Appendix Three:

Survey of Natural Hazard Mitigation Practices of Cities and Counties in the Portland, Oregon Metropolitan Region, 1997

SURVEY OF
NATURAL HAZARD MITIGATION PRACTICES
BY
CITIES AND COUNTIES
IN THE
PORTLAND, OREGON METROPOLITAN REGION

Natural Hazards Program
Growth Management Services Department

METRO

June 1997

Acknowledgment of Participating Jurisdictions

JURISDICTION	CONTACT	DEPARTMENT	RESPONDENT
Beaverton	Elaine Wilkerson		Mike Mumaw
Clackamas County	David McNeel	**Road Maintenance**	
Clackamas County	Bruce Erickson	**Engineering**	
Clackamas County	Helene Lichtman	**Utilities**	Curt Hohm
Clackamas County	Mike Cliburn	**Planning**	Gary Naylor
Clackamas County	Conrad Kristensen	**Fire Dist.rict 1**	Rob Carnahan
Cornelius	Ben Altman	**Planning**	
Damascus Water District	Denny Klingbile		Denny Klinbile
Durham	Steve Feldman		David Lawson-Taylor
Fairview	John Pettis		John Pettis
Forest Grove	Karl Mawson	**Planning**	
Gladstone	Wayne Hauck	**Fire**	
Gladstone	Jonathan Block	**Planning**	
Gladstone	Larry Canfield	**Public Works**	
Gresham	Max Talbot		
Happy Valley	William Brandon	**Planning**	
Hillsboro	Timothy J Erwert		Sharon Kennedy
Hillsboro	Wink Brooks		Emily Harnish
Johnson City	Robert Lang		
King City	Jane Aamold	**City Manager**	Jane Aamold
Lake Oswego	Douglas J. Schmitz	**Planning**	Larry Goff
Lake Oswego	Tom Coffee	**Planning**	Larry Goff
Maywood Park	Jeff Steffen		Jean Farrell
Milwaukie	Margaret Collins	**Planning**	
Mt. Scott Water District	John Thomas		
Multnomah County	Scott Pemble	**Planning**	Scott Pemble
Multnomah County	Kathy Busse	**Planning**	Robert Hall
Multnomah County	Greg Kirby		
Multnomah County	Larry Nicholas	**Engineering**	
Oak Lodge Sanitary District	Kent Squires		Kent Squires
Oregon City	Rich Carson	**Planning**	
Portland	George Houston	**Fire Bureau**	George Houston
Portland	Bill Elliot	**Bureau of Water**	Bill Elliot
Portland	Lou Bruneau	**Road Maintenance**	
Portland	Margaret Mahoney	**Bureau Buildings**	
Portland	Steve Barrett	**Bureau of Transportation**	Steve Barrett
Portland	Russ Lawrence	**Bureau of Env. Services**	
Portland	Jim Claypool	**Planning**	Jim Claypool
Powell Valley Rd. Water Dist	Tom Pokorny		
Rivergrove	Susan Grayston-Miller		Tami Morrison
Rockwood Water District	Duane Robinson		Duane Robinson
Sherwood	Sue Engels	**Planning**	
South Fork Water Board	Larry Sparling		
Tigard	James Hendryx	**Planning**	Dick Bewersdorf
Troutdale	Richard Faith	**Planning**	Elizabeth A. McCallum

Acknowledgment of Participating Jurisdictions

Tualatin	Jim Jacks	**Planning**	Mary Davis
Tualatin	Dan Boss	**Operations**	
Tualatin	Mike McKillip	**Engineering**	
Tualatin Valley Fire and Rescue & OCEM	Chief Jeff Johnson		Kate Griffith
Tualatin Valley Water Dist.	Jesse Lowman		Gary Pinnin
USA	William Gaffi		John Warren
Washington County	Brent Curtis		
Washington County	H. Dean Frazier	**Land Use & Transportation**	
West Linn	David Monson	**Engineering**	
West Linn	Michael V. Butts	**Planning**	Peter Spir
Wilsonville	Stephan Lashbrook	**Planning**	Paul Silver
Wood Village	Sheila M Ritz		Sheila Ritz

SUMMARY

Since 1992, Metro and the Oregon Department of Geology and Mineral Industries (DOGAMI) have identified earthquakes hazards and seismic risks in the Portland, Oregon metropolitan area. Geologic hazard maps were completed for the Metro region in December, 1997. The evaluation of non-residential buildings for seismic risks will be completed and published in the summer of 1998. The location of many vital systems and key facilities has been identified and a report on the exposure of these systems to earthquake hazard was published July 1998. Vital systems and key facilities include water, sewer, electric, natural gas, telecommunications, transportation, hospitals, fire stations, police, schools, ports, hazardous materials, etc.

Efforts to use the geologic hazard information to develop mitigation policies led into the creation of the Metro Advisory Committee for Mitigating Earthquake Damage report in September 1996. The report, entitled *Using Earthquake Hazard Maps in Land-Use Planning and Building Codes Administration* was designed to help local governments understand and use the geologic hazard maps. The Metro Council then created the Natural Hazards Technical Advisory Committee (HAZTAC) to help Metro staff incorporate natural hazard data in the growth management planning process.

Natural hazards, including floods, landslides, winter storms, windstorms, wildfires and volcanic eruptions have been addressed in chapter five of the Regional Framework Plan (RFP), which is intended to guide future development in the Portland metropolitan area. In addition to the RFP, Metro has initiated development of the Regional Natural Hazard Mitigation Policy and Planning Guide to help local governments with natural hazards mitigation planning.

In order to identify and understand current natural hazard mitigation practices of local governments, a survey of current mitigation practices was sent to local jurisdictions. The results of the survey are described in this report.

In September 1996, Metro sent out 35 questionnaires to 23 jurisdictions including counties, cities, water districts, sanitary districts and a fire district. The survey return rate was over 70 percent.

Of the 25 surveys returned, the majority of jurisdictions had adopted at least one natural hazard mitigation policy. Ordinances and other measures were also in place for most jurisdictions. A few jurisdictions adopted codes or administrative rules related to hazard mitigation. Most jurisdictions had mitigation policies related to earthquake, flood, landslide, windstorm, winter storm, and wildland fire. A few jurisdictions had adopted policies for drought or volcano.

PURPOSE AND OBJECTIVES

Purpose of this Survey

This September 1996 survey was intended to identify current legal instruments such as policies, regulations and administrative rules in use by cities and counties for reducing the potential impact of natural hazards in the Metro region. The objective was to develop a brief survey to gain an understanding of the current mitigation practices of local governments in the region. The following natural hazards were addressed in the survey:

- Earthquake
- Flood
- Landslide
- Wind storm
- Winter (snow) storm
- Wildland Fire
- Drought
- Volcano

METHODOLOGY

The survey provided information on current legal instruments used by local governments in the Metro region to enforce and/or promote natural hazard mitigation actions. Information on four primary legal tools was sought, including:

- Policy Documents
- Ordinances
- Codes or Administrative Rules
- Other Measures

The measures were considered “mitigation tools” if they were developed for the purpose of preventing or reducing the impact of a natural hazard event on the built environment.

Local agencies and departments responsible for the siting, designs, development and maintenance of public facilities were identified. The survey form was sent to key staff in:

- Planning (or land use)
- Building
- Public works (including engineering and road maintenance)
- Water
- Sewer
- Fire

Respondents were asked to describe the type of mitigation tool used by the agency. Respondents could also provide additional comments.

The information received was compiled into a matrix organized by jurisdiction and type of mitigation tool. Another matrix was organized by type of hazard and mitigation tools currently used by local governments. Summaries were tabulated for each matrix.

COMMON MITIGATION PRACTICES

Over 90 percent (23 respondents) have enacted some type of measure related to earthquake, flood, landslide, winter storm, windstorm, wildland urban interface fire or volcano. See Table 1.

Table 1
Type of Measures by Natural Hazard Type

	Earthquake	Flood	Landslide	Windstorm	Winter storm	Fire	Drought	Volcano
Policy	10	13	9	8	7	6	4	5
Ordinance	3	13	8	3	1	2	-	-
Codes or Admin. Rules	2	4	3	1	2	1	1	1
Other	8	10	5	8	8	5	5	7

Examples of these measures include:

- Policy: Emergency Operations Plan (Beaverton, Lake Oswego), Inclement weather plan (City of Portland)
- Ordinance: Zoning and Development Ordinance (Clackamas Couny)
- Codes or Administration Rules: Uniform Building Code (Clackamas County, Hillsboro)
- Other Measures: Seismic upgrades, contracting and intergovernmental agreements with other jurisdictions (Clackamas County, Maywood Park)

Table 2
Type of Measure by Jurisdiction

Jurisdiction	Policy	Ordinance	Codes or Admin. Rules	Other
Beaverton	3	1	2	
Clackamas County	3	3	2	1
Cornelius		1		
Damascus Water District				8
Durham				8
Fairview		1		
Gresham	3			
Hillsboro	3	1	1	
King City				
Lake Oswego	2			1
Maywood park				8
Multnomah County	2	2		
Oak lodge Sanitary District		2		
Oregon City				
Portland	2	1		1
Powell Valley Road Water District				
Rivergrove	1	1	1	
Rockwood Water District				2
Tigard	2	2		
Troutdale	3	3		
Tualatin		1		
Tualatin Valley Water District	2			3
Tualatin Valley Fire & Rescue/OCEM				8
USA		1		5
West Linn	3	2		5
Willsonville	8	1		
Wood Village	8		4	1

Table 2 shows the tabulation for each jurisdiction. More than half of the jurisdictions have adopted a mitigation policy.

OTHER MITIGATION PRACTICES

Twelve of the respondents (48 percent), have “other” mitigation practices. Many of the jurisdictions have conducted seismic safety surveys or studies of their facilities, including Beaverton, Clackamas County, Lake Oswego and Portland. A few of the studies have resulted in the allocation of funds for seismic retrofit of facilities, such as the Portland and Beaverton city halls.

CONCLUSIONS

The survey demonstrated that many jurisdictions in the region have implemented a variety of hazard mitigation measures.

Information obtained in this survey will be used during the regional natural hazard mitigation planning process to ensure that current mitigation practices are understood. Current practices form a strong foundation for identifying future actions to improve regional efforts to reduce vulnerability to natural disaster.

APPENDICES

1. Survey Form
2. Existing Hazard Mitigation Measures by Jurisdiction: 1998

APPENDIX 1: SURVEY FORM

Purpose of this Survey

This survey is intended to identify current policies, regulations and administrative rules in use by cities, and counties for mitigating the potential impact of natural hazards in the Metro region. The following natural hazards are the subject of the survey:

- Earthquake
- Flood
- Landslide
- Wind storm
- Winter (snow) storm
- Wildland Fire
- Drought
- Volcano

SURVEY QUESTIONS

1. Date: _____

2. Jurisdiction _____

3. Name of Respondent: _____

   Job Title: _____

REGULATION

4. Does your jurisdiction have any of the following types of regulations for natural hazard mitigation?

   a) Policy document _____YES _____NO
   (e.g., comprehensive plan containing goals and policies to minimize the impact of disasters on population and property)

   b) Ordinance _____YES _____NO
   (e.g., flood zoning)

   c) Administrative rules or Codes _____YES _____NO
   (e.g., snow/emergency routes, landslide and erosion control codes))

   d) Other measures _____YES _____NO

5. If you answered "yes" please check those hazards for which you have regulations. Use P (for policies, O (for ordinances), A (for administrative rules) and OT for other measures.

_____Earthquake	_____Flood	_____Landslide
_____Wind storm	_____Winter storm	_____Wildland Fire
_____Drought	_____Volcano	

6. What are the references (e.g., ordinance #, code #, title of document) for the policies, ordinances, administrative rules and other measures? Please indicate date the ordinance, code, administrative rules and other measures were adopted or implemented. (Pleas attach extra sheet/s if you need more space to write)

Earthquake_____

Flood_____

Landslide_____
(including erosion and sediment control measures)

Windstorm_____

Winter (snow) storm _____

Wildland Fire_____

Drought_____

Volcano_____

7. What are the sources of the natural hazards information used by your jurisdiction to develop the existing mitigation measures? Please check the items that apply.

Earthquake	USGS_____	FEMA_____	COE_____
Other*_____			
Flood	USGS_____	FEMA_____	COE_____
Other_____			
Landslide	USGS_____	FEMA_____	COE_____
Other_____			
Wind storm	NWS_____	FEMA_____	COE_____
Other_____			
Winter (snow) storm	NWS_____	FEMA_____	COE_____
Other_____			
Wildland Fire	USFS_____	FEMA_____	COE_____
Other_____			

Drought	NWS_____	FEMA_____	COE_____
Other_____			
Volcano	USGS_____	FEMA_____	COE_____
Other_____			

<u>Definitions</u>: *COE = Unites States Army Corps of Engineers*
FEMA = Federal Emergency Management Agency
NWS = National Weather Service
USFS = United States Forest Service
USGS = United States Geological Survey
** other may include consultant*

OTHER MEASURES

If your government has not adopted specific ordinances to reduce vulnerability to natural hazards, there may be other hazard mitigation actions you have taken that would be of interest to other governments in the region. For example, some agencies have chosen to analyze their buildings for earthquake risk. Other agencies have undertaken non-structural mitigation programs such as strapping water heaters to studs or anchoring light fixtures against earthquake shaking . Please use the space below and additional sheets, if needed, to describe non-regulatory hazard mitigation efforts sponsored by your jurisdiction.

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Appendix Two

Existing Hazard Mitigation Measures by Jurisdiction: 1998

(Survey Respondents In Alphabetic Order)

BEAVERTON

Earthquake: City Emergency Operations Plan

Flood: Beaverton Municipal Code (BMC) 9.05; Beaverton Development Code (Ordinance 2050)

Landslide: BMC 9.05; Resolution 3240 Oct.1993; USA R40 91-47 June 1991

Windstorm: City Emergency Operations Plan

Winter Storm: Operations Emergency Route/ Snow Removal Plan

Wildland Fire: Tualatin Valley Fire and Rescue

Other Measures:

- Seismic surveys of city facilities, upgrade City Hall
- Public and employee preparedness training by the Office of Consolidated Emergency Management (OCEM) of Washington County
- Specific mitigation strategy being developed by OCEM of Washington County

CLACKAMAS COUNTY

Earthquake: Uniform Building Code sections 1024, 1804, 1809

Flood: Zoning and Development Ordinance Sections 703, 1003; Uniform Building Code 3107; Clackamas County Defense Emergency Operations Center Plan; Clackamas County Surface Water Management: Rules and Regulations

Landslide: Zone Sections 1002, 1003, 1008; Uniform Building Code 1806
Clackamas County Surface Water Management: Rules and Regulations

Windstorm: Uniform Building Code 1613; Operations Procedure #19

Winter storm: Uniform Building Code 1605; Operations Procedure #19

Wildland Fire: Zoning and Development Ordinance sections 407, 407
Operation Procedure #1
State Fire Marshal Activation Plan

Volcano: Operation Procedure #1

Other Measures:

- In 1998, county is in third year of a five-year seismic upgrade program. All facilities have had non-structural modifications and stored food and water for shelter use
- All structure have auxiliary power supplies.

CORNELIUS

- Cornelius is in the development stage for all-hazard planning.

DAMASCUS WATER DISTRICT

- The Damascus Water District is in the process of developing an Emergency Plan. This plan will address natural hazards such as earthquake, fire, flood, hurricane, thunderstorm and winter storm.

FAIRVIEW

Flood: Flood Plain Ordinance (ORD. 9-1995), Originally adopted 3/7/90

Other measures:

Since 1996, Fairview is has been a partner with Multnomah County and neighboring cities in emergency preparedness and responsepPlanning in East Multnomah County.

HILLSBORO

Earthquake: Chapter 16 Uniform Building Code, CABO (Congress of American Building Officials); Chapter Six; City Emergency Operations Plan

Flood: Chapter 31 Uniform Building Code; City Emergency Operations Plan

Landslide: USA RandO 91-47, June 1991

Windstorm: Chapter 16 Uniform Building Code; City Emergency Operations Plan

Winter Storm: City Emergency Operations Plan

Volcano: City Emergency Operations Plan

LAKE OSWEGO

Earthquake: City of Lake Oswego Emergency Operation Plan: Earthquake Annex

Flood: City of Lake Oswego Emergency Operation Plan: Storm Annex

Windstorm: City of Lake Oswego Emergency Operation Plan/ Storm Annex

Winter Storm: City of Lake Oswego Emergency Operation Plan/ Storm Annex

Wildland Fire: Lake Oswego Fire Wildland/Urban Interface Plan/ Wildland Annex

Other Measures:

- Conducted a seismic survey of city building and water system.
- Main Fire station constructed to seismic zone 4.
- Designated an emergency manager for City 7/1/96.
- Initiated a Community Emergency Response Team (CERT) program.

MAYWOOD PARK

- Resolution 95-121: Intergovernmental Agreement with MCC, Fairview, Gresham, Portland, Troutdale, and Wood Village, Port of Portland, and Fire Districts 14, 20, and 30 to direct that a service delivery study be prepared that identifies the acceptable standard of local preparedness for emergency management, and reviews possible organizational structures to provide emergency management planning within the County.

MULTNOMAH COUNTY

Flood: Multnomah County zone code 11.15.6301

Landslide: Multnomah County zone code 11.15.6700

Wildland Fire: Multnomah County zone code 11.15.2074

OAK LODGE SANITARY DISTRICT

Flood: Ordinance No. 1001 5/93 rev. 1/95

Landslide: Ordinance No. 1001

PORTLAND

Earthquake: Building Code; Earthquake Response Plan

Flood: Building Code; City Code 15.12.020; Flood Control Plan

Landslide: Building code 33.430 (E-zone); City Code 14.20.050, 18.03.050, 17.44.016; Chapter 17.41 City Standard; Construction Specifications Section 209

Windstorm: Inclement Weather Plan, revision in progress Annex II

Winter Storm: Snow and Ice Control Plan, Annex 21

Wildland Fire: Forested and Wildland Interface Areas Fire Protection Plan, Annex 25; City code 3.22.180

Volcano: Ash Control Plan, Volcano Plan, Annex 14

Other Measures:

- Seismic survey of facilities completed: July 3, 1995.
- City offers courses through public education on emergency preparedness and mitigation measures for businesses, high-rise, and industry.
- City emergency plan revision initiated.
- Hazard mitigation report for Flood and Landslide will be submitted to City Council

POWELL VALLEY ROAD WATER DISTRICT

- Has an emergency plan for water contamination.

RIVERGROVE

- **Flood**: Ord # 5.020: Related to areas subject to natural disaster.

ROCKWOOD WATER Public Utility District

- District has an emergency plan.

TIGARD

Flood: Comprehensive Plan Development Code Chapter 18.84

Landslide: Comprehensive Plan Development Code Chapter 18.84; USA rules for erosion control

TROUTDALE

Flood: Troutdale Development Code 4.600 to 4.634.

Landslide: Troutdale Development Code 4.300 to 4.316 and 5.600 to 5.618

Windstorm: Troutdale Development Code Chapter 7, and Troutdale Comprehensive Plan Goal 7

Other Measures:

- All building codes apply Uniform Building Code requirements.

TUALATIN

Flood: Tualatin Development Code: 70.010 Flood Plain District.

Other Measures:

- Seismic upgrade enhancements.

TUALATIN VALLEY FIRE and RESCUE

- Washington County Office of Consolidated emergency management is responsible for hazard mitigation planning.

UNIFIED SEWERAGE AGENCY (USA)

Earthquake: Hazard mitigation study completed in 1995-1996 for wastewater treatment and administrative structures.

Flood: Backflow prevention program to mitigate damage to structures subject to sewer backup during flooding implemented.

WEST LINN

Earthquake: Comprehensive Plan 1984; Zoning ordinance 1984; Uniform Building Code

Flood: Comprehensive Plan 1984; Zoning Ordinance 1984; Uniform Building Code

Landslide: Comprehensive Plan 1984; Zoning Ordinance 1984; Municipal Code 1995; Uniform Building Code

Windstorm: Uniform Building Code

Winter Storm: Uniform Building Code

WILSONVILLE

Earthquake: Comprehensive Plan Objective 4.4.11, 11/88

Flood: Comprehensive Plan Objective 4.4.11, 11/88 and Development Code Section 4.162, 1/95

Landslide: Comprehensive Plan Objective 4.4.11, 11/88

Windstorm: Comprehensive Plan Objective 4.4.11, 11/88

Winter Storm: Comprehensive Plan Objective 4.4.11, 11/88

Wildland Fire: Comprehensive Plan Objective 4.4.11, 11/88

Drought: Comprehensive Plan Objective 4.4.11, 11/88

Volcano: Comprehensive Plan Objective 4.4.11, 11/88

Other Measures:

- The City is revising it's Emergency Operations Plan.

WOOD VILLAGE

Flood: Stormwater Master Plan adopted Jan. 4, 1996

Landslide: All development proposals reviewed for potential hazard

Windstorm: Public Works Administrative Procedures

Winter Storm: Public Works Administrative Procedures

Wildland Fire: Administrative Procedures for plowing fields for fire break.

Drought: Public Works Administrative Procedures