, Gerald, *Benefit/Cost Methodologies for Use in Evaluating the Cost Effectiveness of Proposed Hazard Mitigation Measures,* Robert Olson Associates, Prepared for Oregon State Police, Office of Emergency Management, July 1999.

Interagency Hazards Mitigation Team, *State Hazard Mitigation Plan,* (Oregon State Police – Office of Emergency Management, 2000).

Risk Management Solutions, Inc., *Development of a Standardized Earthquake Loss Estimation Methodology,* National Institute of Building Sciences, Volume I and II, 1994.

VSP Associates, Inc., *A Benefit/Cost Model for the Seismic Rehabilitation of Buildings,* Volumes 1 & 2, Federal Emergency Management Agency, FEMA Publication Numbers 227 and 228, 1991.

VSP Associates, Inc., *Benefit/Cost Analysis of Hazard Mitigation Projects: Section 404 Hazard Mitigation Program and Section 406 Public Assistance Program, Volume 3: Seismic Hazard Mitigation Projects,* 1993.

VSP Associates, Inc., *Seismic Rehabilitation of Federal Buildings: A Benefit/Cost Model,* Volume 1, Federal Emergency Management Agency, FEMA Publication Number 255, 1994.