

Chelan County Multi-Jurisdiction Natural Hazard Mitigation Plan

2011 Plan Update

Breaking the Disaster Cycle:
Planning for a Disaster-Resistant Chelan County

Plan developed for:

Chelan County and the Cities of Cashmere, Chelan, Entiat, Leavenworth, and Wenatchee

Prepared by:

Chelan County Emergency Management Council and its member jurisdictions, including Chelan County Emergency Management (Sheriff), Chelan County Natural Resource Department, and the Cities of Cashmere, Chelan, Entiat, Leavenworth, and Wenatchee

Original Plan Developed October 2004
Update Completed December 2011

Funding Acknowledgements:

The Chelan County Multi-jurisdiction Natural Hazard Mitigation Plan was funded by a grant from Washington State Military Department: Emergency Management Division; Chelan County and the City of Wenatchee.

TABLE OF CONTENTS

	Page
Section I: Overview	
Executive Summary-----	3
Point of Contact-----	4
Purpose-----	5
Plan Methodology-----	6
Plan Development Process-----	9
Plan Adoption-----	11
Plan Maintenance-----	12
Implementation Program-----	15
Benefit-Cost Analysis Review-----	17
Section II: Natural Hazard Risk Assessments	
Overview-----	21
Flooding-----	22
Earthquake-----	28
Severe Storms-----	31
Volcanic Hazard-----	35
Landslide-----	37
Drought-----	39
Wildfire-----	41
Avalanche-----	44
Section III: Policy and Program Analysis-----	46
Section IV: Natural Hazard Mitigation Strategy-----	54
Overview-----	54
Mitigation Strategy Development-----	54
Prioritization of Mitigation Actions-----	55
Multi-hazard Mitigation Actions-----	57
Flood Hazard Mitigation Actions-----	60
Earthquake Hazard Mitigation Actions-----	63
Severe Storm Hazard Mitigation Actions-----	66
Volcanic Hazard Mitigation Actions-----	69
Landslide Hazard Mitigation Actions-----	70
Drought Hazard Mitigation Actions-----	72
Wildfire Hazard Mitigation Actions-----	73
Avalanche Hazard Mitigation Actions-----	76
Section V: Jurisdiction-Specific Natural Hazard Sub-Plans-----	77
City of Cashmere-----	78
City of Chelan-----	86
City of Entiat-----	92
City of Leavenworth-----	98
City of Wenatchee-----	105
Chelan County Unincorporated Areas-----	122
Appendix A: Public Workshop Meeting Notices and Meeting Minutes-----	
Appendix B: Natural Hazard Maps-----	

Executive Summary

The Chelan County Multi-Jurisdiction Natural Hazard Mitigation Plan Update has been developed to comply with the requirements of the Federal Disaster Mitigation Act of 2000 and subsequent updates. The Chelan County Emergency Management Council and its member jurisdictions led the development of the update and contributed significant staff time towards its development. Update development support was also provided through a grant from the Washington Emergency Management Division. Coordination and final compilation of the update was provided by the Chelan County Natural Resource Department. The EMC provided extensive public outreach opportunities throughout the update and coordinated with other interests in the development of the plan.

The mission statement of the Plan remains the same in the update and is as follows: *to promote sound public policy designed to protect citizens, critical facilities, infrastructure, private property and the environment from natural hazards by increasing public awareness, documenting the resources for risk reduction and loss-prevention, and identifying activities to guide Chelan County towards building a safer, more sustainable community.* Through an evaluation of local jurisdictions and their assets, a review of natural hazard risks present in the community, and a strategic approach to mitigating hazard risks, the Plan fulfills its mission statement. Future efforts to evaluate and revise the Plan will build upon this update.

The update shows that communities within Chelan County continue to be subject to a number of natural hazards, including flooding, earthquake, severe storms, volcanoes, landslide, drought, wildfire, and avalanche. While all of these hazard events could occur, and have occurred, within the County and its communities, wildfire, flooding, severe storms, drought, and earthquake stand out as the predominant hazard risks. Annually, wildfire, flooding, and severe storms occur. The location, extent, history, and vulnerability of these events is well-documented in this update. Also documented are the local existing natural hazard policies and programs that could mitigate some of the effects of natural disasters if sufficient resources were available.

The Mitigation Strategy is the heart of the plan and outlines various actions that, given sufficient funding, could be implemented to address natural hazard disasters. From developing disaster response plans to encouraging landowners through incentive programs to avoid disaster areas, the plan covers a breadth of activities that would mitigate the effects of natural disasters. These actions have been prioritized by the local community and represent a sound approach to addressing local hazards that is most acceptable to the local community. The update produced minor adjustments to the Mitigation Strategy that more accurately reflect current approaches to address natural hazard disasters.

Finally, the updated jurisdiction-specific sub-plans provide a focused and strategic approach to addressing natural hazard risks in the cities of Cashmere, Chelan, Entiat, Leavenworth, and Wenatchee and the unincorporated areas of Chelan County. Building upon the larger plan that addresses natural hazards at the County level, these sub-plans provide a close look at the demographics, critical facilities, development trends, and vulnerabilities of the cities in Chelan County. The unincorporated areas sub-plan documents extensively the community assets in rural Chelan County and relies on the larger mitigation strategy for mitigation actions.

Point of Contact

The Point of Contact for information regarding the Chelan County Multi-jurisdiction Natural Hazard Mitigation Plan is the following:

Mike Kaputa, Director
Chelan County Natural Resource Department
316 Washington Street
Wenatchee, WA 98801
Work: (509) 667-6584
Cell: (509) 670-6935
FAX: (509) 667-6527
e-mail: mike.kaputa@co.chelan.wa.us

Purpose

The Disaster Mitigation Act of 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act by, among other things, adding a new section, 322-Mitigation Planning. Section 322 places new emphasis on hazard mitigation planning. It requires local governments to develop and submit mitigation plans as a condition of receiving Hazard Mitigation Grant Program and Pre-Disaster Mitigation Program Funds. 44CFR Part 201 outlines the key responsibilities of local governments in carrying out Section 322.

The regulatory directive included in the Federal Statement of Purpose, under 44 CFR 201.1 subpart (b) states that:

“The purpose of mitigation planning is for State, local, and Indian tribal governments to identify the natural hazards that affect them, to identify actions and activities to reduce losses from those hazards, and to establish a coordinated process to implement the plan, taking advantage of a wide range of resources.”

The Chelan County Multi-Jurisdiction Natural Hazard Mitigation Plan meets the federal requirements outlined under the Act for the local governments in Chelan County, Washington, including Chelan County (including the unincorporated areas of Chelan County) and the cities of Cashmere, Chelan, Entiat, Leavenworth, and Wenatchee.

The mission of the Plan is *To promote sound public policy designed to protect citizens, critical facilities, infrastructure, private property and the environment from natural hazards by increasing public awareness, documenting the resources for risk reduction and loss-prevention, and identifying activities to guide Chelan County towards building a safer, more sustainable community.*

The Chelan County Plan goals are listed in priority order as follows:

1. **To Protect People** by implementing activities that assist in protecting lives
2. **To Protect Property** by making Chelan County homes, businesses, infrastructure, critical facilities, and other property more disaster-resistant to losses from natural hazards
3. **To Protect Economy** by developing mechanisms that ensure that commerce, trade, and essential business activities remain viable in the event of a natural disaster
4. **To Protect Environment** by preserving, rehabilitating, and enhancing natural systems to serve natural hazard mitigation functions
5. **To Strengthen Emergency Services** by increasing collaboration and coordination among public agencies, non-profit organizations, business, and industry
6. **To Increase Public Awareness and Education** by providing public awareness and education on natural hazards as well as tools and funding resources to assist in implementing mitigation activities
7. **To Establish and Strengthen Partnerships for Implementation** by coordinating and collaborate among public agencies, citizens, non-profit organizations, businesses, tribes, and industry whose authorities and capabilities will support implementation of planning for a disaster-resistant Chelan County

Plan Methodology

In an effort to coordinate and integrate various hazard planning activities, the Chelan County Emergency Management Council (EMC) chose to lead the development of the Chelan County Natural Hazard Mitigation Plan in 2004 and again led the 2010 update. The EMC is comprised of the Chelan County Commissioners, Chelan County Sheriff, and Mayors from the Cities of Cashmere, Chelan, Entiat, Leavenworth, and Wenatchee.

The Chelan County Natural Hazards Mitigation Plan is multi-jurisdictional and satisfies the natural hazards mitigation planning requirements as specified in the Disaster Mitigation Act of 2000 for Chelan County and the cities within Chelan County, including Cashmere, Chelan, Entiat, Leavenworth, and Wenatchee. The plan was developed following the process outlined by the Disaster Mitigation Act of 2000. The update follows guidelines provided by FEMA 386-8: *Multijurisdictional Mitigation Planning* (August 2006), FEMA's *Local Multi-Hazard Mitigation Planning Guidance* (July 2008), and other FEMA guidance.

The 2010 update to the **Chelan County Multi-Jurisdiction Natural Hazard Mitigation Plan** was written using the best available information obtained from a wide variety of sources, including the Chelan County Comprehensive Plan, the Chelan County Hazard Inventory and Vulnerability Assessment, the City of Wenatchee Hazard Inventory and Vulnerability Assessment, the Washington State Hazard Risk Assessment (Draft), professional judgment from a wide array of qualified contributors, and local officials and their representatives. Throughout the update process, a concerted effort was made by the planning committee to gather information from participating agencies as well as stakeholders, business and industry, and the citizens of Chelan County. A concerted effort was made to solicit information from local agencies and individuals with specific knowledge of certain natural hazards and past historical events, as well as planning and zoning codes and ordinances and recent planning decisions.

The natural hazard mitigation strategies contained within this plan are the result of a planning process involving all local jurisdictions, special purpose districts, and a cross-section of the business community and citizens of Chelan County.

Establishment of the Chelan County Natural Hazards Planning Committee

The Chelan County Emergency Management Council designated key staff to serve on the Chelan County Natural Hazards Planning Committee for the 2010 update. The Chelan County Natural Resource Department served as project manager for the planning committee to meet the requirements of the planning grant process and to keep the mitigation-planning project on schedule. The committee was charged with the following responsibilities:

- Establish plan development goals and objectives.
- Establish a time line for completion of the plan.
- Insure that the plan meets the requirements of the Disaster Mitigation Act of 2000
- Solicit and encourage the participation of the public in the plan development process.
- Assist Chelan County Natural Resource Program in gathering information for inclusion in the plan.
- Organize and oversee the public involvement process.
- Gather all pertinent information to be included in the plan.

- Complete a draft plan for review by the EMC elected officials

Chelan County Emergency Management Council (EMC) Members

- Chelan County Commissioner (EMC Chair)
- Chelan County Sheriff
- Mayor of Cashmere
- Mayor of Chelan
- Mayor of Entiat
- Mayor of Leavenworth
- Mayor of Wenatchee

Chelan Natural Hazards Mitigation Planning Committee Members

- Chelan County Natural Resource Department Director
- Chelan County Emergency Management Director
- Chelan County Emergency Management Public Information Officer
- City of Cashmere Public Works Director
- City of Chelan Planning Director
- City of Entiat Planning Director
- City of Leavenworth Public Works Director
- City of Wenatchee Fire Chief

Plan Development Schedule

The Planning Committee outlined the following schedule in May 2009 for updating the natural hazards mitigation plan.

Activity	Completion Date
Review draft by-laws, operating procedures, and goals and objectives	May 30, 2009
Update jurisdiction profiles	July 30, 2009
Update hazard inventories	August 30, 2009
Update vulnerability assessments	August 30, 2009
Review comprehensive plans, policies, and programs	August 30, 2009
Update possible mitigation actions	September 30, 2009
Submit final draft update to WA EMD	December 2011

Hold local public meeting-----February 2012

Submit final plan to WA Emergency-----March 2012
Management Division

Summary of Plan Development Schedule

The planning committee reviewed the existing by-laws and operating procedures of the Chelan County Emergency Management Council. Jurisdiction profiles, hazard inventories, and vulnerability assessments were updated by each jurisdiction using a variety of information sources, including the Washington State Hazard Mitigation Plan and the Chelan County and City of Wenatchee Hazard Inventory and Vulnerability Assessments (HIVAs). The Chelan County Natural Resource Department compiled all of the updated information and worked with the Chelan County Sheriff (Emergency Management) to update County portions of the plan and the overall plan. The plan was submitted to WA Emergency Management Division in December 2011 for preliminary review and subsequently adopted, with the recommended changes, by all local jurisdictions in February 2012.

Hazard Specific Research

The Chelan Natural Hazards Planning Committee developed the 2010 update by collecting information available since original plan development in 2004 to address the eight natural hazards affecting Chelan County, including avalanche, drought, earthquake, fire, flood, landslides, severe storms, and volcanic activity. Update information was obtained from local historical records, and a wide variety of local, state, and federal agencies as well as the above referenced stakeholder interviews and public workshops. In addition, a great deal of information was obtained from existing plans and numerous sources via the internet.

Plan Development Process

Federal Guidelines in the Disaster Mitigation Act of 2000

In the past, federal legislation has provided funding for disaster relief, recovery, and hazard mitigation planning. The Disaster Mitigation Act of 2000 is the latest legislation to improve this planning process and was put into motion on October 10, 2000, when the President of the United States signed the Act (Public Law 106-390). The new legislation reinforces the importance of mitigation planning and emphasizes planning for disasters before they occur.

Mitigate: to cause to become less harsh or hostile; to make less severe or painful.

Planning: the act or process of making or carrying out plans; the establishment of goals, policies, and procedures for a social or economic unit.

Hazard Mitigation (as defined by the Disaster Mitigation Act of 2000): any sustained action taken to reduce or eliminate the long-term risk to humane life and property from hazards.

The Disaster Mitigation Act of 2000 is intended to facilitate cooperation between state and local authorities, prompting them to work together. It encourages and rewards local and state pre-disaster planning and promotes sustainability as a strategy for disaster resistance.

To implement the new Disaster Mitigation Act of 2000 requirements, the Federal Emergency Management Agency (FEMA) prepared an Interim Final Rule, published in the Federal Registry on February 26, 2002, at 44 CFR Parts 201 and 206, which establishes planning and funding criteria for state and local governments.

The primary purpose of hazard mitigation is to identify community policies, actions, and tools for implementation over the long term that will result in a reduction in risk and potential for future losses community-wide. This is accomplished by using a systematic process of learning about the hazards that can affect the community, setting clear goals, identifying appropriate actions, following through with an effective mitigation strategy, and keeping the plan current.

Local Development of the Plan

The 2010 update to the **Chelan County Multi-jurisdiction Natural Hazards Mitigation Plan** is the result of a focused effort on the part of EMC, their staff, and considerable public outreach and involvement meetings. The Chelan County Emergency Management Council coordinated development of the plan by overseeing the development of the plan and contributing staff to support development. EMC met quarterly to review plan development progress. Staff from Chelan County and the cities of Cashmere, Chelan, Entiat, Leavenworth, and Wenatchee developed the plan components and met monthly or bi-monthly. These staff represented the same jurisdictions as those who participated in the original 2004 plan development. Staff from the Chelan County Natural Resource Department were responsible for overall plan development, coordination, writing, and communication with Washington EMD staff. County and City staff jointly developed the Mitigation Strategy

and updated their respective sub-plans using a standardized format. The Plan Maintenance section addresses inclusion of special purpose districts either through an emergency inclusion process or annual review of the plan. Special districts were informally contacted and did not express interest in the planning effort, only a way to opt-in if necessary either through an emergency process or during annual review. Due to the largely rural nature of Chelan County and limited resources of the special purpose districts, the Emergency Management Council felt that a partner inclusion process would adequately address special purpose districts and their ability to participate in the future. Funding for the plan came from a grant from Washington Emergency Management Division, Chelan County and the City of Wenatchee. The table below outlines the roles and responsibilities of the various entities who participated in development of the plan.

<i>Participating Entity</i>	<i>Role</i>
Chelan County Emergency Management Council	Coordination, policy oversight, plan development
Chelan County Natural Resource Department	Technical writer, plan coordination, grant management, public outreach
Chelan County Sheriff (Emergency Management)	Technical oversight, plan development
City of Wenatchee	Sub-plan development and public outreach
City of Cashmere	Sub-plan development and public outreach
City of Chelan	Sub-plan development and public outreach
City of Entiat	Sub-plan development and public outreach
City of Leavenworth	Sub-plan development and public outreach
Special Purpose Districts	Noted in sub-plans

Plan Adoption

The Chelan County Multi-jurisdiction Natural Hazard Mitigation Plan is being submitted for pre-approval to FEMA prior to adoption by the local jurisdictions

The following jurisdictions have adopted the Chelan County Natural Hazard Mitigation Plan. Copies of the final resolutions are included in the appendix.

Jurisdiction	Governing Body	Resolution Number	Adoption Date
Chelan County	County Commission		
City of Cashmere	City Council		
City of Chelan	City Council		
City of Entiat	City Council		
City of Leavenworth	City Council		
City of Wenatchee	City Council		

Plan Maintenance

Evaluating and Updating the Plan

The **Chelan County Multi-jurisdiction Natural Hazard Mitigation Plan** will be evaluated on an annual basis by the Emergency Management Council to determine the effectiveness of mitigation programs, projects, or other related activities and to reflect changes in land development or programs that may affect mitigation priorities and/or strategies. The plan will be updated every five years. Five-year updates will be delivered to the Washington State Hazard Mitigation Officer for review and forwarding to the Federal Emergency Management Agency, Region X Office. This 2011 update reflects the same general format with no noticeable format or layout changes from the 2004 plan. 2011 revisions are embodied in their respective sections. The EMC felt that the existing format of the plan was adequate for the 2011 revisions and did not warrant any structural changes to the plan.

Future Plan Partner Inclusion

The Chelan County Emergency Management Council developed this plan to cover the majority of residents and structures in Chelan County and its jurisdictions; however, there are innumerable special purpose districts and others (e.g. schools, irrigation districts, etc.) who play a vital role in the community and could be adversely affected by natural disasters. Many of these special purpose districts and their infrastructure are identified in the *City Sub-Plans* and *Unincorporated Chelan County Sub-Plan*. The EMC will continue to develop the plan and strive to include as many “new members” into the plan as possible on an annual basis through a regular new member inclusion process.

The following steps must be followed for a new partner to be included in the plan.

1. The new partner who wishes to join the plan contacts Chelan County Emergency Management with the request to become a participant of the plan.
2. Chelan County Emergency Management provides the new partner with a copy of the approved plan, planning requirements and any other pertinent data.
3. The new partner reviews the plan and develops the portions of the plan that are specific to the new partner as directed by Chelan County Emergency Management. This portion of the plan must meet the requirements of the current FEMA Local Multi-Hazard Mitigation Planning Guidance and include a public process.
4. The new partner submits its portions of the plan to Chelan County Emergency Management, and the new partner plan is forwarded to the State Hazard Mitigation Program Manager for review and compliance with current FEMA Local Multi-Hazard Mitigation Planning Guidance.
5. The State Hazard Mitigation Program Manager reviews the new community plan for compliance with current Local Multi-Hazard Mitigation Planning Guidance in conjunction with the **Chelan County Multi-Jurisdiction Natural Hazard Mitigation Plan**. If the new partner plan does not meet the required standard, the State Hazard Mitigation Program Manager will work with the community to resolve issues until it does.

6. The State Hazard Mitigation Program Manager forwards the new community plan to FEMA Region X for review and approval.

7. Upon approval from FEMA Region X, the new partner is considered part of the **Chelan County Multi-Jurisdiction Natural Hazards Mitigation Plan** and will comply with the update schedule of the plan and the Chelan County Natural Hazards Mitigation Planning Committee.

New Partner Emergency Inclusion Process

Additionally, the EMC establishes the following emergency inclusion process to bring in new partners in the event of the declaration of a natural disaster and the offering of disaster mitigation funding, which typically occurs within 90 days of disaster declaration.

New Partner Emergency Inclusion Process	
Event	Timeline
Declaration of natural disaster begins timeline OR new partner identifies potential pre-disaster mitigation funding opportunity	
New partner submits sub-plan following examples in plan	Days 0-30
County EMD reviews sub-plan/requests changes, if necessary	Days 31-41
EMC adopts sub-plan into overall County plan	Days 41-51

Annual Plan Evaluation

In an effort to facilitate the annual plan evaluation process, the Chelan County Emergency Management Council shall be charged with the responsibility of conducting an annual plan evaluation during the months of July, August, and September of each calendar year. The Director of the Chelan County Department of Emergency Management or his/her designee will be responsible for contacting the chairperson and members of the Chelan County Natural Hazards Mitigation Planning Committee and organizing the annual plan evaluation process.

The Chelan County Natural Hazards Mitigation Planning Committee will review the current natural hazards mitigation strategies to determine their relevance to changing situations within Chelan County, as well as known changes in State or Federal policy, and insure that these mitigation strategies are addressing current and expected conditions.

Following the annual plan evaluation process, the Chelan County Department of Emergency Management will prepare a written report describing: 1) the plan evaluation process; 2) the status of any current mitigation activities or projects; 3) any deficiencies identified as a result of the plan evaluation. Copies of this report shall be mailed to the members of the Chelan County Emergency Management Council. In addition, a copy of this report will also be mailed to the Washington State Hazard Mitigation Officer no later than September 30th of each calendar year.

Five-Year Plan Update

Updates to the **Chelan County Natural Hazards Mitigation Plan** shall be conducted on a five-year cycle and shall commence at the direction of the Director of the Chelan County Department of Emergency Management no later than March 1st of the scheduled update year. Upon such direction, staff from the Chelan County Department of Emergency Management or the Director's designee will begin the process of updating the plan.

The members of the Chelan County Emergency Management Council shall approve the updated plan and a copy of the updated plan shall be submitted to the Washington State Hazard Mitigation Officer no later than September 30th of the update year.

PLAN EVALUATION AND UPDATE SCHEDULE 2013 – 2017	
Date	Required Action to be Taken
July-September 2013	Conduct plan evaluation and public meeting
September 2013	Submit written report to Washington State Hazard Mitigation Officer
July - September 2014	Conduct plan evaluation and public meeting
September 2014	Submit written report to Washington State Hazard Mitigation Officer
July-September 2015	Conduct plan evaluation and public meeting
September 2015	Submit written report to Washington State Hazard Mitigation Officer
July-September 2016	Conduct plan evaluation and public meeting
September 2016 February 2017	Submit written report to Washington State Hazard Mitigation Officer Director of the Chelan County Department of Emergency Management directs plan to be updated
March 2017 March 2017 - June 2017	Chelan Natural Hazards Mitigation Planning Committee Chairperson and Department of Emergency Management staff will begin 5-year plan update process; request a report of all mitigation activities and/or projects from all participating jurisdictions. Update plan in cooperation with Chelan Natural Hazards Mitigation Planning Committee Chairperson and others as may be necessary
July & August 2017	Conduct at least one public meeting regarding the plan update; receive comments from Planning Committee Members, stakeholders, and the public; make revisions as may be necessary
September 2017	Updated plan approved by all participating entities
September 2017	Submit updated plan to Washington State Hazard Mitigation Officer

Continued Public Involvement

All participating entities are dedicated to the continued involvement of the public in the natural hazards mitigation process.

Copies of the **Chelan County Multi-Jurisdiction Natural Hazard Mitigation Plan** will be kept and made available for public review at the following locations:

- Chelan County Department of Emergency Management
- Chelan County Natural Resource Department

- Chelan County Planning Department
- Chelan County Commission Chambers
- City of Cashmere City Hall
- City of Chelan Planning Department
- City of Entiat City Hall
- City of Leavenworth City Hall
- City of Wenatchee City Hall

A notice regarding the existence and location of these copies of the plan will be publicized annually during the month of September in the Wenatchee World, the local daily newspaper that serves Chelan County. The Chelan County Department of Emergency Management shall be responsible for receiving, tracking, and filing public comments regarding the plan. A public meeting will be held by the Chelan County Emergency Management Council as a part of the annual plan evaluation process as well as the five-year plan update. Additional meetings may also be held as deemed necessary by the Chelan County Emergency Management Council. The purpose of these meetings is to provide a public forum so that citizens can express concerns, opinions, or ideas about the plan.

Implementation Program

The Chelan County Emergency Management Council, through its participating members and authorities, will strive to implement the elements of the Chelan County Multi-Jurisdiction Natural Hazard Mitigation Plan and will be the coordinating organization that oversees implementation. Jurisdictions, districts and others have specific authorities to implement elements of the plan. Available funding will largely dictate implementation success. During annual plan evaluation the following measures will be reviewed to determine plan implementation status.

1. Integrate the goals and action items from the Chelan County Natural Hazard Mitigation Plan into existing regulatory documents and programs, where appropriate.

- Use the mitigation plan to develop elements of comprehensive land use plans under the Growth Management Plan, particularly elements designed to protect people and property from natural disasters and hazards through planning strategies that restrict development in areas of known hazards
- Integrate the county's mitigation plan into current capital improvement plans to ensure that development does not encroach on known hazard areas
- Partner with other organizations and agencies with similar goals to promote building codes that are more disaster resistant at the state level.

2. Establish a formal role for the Chelan County Natural Hazards Mitigation (staff) Committee to develop a sustainable process for implementing, monitoring, and evaluating countywide mitigation activities.

- Establish clear roles for participants, meeting regularly to pursue and evaluate implementation of mitigation strategies
- Oversee implementation of the mitigation plan
- Establish measurable standards to evaluate mitigation policies and programs and provide a mechanism to update and revise the mitigation plan
- Monitor hazard mitigation implementation by jurisdictions and participating organizations through surveys and other reporting methods
- Develop updates for the Mitigation Strategy based on new information
- Conduct a full review of the Mitigation Strategy annually by evaluating mitigation successes, failures, and areas that were not addressed
- Provide training for Committee members to remain current on developing issues in the natural hazard loss reduction field

3. Identify and pursue funding opportunities to develop and implement local and county mitigation activities.

- Develop incentives for local governments, special purpose districts, citizens, and businesses to pursue hazard mitigation projects
- Allocate county resources and assistance to mitigation projects when possible

- Partner with other organizations and agencies in Chelan County to identify grant programs and foundations that may support mitigation activities.

4. Develop public and private partnerships to foster natural hazard mitigation program coordination and collaboration in Chelan County.

- Identify all organizations within Chelan County that have programs or interests in natural hazards mitigation
- Involve private businesses and others throughout the county in mitigation planning
- Improve communication between entities with an interest in natural hazard mitigation planning

5. Develop inventories of at-risk buildings and infrastructure and prioritize mitigation projects

- Identify critical facilities at risk from natural hazards events
- Develop strategies to mitigate risk to these facilities, or to utilize alternative facilities should natural hazards events cause damages to the facilities in question.
- Identify bridges at risk from flood or earthquake hazards, identify enhancements, and implement projects needed to reduce the risks.

Funding

It is anticipated that the Chelan County Emergency Management Council will continue the evaluation, review, and implementation of the Chelan County Multi-jurisdiction Natural Hazard Mitigation Plan by using a combination of existing resources and future funding. To a large extent, the administrative responsibilities of key staff to perform these functions will be provided using existing resources from the County and Cities and is within the available budgets of these jurisdictions. In addition to staff resources, limited resources from the jurisdictions may be available for high priority actions and will be weighed against other statutory responsibilities of the jurisdictions. Chelan County is a rural and economically-depressed County and must focus resources on basic needs and services. High priority actions that are less than \$10,000 may be considered, although actions in excess of this amount will be primarily funded through state and federal grant programs.

Benefit-Cost Analysis Review

Benefit-cost analysis is a key mechanism used to evaluate natural hazard mitigation projects, although estimating the costs and benefits of a hazard mitigation strategy can be a complex process. In most cases, careful benefit-cost analysis requires the services of a specialist in this area; however, a general benefit-cost analysis can assist in evaluating hazard mitigation projects for possible implementation consideration. The Chelan County Multi-Jurisdiction Natural Hazard Mitigation Plan places a special emphasis on benefit cost review and uses a straightforward benefit cost formula to evaluate if mitigation actions identified in the plan should be undertaken from a benefit cost perspective. More detailed analysis of individual actions will be necessary when actions are being considered for actual implementation.

Why Evaluate Mitigation Actions?

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 natural hazard mitigation 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.

Benefit Cost Analysis

Benefit/cost analysis is used in natural hazard 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 (i.e., if net benefits exceed net costs, the project is worth pursuing). A project must have a benefit/cost ratio greater than 1 in order to be funded.

How can Benefit-Cost Analysis be conducted?

Benefit/cost analysis and cost-effectiveness analysis are important tools in evaluating whether or not to implement a mitigation activity. A framework for evaluating alternative mitigation activities is outlined below:

1. Identify the Alternatives

Alternatives 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 alternative. Potential economic criteria to evaluate alternatives include:

Estimate 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.

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.

How are Benefits of Mitigation Calculated?

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

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.

Benefit Cost Formula

Based on the above considerations, the Chelan County Multi-jurisdiction Natural Hazard Plan relies on the following benefit cost formula to review natural hazard mitigation strategies.

Benefit: Cost Factor = Ratio Score

Benefit = 3 for high, 2 for medium, 1 for low

Cost Factor = 1 for low, 2 for medium, 3 for high

Projects with a Ratio Score of at least 1 or greater are considered to be projects worth undertaking.

Benefits

- High (3): Action will result in a direct reduction of hazard risk to people and/or property from a hazard event
- Medium (2): Action will likely result in preventative measures being undertaken to reduce hazard risk in future events
- Low (1): Action will result in little direct or preventative measures being taken and will mostly alert community to oncoming hazard event

Cost Factors

- High (3): Action will require substantial amount of resources to complete and is beyond the means of local entities
- Medium (2): Action will require moderate amount of resources to complete and may be achievable with grant assistance or other supplemental funding
- Low (1): Action will require low amount of resources to complete and could be reasonably undertaken by local entities with minimal outside financial support

Individual benefit cost ratios have been completed for all potential mitigation actions and are included as part of the mitigation action descriptions in the Mitigation Strategy portion of the Plan. In general, the planning committee found that certain action types had similar benefits and cost factors. Additionally, projects of different magnitude often yielded identical benefit cost priorities. The table below explains these trends.

<i>Mitigation action type</i>	<i>Benefit</i>	<i>Cost Factor</i>	<i>Priority</i>
Projects	High (3)	High (3)	1
Planning and Inventories	Medium (2)	Medium (2)	1
Policy and Programs	Medium (2)	Low (1)	2
Education	Medium (2)	Low (1)	2
Mapping	Medium (2)	Low (1)	2
Communication Systems	Low (1)	Low (1)	1

Section II: Natural Hazard Risk Assessments

Overview

The following eight (8) natural hazards have been identified within Chelan County based simply on historic occurrence, future development patterns and/or proximity to hazard. Significant events since 2004 have been included in individual sections for this 2010 update.

1. **Flooding:** Chelan County is distinguished by mountainous terrain and narrow river valley bottoms that contain much of the developable land base. 15% of Chelan County is in private ownership, largely within these river valleys, while approximately 85% of the County's remaining land base is mountainous terrain managed by the United States Forest Service.
2. **Earthquake:** The mountainous terrain and geologic instability of the region result in frequent minor earthquakes and occasional events that cause property damage.
3. **Severe Storms:** The area is marked by four traditional seasons, with summer and winter weather exhibiting sometimes extreme conditions. Long periods of cold weather and snow in the winter and extended periods of 100 degrees + in summer are not uncommon.
4. **Volcano:** While no recent volcanic hazard events have occurred, the area is located close to several inactive volcanoes.
5. **Landslide:** A combination of severe storms, steep slopes and unstable geography results in occasional landslides.
6. **Drought:** Extreme summer heat and markedly low precipitation in the lowlands, where most of the agricultural and residential development occur, result in occasional drought conditions and declarations.
7. **Wildfire:** Extreme summer conditions combined with historic and present timber management practices have resulted in large-scale wildfires, including areas at the urban wildland interface.
8. **Avalanche:** Winter snow accumulations, temperature variations (freeze-thaw cycle), and steep slopes result in occasional avalanches in the area, although development is typically not located in these areas.

These eight (8) hazards have been addressed in the Risk Assessment according to the following categories:

Definition and types: Description of natural hazard and different types, if applicable

Location and extent: Areas where natural hazards have occurred and may occur in the future, including their severity.

Occurrence: Historical record of past natural hazard events

Vulnerability: Areas subject to potential disaster from natural hazards

Probability of recurrence: Potential for natural hazard to occur in the future, based on High, Medium, and Low, where High = Probable and likely in the near future (within 5 years); Medium = Possible in the near future (5 to 15 years); Low = Not likely to occur (longer than 15 years).

Flooding¹

Definition

Flooding is defined as a significant rise in water level due to increased surface water run-off or groundwater saturation that results in an increase in surface water levels beyond what is typically expected and that can cause damage to man-made structures.

Types

The two types of flooding common in Chelan County are stage and flash flooding. Stage flooding occurs during periods of heavy rains, especially upon existing snow packs (“rain-on-snow” events) during early winter and late spring. Stage flooding can last several days after the storm. Flash floods are more likely to occur during the summer months during thunderstorm season and are usually associated with cloudburst-type rainstorms and/or ice or debris dams.

Location and Extent

Flooding is one of the most common natural hazards in Chelan County. Steep drainage areas and populated low-lying areas typical of the County present a geography that will continually be subject to flooding problems. Historically, Chelan County has had regular occurrences of flash flooding. Due to the County's topography and climate, stage and flash flooding will continue to be a threat in most parts of the county.

The Columbia River, Wenatchee River, Entiat River, Stehekin River and other perennial streams in Chelan County follow an annual cycle with peak streamflow in April and May and low streamflow in August and September. Normally, streamflow in many of the smaller drainages are intermittent seasonally, while drainages in lower elevations are often dry. Hazardous areas found along stream courses for most types of residential or recreational development include those areas within the floodplain (100-year flood event) and floodway (10-year flood event) boundaries. Present problem areas for flash flooding include Slide Ridge in the Chelan area and No. 1 and No. 2 Canyons in the Wenatchee area. Stage flooding problem areas are in the area where the Icicle and Wenatchee Rivers meet in Leavenworth, the head waters of the Wenatchee River and the confluence area of the Wenatchee River.

The primary cause of flash flooding which can occur in any drainage area in the county is high intensity rainfall. Although infrequent, and usually of short duration, high intensity rain fall has been seen in all seasons in the past and particularly in July and August.

The threat of flash flooding is increased in an area that has suffered from a major wildland fire. Not only is there a greater amount of loose debris, most of the ground cover has been burnt away. Without ground cover more soil and debris will be allowed to flow, increasing the chance of debris dams. Major wildland fires have occurred recently in Chelan County, and flash floods and mud flows have occurred following these events.

¹ Historical information, repetitive loss properties and NFIP participation obtained from WA Department of Ecology, Flood Management Division

Depending upon the characteristics of a particular watershed, peak flows may be reached from less than one hour to several hours after rain begins. The debris dams and mudslides accompanying rapid runoff conditions make narrow canyons and alluvial fans at the mouth of the canyons extremely hazardous areas.

Primary flood season in Chelan County occurs during the spring snowmelt (March to June) and again November to February when rain-on-snow events have produced historic floods.

Windstorm season is typically October through March, and snow season runs October through March, although higher elevations will see snow ten months of the year.

Occurrences

Stage flooding events have been more common in the past 15 years in Chelan County, with the last two episodes occurring in 1990 and 1995. Both events well exceeded 100-year flood events. These floods have caused extensive damage along the Wenatchee and Icicle River drainages; however, no fatalities have occurred as a result of stage flooding in Chelan County. In October 2003, substantial flooding occurred in the Stehekin River, destroying public and private property and infrastructure, and Chelan County is currently seeking federal assistance to address flood impacts in this area.

Stage Flood Events

May/June 1948: Snowmelt flooding broke lake and river records Countywide

May/June 1972: Snowmelt flooding combined with heavy rains affected rivers Countywide, particularly the Entiat River

November 1990: Severe storms and flooding occurred during Veteran's Day and Thanksgiving weekend Countywide, particularly the Wenatchee River

November/December 1995: Extensive rains caused flood stage records Countywide, particularly in the Wenatchee River

December 1996/January 1997: Saturated ground combined with snow, freezing rain, rain, rapid warming and high winds within a five-day period to cause flooding.

October 2003: Rain-on-snow event in upper Cascades caused flood-of-record in Stehekin River.

May 2006: Rapid spring thaw caused flooding in Entiat River, Chatter Creek and Icicle River.

November 2006: Rain-on-snow event caused extensive flooding in Stehekin River and limited flooding in Icicle Creek.

January 2009: Rain-on-snow event caused limited flooding in Mad River, Mill Creek and Icicle Creek (particularly in the Leavenworth area)

Flash flooding has caused deaths in the area and is a threat to local populated areas due to the topographical make up of the County. For example, the City of Wenatchee, with a population

nearing 30,000 is located on an alluvial fan below the mouths of three canyons (No. 1, No. 2 and Dry Gulch). Severe thunderstorm or rapid snowmelt poses a constant threat of extensive damage and death.

The following flash flood events have resulted in fatalities:

YEAR	LOCATION	FATALITIES
1925	Squilchuck Creek	14
1942	Tenas Gorge	8
1948	Pine Canyon (Douglas County)	1
1972	Preston Creek/Entiat River	4

No. 1 Canyon, No. 2 Canyon and Dry Gulch are each located on the western edge of the City of Wenatchee. These drainages are largely undeveloped and remain vegetated with native plant species. Development has occurred along the eastern fringes where the canyons discharge runoff into the City. These interface zones have experience flooding problems in recent years due to a lack of defined drainage channels as they flow from the County through the City and where they ultimately are discharged into the Columbia River. Outside of those areas immediately adjacent to the City, conveyance systems within the county predominately consists of open ditches and culverts.

In 2012, Chelan County will adopt the Greater Wenatchee Area Stormwater Comprehensive Plan. The objective of the Comprehensive Plan is to identify and prioritize projects for the county and to address conveyance deficiencies, water quality elements, and proposed improvements to minimize system deficiencies in the major stormwater systems within the Study area, including but not limited to, No. 1 and No. 2 Canyons, and Dry Gulch.

Vulnerability

Floods have caused loss of life, personal injuries and damage to property, along with damage to roads, bridges, utility systems, etc., in Chelan County. Secondary events from major flooding by polluted water include the spread of disease and contamination. This increases the health risk for those people returning to homes in areas that had been flooded. Due to the geography of Chelan County, many residents must locate their homes, businesses and other infrastructure near or within the 100-year and 500-year floodplain. While there are few repetitive loss properties within the County, particularly with respect to critical infrastructure, continued development in flood-prone areas may result in significant losses due to flooding. National Park Service (North Cascades) notes occurrence of large flood events in fall rather than spring over the last 100 years may be due to climate change.

The map on the next page shows the 500-year flood areas within Chelan County. More detailed information on the 100-year floodplain areas can be found on FEMA FIRM maps in the Chelan County Building Department.

National Flood Insurance Program (NFIP)

There are a small number of structures within Chelan County that are repetitively damaged by floods. These properties are also known as Repetitive Loss (RL) properties. The RL properties are scattered throughout the County and not concentrated in any one particular area. While the cities within Chelan County are NFIP participants, there are no RL properties within these jurisdictions. The following information addresses changes in 44 CFR 201.6 for the Chelan County Multi-Jurisdiction Natural Hazard Mitigation Plan.

Repetitive Loss Properties

There are 6 RL properties in Chelan County that have had 11 losses (there may have been more but the 6 are the ones listed by FEMA as not having been mitigated, i.e., if there are others, they were mitigated and are no longer RL properties).

- Single-family residence in Monitor area (lower Wenatchee River). Losses occurred 11/27/95 and 11/22/90. Total losses for both floods were just over \$29,600 for the building.
- Single-family residence near Chelan. Losses occurred 12/1/95 and 11/25/90. Total losses for both floods were just over \$23,725 for the building.
- Single-family residence near Lake Wenatchee (Nason Creek). Losses occurred 11/30/95 and 11/24/90. Total losses for both floods were about \$59,700 for building and \$3,290 for contents.
- Nonresidential structure near Cashmere. Losses occurred 2/9/96 and 5/28/93. Total losses for both floods were about \$32,270 for building and \$56,300 for contents.
- Single-family residence near Leavenworth (Icicle Creek). Losses occurred 11/11/06, 5/18/06 and 11/29/95. Total losses for the 3 floods were about \$22,400 for building and \$35,560 for contents.
- Single-family residence in Stehekin. Losses occurred 5/15/200, 7/16/99, 6/10/97 and 6/11/96. Total losses for the 4 floods were about \$40,844 for building and \$9,142 for contents.

Severe Repetitive Loss Properties. There are no severe repetitive loss properties in Chelan County.

Insurance Summary (valid as of February 1, 2010)

- There are currently 374 flood insurance policies in unincorporated Chelan County, 800 including cities (there are 322 in Wenatchee).
- Of the 374, 188 are written for properties in the floodplain (50%) and 186 are written for properties outside of the floodplain. Of the 800, 579 are written for properties in the floodplain (72%) and 221 are for properties outside the floodplain (28%).
- Of the 374 policies in unincorporated Chelan County, 366 are residential and 8 are nonresidential.

- The total annual premium in unincorporated Chelan County is \$200,597; average premium is \$536. For the 800 policies, the total premium is \$434,122; average premium is \$543.
- Total coverage in unincorporated Chelan County is \$84,463,100; average coverage is \$225,837. For the entire County, total coverage is \$160,570,300; average coverage is \$200,713.
- There have been 98 claims in unincorporated Chelan County for \$975,190 in claims payments. The average claim is \$9,951; however, only 74 of the 98 claims were paid, so the average paid claim is \$13,178.
- Of the 98 claims, 6 were for substantial damage losses.
- Total claims for Chelan County and cities are 116 for \$1,070,167 in claims payments; average claim is \$9,226. However, only 78 of the 116 were paid claims, so the average paid claim is \$13,720.

Structures exposed to flood risk. According to County records (Biennial Report to FEMA), 1,125 people in 437 residences are in the Special Flood Hazard Areas (this is about 4% of the population). The County lists no nonresidential buildings in the Special Flood Hazard Areas.

Areas with limited insurance coverage. A casual perusal of insurance policy information is inconclusive. There are probably enclaves along the Wenatchee River that could benefit with greater coverage, but these areas are spotty and hard to define. 4% of the County's residences do carry flood insurance.

Compliance history. Currently the County is in good standing with the NFIP. There are no outstanding compliance issues; however, the last CAV in Chelan County was on March 27, 2003, and another CAV is needed. It is scheduled to be conducted in either 2010 or 2011.

Staff Resources

Chelan County's Building Official, a position within the Department of Community Development, serves as the Floodplain Manager. Duties related to floodplain development and NFIP compliance is auxiliary to the main responsibilities as Building Official. The County does not have a Certified Floodplain Manager on staff. NFIP administration services performed by the Building Official include permit review and inspections. Engineering capability and flood elevation certifications are performed by outside surveyors and contractors. There are no barriers within the County to running an effective NFIP program.

Regulation

- Chelan County established eligibility in the NFIP's Emergency Program on October 30, 1974 after receiving its Flood Hazard Boundary Map on February 1, 1974. The County's first Flood Insurance Rate Maps were issued on February 4, 1981, which is also the date the County was converted to the NFIP's Regular Program.

- FIRMs for Chelan County were updated on June 5, 1989, July 2, 2002 and September 30, 2004. FIRMs are paper maps; there has been no DFIRM for Chelan County.
- Chelan County's Flood Chapter 3.20 is fully compliant with NFIP and State floodplain management regulations. This chapter exceeds the FEMA and State requirements in the following ways:
 - New residences in the floodplain must be elevated **3 feet above the Base Flood Elevation (BFE)**; nonresidential buildings must be one foot above the BFE.
 - No fill, grading or excavation that unduly affects the efficiency or capacity of the channel or floodway, or decreases flood storage, is permitted. Fills must be protected against erosion.
 - Critical facilities must be located outside the floodplain to the extent possible, or must be elevated at least three feet above the BFE.
 - Where BFE data has not been provided by FEMA, applicants must develop such data for subdivision proposals and other proposed developments (exceeds FEMA's 50 lot-5 acre criteria).

Community Rating System. Chelan County does not participate in CRS (neither do any of the cities or towns in Chelan County); only 31 of the 293 NFIP communities in Washington participate in CRS.

Flood Risk Maps. The Department of Ecology has identified the need for revised study on the Upper Wenatchee River for approximately 15 miles downstream of Lake Wenatchee. The Wenatchee River from Leavenworth to the River's confluence with the Columbia in Wenatchee has been re-studied using new hydrology, but the Upper Wenatchee has not been restudied. Ecology has also noted the need to mesh flood mapping in the Wenatchee area to a consistent scale, and to convert the FIRMs for Chelan County to the DFIRM and countywide format. If the County has LiDAR information, that can be included in future flood map updates. Also, the recent modeling work done on the Stehekin River (2009) can be included in future map work.

Probability of recurrence: High

Please see individual jurisdictions for a detailed description of vulnerability and priority measures to address this hazard.

Earthquake²

Definition

An earthquake is the sudden release of stored geologic energy along the fault line of tectonic plates or weak areas where plates contact each other.

Types

As a result of the location of Washington at the convergence location of two tectonic plates, many areas within the State are subject to a variety of earthquake types: intraplate, colliding, and overriding plate quakes. Chelan County is typically subject to shallow crustal earthquakes typical of overriding plate types.

Earthquakes can range in intensity from slight tremors to great shocks and may last from a few seconds to as long as five minutes. After the initial shock, additional shocks (aftershocks) may occur over a period of several days. Depending upon the magnitude of a given earthquake, the primary effect of actual ground movement may include fatalities and/or injuries from collapsed buildings, bridges, dams or other structures, landslides or avalanches severing transportation routes, disruption or failure of electric, telephone, gas, water, sewer and other essential utilities.

Secondary effects in an earthquake damaged area can include fires from ruptured gas mains or downed power lines, contamination or lack of water from ruptured water and sewer lines, hampered rescue efforts due to damaged equipment or roads, and the risk of aftershocks creating more damage.

Location and Extent

Although earthquakes are unpredictable and can occur anywhere at any time, historical and scientific data suggest there are some areas within Chelan County with a higher risk potential for future seismic activity. These higher risk areas include Lake Chelan and vicinity and the Entiat area. Historically, the Lake Chelan area is the most active earthquake area in Chelan County. Since the turn of the century, over 23 earthquakes have occurred in the Lake Chelan area. From 1901, 17 earthquakes have occurred in the Entiat area. Earthquakes have occurred sporadically throughout the rest of Chelan County, the latest occurring north of the Entiat area in 1995.

It should be noted that Chelan County is in the "Back-Arc" region and that earthquakes in this region have a shallower epicenter than on the west side of the Cascades. Seismic activity in Eastern Washington occurs at depths less than 8 km. The shallow depths produce more aftershocks than deeper quakes.

Occurrences

Earthquakes in Eastern Washington have been generally small in magnitude, but much shallower in depth. These shallow, moderate magnitude earthquakes often cause considerable damage in the immediate vicinity of the earthquake (Noson, 1985).

From the early 1900's to the present, over 130 earthquakes have been recorded in North Central Washington. A majority of the seismic activity in Chelan County has been recorded at

² Washington State Hazard Risk Assessment

earthquake epicenters near Lake Chelan, Chelan Falls, Entiat and Wenatchee. Magnitudes of these earthquakes have ranged in intensity from 3 to 6 on the Richter Scale. Damage by earthquakes has been low in the County.

What may have been the largest earthquake in the history of the Pacific Northwest occurred on December 14, 1872 in Chelan County. Due to poor record keeping in a predominately frontier area, scientists have been unable to determine an exact intensity for that incident. However, general consensus indicates a range of 7 - 8 on the Richter Scale was not unlikely. Most scientists agree that the epicenter of this earthquake was located in the Northern Cascades, Okanogan area within a zone extending from Lake Chelan in the south to Southern British Columbia in the north (Coombs, 1979). This earthquake was felt from British Columbia to Oregon and from the Pacific Ocean to Montana. It occurred in a wilderness area, which in 1872 had only a few inhabitants – local Indian tribes, trappers, traders, and military men. Because there were few man-made structures in the epicenter area near Lake Chelan, most of the information available is about ground effects, including huge landslides, massive fissures in the ground, and a 27-foot high geyser.

Extensive landslides occurred in the slide-prone shorelines of the Columbia River. One massive slide, at Ribbon Cliff between Entiat and Winesap, blocked the Columbia River for several hours. A field reconnaissance to the Ribbon Cliff landslide area in August 1976 showed remnants of a large landslide mass along the west edge of Lake Entiat (Columbia River Reservoir), below Ribbon Cliffs and about 3 kilometers north of Entiat. Although the most spectacular landslides occurred in the Chelan-Wenatchee area, slides occurred throughout the Cascade Mountains.

Most of the ground fissures occurred in the following areas: at the east end of Lake Chelan in the area of the Indian camp; in the Chelan Landing-Chelan Falls area; on a mountain about 12 miles west of the Indian camp area; on the east side of the Columbia River (where three springs formed); and near the top of a ridge on a hogback on the east side of the Columbia River. These fissures formed in several locations. Slope failure, settlements, or slumping in water-saturated soils may have produced the fissures in areas on steep slopes or near bodies of water. Sulfurous water was emitted from the large fissures that formed in the Indian camp area. At Chelan Falls, "a great hole opened in the earth" from which water spouted as much as 27 feet in the air. The geyser activity continued for several days, and, after diminishing, left permanent springs.

In the area of the epicenter, the quake damaged one log building near the mouth of the Wenatchee River. Ground shaking threw people to the floor, waves observed in the ground, and loud detonations heard. About two miles above the Ribbon Cliff slide area, the logs on another cabin caved in.

Vulnerability

For the North Central Washington area, stress profiles obtained for a Washington Public Power Supply System (WPPSS) earthquake study in 1979 based on regional gravity data identify the Chelan area as a high potential earthquake epicenter zone.

In October of 1979, WPPSS completed an earthquake study prior to construction of Washington nuclear power plants one and four. Parts of this study focused on identifying geologic faults

found in that portion of the Cascades within Chelan County. Although presumed inactive, major faults were located at Leavenworth and Entiat Valley areas. Somewhat more active and shorter fault zones of approximately 30 km long merge into these larger faults. They are the Chumstick fault and Eagle Creek fault. An additional major fault is located in the upper Naneum Creek. However, the study concludes recent seismic activity in Chelan County has not been associated with these major faults.

Another type of stress zone which is highly correlated to earthquake epicenters is located in the Lake Chelan area. Seismic activity in this area is related to the compression of the land mass by the weight of the water in the lake. The 1979 WPPSS study found this type of stress has a greater risk for earthquake potential than the inactive fault zones found in other areas of the County.

Earthquakes can occur anywhere, at anytime and without warning. Because a majority of earthquakes are not associated with known faults, they are also very unpredictable. Past geological studies indicate areas prone to earthquakes may experience long periods of inactivity. These areas may be building tension which can lead to a major earthquake.

Due to the unpredictability of earthquakes, forecasting when or where the next one will occur in Chelan County is impossible. Although past earthquakes have been in the form of milder tremors, the potential for a major earthquake cannot be ruled out. The probability that an earthquake will occur in Chelan County is high. The question of when, where and of what magnitude remains to be seen.

In addition to the geologic vulnerability, socioeconomic factors in Chelan County indicate a vulnerable population in the event of a major earthquake incident. Chelan and Yakima Counties rank highly Statewide in the socioeconomic factors that would challenge emergency responders during an event.

The map on the next page shows the geologic fault lines within Chelan County.

Probability of recurrence: Medium

Please see individual jurisdictions for a detailed description of vulnerability and priority measures to address this hazard.

Severe Storms³

Definition

A severe storm is an atmospheric disturbance that results in one or more of the following phenomena: strong winds and large hail, thunderstorms, tornados, rain, snow, or other mixed precipitation. Typically, major impacts from a severe storm are to transportation and loss of utilities.

Types

For the purposes of the Chelan County Severe Storms profile, the following severe storm elements are considered:

- High winds – Storms with sustained winds of 40 mph or gusts of 58 mph or greater, not caused by thunderstorms, expected to last for an hour or more. The National Weather Service classifies wind from 38 to 55 MPH as **gale force winds**; 56 to 74 MPH as **storm force winds** and any winds over 75 MPH as **hurricane force winds**. Destructive winds like those described normally occur between October and March.
- Severe Thunderstorm – Storms that produce winds of 58 mph or greater, or three-quarter inch or larger hail.
- Winter storm – A storm with significant snowfall, ice, and/or freezing rain; the quantity of precipitation varies by elevation. Heavy snowfall is 4 inches or more in a 12-hour period, or 6 or more inches in a 24-hour period in non-mountainous areas; and 12 inches or more in a 12-hour period or 18 inches or more in a 24-hour period in mountainous areas.

Location and Extent

Chelan County is subject to a number of severe storm conditions such as thunder, lightning, wind, snow, ice and hail. Since severe weather disturbances often represent the extremes in wind, cold, precipitation or other weather phenomena, direct damage to the natural and built environment have occurred statewide.

Depending upon the time of year, additional hazards resulting from a severe storm can include wildfires, flashfloods, avalanches or landslides. Severe thunder, hail, wind and winter storms are common in all parts of Chelan County. The climate possesses both continental and marine characteristics, with the Cascades serving as a topographic and climatic barrier. Air warms and dries as it descends along the eastern slopes of the Cascades, resulting in shrub-steppe conditions in the lower elevations of Chelan County. In the driest areas, rainfall occurs about 70 days each year in the lowland and about 120 days in the higher elevations near the eastern border and along

³ Washington State Risk Assessment and Chelan County Hazard Inventory and Vulnerability Assessment

the eastern slopes of the Cascades. Annual precipitation ranges from seven to nine inches near the confluence of the Snake and Columbia Rivers in the Tri-Cities area, 15 to 30 inches along the eastern border and 75 to 90 inches near the summit of the Cascade Mountains.

During July and August, four to eight weeks can pass with only a few scattered showers. Thunderstorms, most as isolated cells, occur on one to three days each month from April through September. A few damaging hailstorms are reported each summer. Summers are warmer, winters are colder, and precipitation is less than in western Washington. Extremes in both summer and winter temperatures generally occur when air from the continent influences the inland basin. During the coldest months, freezing drizzle occasionally occurs, as does a Chinook wind that produces a rapid rise in temperature.

During most of the year, the prevailing wind is from the southwest or west. The frequency of northeasterly winds is greatest in the fall and winter. Wind velocities ranging from four to 12 mph can be expected 60 to 70 percent of the time; 13 to 24 mph, 15 to 24 percent of the time; and 25 mph or higher, one to two percent of the time. The highest wind velocities are from the southwest or west and are frequently associated with rapidly moving weather systems. Extreme wind velocities can be expected to reach 50 mph at least once in two years; 60 to 70 mph once in 50 years; and 80 mph once in 100 years.

Severe local storms occur when the interior of British Columbia is under the influence of high barometric pressure, and a deep low pressure center from over the Pacific approaches the Washington coast. At this latitude, severe storms normally approach Chelan County from the south or southeast. Although the intensity of major storms has often been reduced by the Cascades, winds over exposed peaks can reach 100 MPH or greater, with peak gust of 125 - 150 MPH as the storm moves inland.

Primary flood season in Chelan County occurs during the spring snowmelt (March to June) and again November to February when rain-on-snow events have produced historic floods. Windstorm season is typically October through March, and snow season runs October through March, although higher elevations will see snow ten months of the year.

Chelan County Severe Storm Hazards identified in Washington Hazard Assessment

	Vulnerable due to meteorological conditions	Recurrence Criteria	Meets Recurrence Criteria
High Wind	Yes	100%	No
Winter Storm	Yes	>50%	
Blizzard	No	>2.5%	No
Dust Storm	No	>2.5%	No
Severe Thunderstorm	Yes	>20%	Yes (30%)
Tornado	No	>5%	No

Coastal	No	>2.5%	No
---------	----	-------	----

Occurrences

Historically, Chelan County has had a number of severe storms over the years. While not all of these have caused major long-term problems, they all have disrupted people's day-to-day activities and posed a burden, especially on the poor and elderly. Table 4.3-1 of lists some of the notable severe storms in Chelan County.

Table 4.3-1 Notable Recent Severe Storms In Chelan County

DATE	TYPE	DESCRIPTION
January 1950	Snow	Eastern Washington received up to 50 inches of snow
October 1950	Wind	Entire state, Max. velocity 57 - 60 MPH
March 1956	Wind	Entire state, Max. velocity 48 - 60 MPH
December 1968	Snow	Chelan Co. extensive snowfall
March 1972	Rain	Wenatchee area record rainfall for 24 hour period. Flash flood on 1970 burn
June 1972	Hail	Wenatchee area, extensive soft fruit damage
August 1979	Thunder	Entiat & Chelan area, ignited largest wildfires in the nation for 1970's
January 1983	Wind	Wenatchee area, peak gusts 52+ MPH
March 1988	Wind	Entire county, unofficial gust 100+ in the Manson and Wenatchee areas.
January 1996	Snow	Several structures damaged due to snow loads
January 1997	Snow	Passes closed two days due to heavy snow and avalanche danger.
December 2006	Wind	Widespread power outage in Lake Wenatchee and Entiat Valley
January 2007	Snow	Power outages Countywide

Vulnerability

Chelan County has been vulnerable to severe winter storms when significant snowfall has immobilized local and state transportation routes as well as utility systems. All areas of the County have been subject to these events, which appear to occur at least once every five to ten years. Primary effects normally vary with the intensity of the storm. In some cases transportation accidents can occur from accumulation of snow, ice, hail or dust from accompanying winds. Physical damage to facilities can occur from accumulation of snow, ice, hail or dust and from accompanying winds. Other primary effects may include loss of life and injury from accompanying flashfloods, fires or avalanches.

Secondary effects can include severe wind erosion of dry soils, overtaxing of electric utilities during severe weather conditions, crop damages or loss from hail, agricultural damages created from inflated prices and finally temporary shortages of necessities in the storm impacted area.

Historically, Chelan County has been subject to many types of storms. These have varied in intensity from mild to severe. Common types of storms in this area include thunder, hail, wind and winter related blizzards, etc.

All areas of Chelan County are vulnerable to the threat of severe storms. Due to topography and climatological conditions, the higher mountainous areas are often the most exposed to the effects of these storms. Normally the mountainous terrain and the north/south orientation of the Cascades tend to isolate severe storms into localized areas of the County, although individual storms can generate the force to impact the entire County at one time. High wind events can occur as a result of the mountainous terrain in the County.

The map on the following shows the severe snow storm potential in Chelan County and is based partly on snowload capacities used by the Chelan County Building Department

Probability of recurrence: High

Please see individual jurisdictions for a detailed description of vulnerability and priority measures to address this hazard.

Volcanic Hazard⁴

Definition

A volcano is a vent in the earth's crust through which magma, rock fragments, gases, and ash are ejected from the earth's interior. Over time, accumulation of these erupted products on the earth's surface creates a volcanic mountain.

Types

There are no volcanoes located in Chelan County. See below for further explanation.

Location and Extent

There are no active or dormant major volcanoes located in or near Chelan County that present a direct threat to its citizens, although the Cascade Mountain range contains hundreds of extinct volcanoes. Volcanoes are considered active if they have erupted within recent historical time, or are showing present signs of activity. Accordingly, Mt. Baker, Mt. St. Helens, Mt. Rainier and Glacier peak are all considered active. Dormant volcanoes are those that have not shown signs of erupting within the last 10,000 years. Mt. Adams is considered dormant, but it is capable of renewed activity. Both the active and dormant volcanoes of Washington are of the composite category.

Occurrences

All of the active and dormant volcanoes in the State indicate the presence of heat and on occasion emit steam and hydrogen sulfide gas. Mt. St. Helens is the most active of the volcanoes in the State. Studies indicate that it may have been active every few hundred years for centuries with the most recent series of eruptions occurring in the early 1980's to present.

Past studies of Mt. Rainier and Mt. Baker outlined in the Washington State Hazard Analysis indicate their latest eruption activity may have occurred in the early and mid 1800's. Glacier Peak, which is located closest to Chelan County, may have erupted as recently as the 17th century. Many geologists feel there is a possibility that these volcanoes will erupt again.

Vulnerability

Volcanic hazards to Chelan County are low to non-existent, and in the event of volcanic activity from the likely volcanoes, the impacts to Chelan County would be most likely be minimal. Since volcanoes usually provide some warning prior to an eruption, there is normally time to prepare, warn and inform the public. The degree of hazard depends on the kind of eruption and proximity to the eruptive vent. Most of the dangers are to people in the near vicinity of the volcano. As demonstrated by the 1980 eruption of Mt. St. Helens, the primary effects in Chelan County are more likely to result from ash fallout. Depending upon the severity of the eruption and the areas of the downwind plume, these effects may include immobilization of transportation; telephone communication short circuits; power failures; and respiratory or other health problems. Secondary problems include economic cost for cleanup, ash disposal problems and structural failures due to the density of ash, where one inch of ash weighs ten pounds to the square foot.

⁴ Washington State Hazard Risk Assessment

Glacier Peak is located a few miles northwest of the County. This volcano was formerly thought to be inactive, but recent studies have shown steam issues from its flanks. This mountain is also the site of three hot springs which indicates there is heat somewhere within it. Scientists have only recently indicated that this volcano has potential for eruption.

Because of the distance from the State's active volcanoes to Chelan County, the largest potential threat is volcanic ash. Thus, the effects of volcanic activity upon Chelan County depend on the locations of the volcano and the prevailing wind direction. Under certain conditions, heavy ash fallout in Chelan County would have the same effects as the 1980 Mt. St. Helens ashfall in adjacent Eastern Washington counties.

The map on the following page demonstrates Chelan County's proximity to the major volcanoes in Washington State.

Probability of recurrence: Low

Please see individual jurisdictions for a detailed description of vulnerability and priority measures to address this hazard.

Landslide⁵

Definition

A landslide is the movement of material down steep slopes, including snow, rocks, mud and other earthen materials.

Types

Landslides of rock, mud and other earthen materials can range in size from thin masses of soil a few yards wide, to deep-seated bedrock slides greater than six miles across. Travel rates may range in velocity from a few inches per month to many feet per second. Old slide areas and slumps can be reactivated by earthquakes or unusually wet winters. These areas are also more susceptible to construction triggered sliding than adjacent undisturbed material.

While gravity is the primary reason for a landslide, there can be other contributing factors.

- The local topography, or the shape, size and degree of a slope and its drainage.
- Erosion by rivers, glaciers, or ocean waves that create over-steepened slopes.
- Saturation, by snowmelt or heavy rains, that weaken rock or soils on slopes.
- Earthquakes create stress that cause weak slopes to fail. Earthquakes of magnitude 4.0 and greater can trigger landslides.
- Volcanic eruptions that produce loose ash deposits and debris flows.
- Excess weight, from accumulation of rain or snow, from stockpiling of rock or ore, from waste piles, or from manmade structures, may stress weak slopes to failure.
- Human action, such as construction, logging or road building that disturbs soils and slopes.

Location and Extent

Landslides are relatively uncommon in Chelan County despite the fact that over 85% of the County is within steeply-sloped areas of the Cascade Range Landslide Province as identified in the Washington State Hazard Assessment (Draft). Much of the underlying earthen material is bedrock and therefore less susceptible to landslides. Snow landslides, or avalanches, are more common and addressed in the Avalanche Risk Assessment Section.

Areas vulnerable to landslides are identified largely by steep slope classifications, soil types, conditions of bedrock materials and water content or unstable soils. Recognition of hazardous conditions and identification of historically prone landslide areas are especially important for future land use development planning. Often man-made structures, both public and private, are constructed on top of or below bluffs and slopes which are subject to land sliding. Additional development is occurring on alluvial plains and at the mouths of narrow restricted canyons. Other areas subject to landslides are the mountain pass highway routes and areas located below watersheds which have been devegetated in wildfires or heavily logged.

⁵ Washington State Hazard Risk Assessment and Chelan County Hazard Inventory and Vulnerability Assessment

Occurrences

Some damaging slides have occurred in and near to Chelan County. On December 14, 1872, a slide triggered by an earthquake caused a massive rock slide, which cut off the flow of the Columbia River. This slide occurred a few miles north of the present location of the town of Entiat. This event is detailed more thoroughly in the Earthquake Risk Assessment Section.

A handful of small-scale landslides have occurred in Chelan County over the years, usually the result of significant precipitation. Two significant landslides occurred between 2004 and 2010. In January 2007, a landslide occurred at Dirty Face Mountain and closed the Lake Wenatchee Highway temporarily. In February 2008, a landslide destroyed one (1) home in the Kahler Glen development at Lake Wenatchee. Some landslide events have resulted in fatalities, as noted below.

Landslide Deaths in Chelan County

Year	Location	Type	Fatalities
1942	Tenas George	Mud	8
1965	Leavenworth	Mud	1
1973	Preston Creek	Mud	4
1995	SR 97A	Rock	2

Vulnerability

Landslides occur in Chelan County though are not one of the County's top natural hazard threats. Landslides are the cumulative result of a series of events. Slides often occur on steep slopes after severe storms, wildfires, earthquakes or construction activity in slide prone areas. Because of the steep topography and narrow valleys of Chelan County, the potential for slides is high all year round. Under the right conditions any steep sloped area of Chelan County may be classified as a potential hazard area.

The ever-increasing pressure for development in or near the mountains and narrow valleys bring added exposure to people and their structures. Increasingly, more and more people are recreating, working and building in potentially hazardous areas with little caution or preparation. Development pressure in rural areas and at recreation sites in the mountains brings added exposure to people and their structures. Slide effects on individual or public organizations include partial damages or destruction of significant portions of highways and railroads, utility lines, private and public property. Other major effects involve the loss of natural resources and the cost of debris removal.

The map on the following page shows the landslide hazards in major populated areas by illustrating unstable soils and unstable soils combined with steep slopes.

Probability of recurrence: Medium

Please see individual jurisdictions for a detailed description of vulnerability and priority measures to address this hazard.

Drought⁶

Definition

A drought is a prolonged period of dryness severe enough to reduce soil moisture, water and snow levels below the minimum necessary for sustaining plant, animal, and economic systems. Washington State has a statutory definition of drought. According to state law, an area is in a drought condition when (1) the water supply for the area is below 75 percent of normal and (2) water uses and users in the area will likely incur undue hardships because of the water shortage. (RCW 43.83B.400)

Types

Drought condition types in Chelan County can be described by their potential impacts and by using the National Drought Mitigation Center at the University of Nebraska-Lincoln categories.

- Agricultural – Drought threatens crops that rely on natural precipitation.
- Water supply – Drought threatens supplies of water for irrigated crops and for communities.
- Fire hazard – Drought increases the threat of wildfires from dry conditions in forest and rangelands.

Additionally, drought conditions can affect hydropower production capacity, and significant hydropower facilities exist in Chelan County, notably Rocky Reach and Rock Island Dams owned by the Chelan County Public Utility District #1.

Location and Extent

All areas of Chelan County are vulnerable to drought conditions. Although not subject to severe annual precipitation deficiencies, periodically Chelan County experiences seasonal dry spells lasting two to three months; however, since the early 1920's there have been approximately 13 droughts statewide which have particularly impacted Chelan County. During these low water years, agriculture, forestry and hydroelectric interests have been impacted, particularly non-irrigated farm, range and forest land uses.

Occurrences

In the State of Washington there have been 19 drought occurrences since 1901. These dry spells have typically lasted for a period of 1 to 2 months to a period of 2 years.

According to the National Drought Mitigation Center at the University of Nebraska-Lincoln, the Pacific Northwest region (Columbia, Willamette, and Snake River basins of Idaho, Oregon, and Washington, and portions of Montana and Wyoming) experiences drought more frequently than most other regions of the nation. During 1895-1995, much of the state was in severe or extreme drought at least 5 percent of the time. The east slopes of the Cascades and much of Western Washington was in severe or extreme drought from 5 to 10 percent of the time. Chelan County

⁶ Chelan County Hazard Inventory and Vulnerability Assessment; and WA Department of Ecology, Water Resources Division

has experienced drought conditions 10-15% from 1895 to 1995, more than 30% from 1985 to 1995, and 30-40% from 1976 to 1977. The 2001 drought was the second worst drought on record. While no official drought declarations were issued, low-water conditions existed, at times, during 2004-2010.

Vulnerability

Locally, droughts have left a major impact on individuals and the agriculture, timber and hydroelectric industries. Lack of snowpack has forced ski resorts and other recreation based companies into bankruptcy. The primary effects of drought in Chelan County include loss of fruit and dryland crops, loss of range and domestic animals, wildlife and wildlife habitat, and extreme increase in the danger for wildland fires. Secondary effects involve social and economic hardships due to crop losses, energy curtailment, temporary unemployment, domestic and municipal water shortages and increased number of major wildfires.

Socioeconomic factors in Chelan County contribute to drought vulnerability as shown below (State rank in parentheses).

Time in serious or extreme drought (1895-1995)	10-15%
Irrigated agricultural land (acres)	30,562 (10)
Harvested agricultural land (state rank)	92.1% (3)
Market value (state rank)	\$146,403,000 (10)
Population growth 1990-2000	26.6%
Median household income (<75% state average of \$45,776)	\$37,316
Distressed County (unemployment>20% state average)	YES

Because of the increased fire danger, forested and grassland areas of Chelan County can become extremely hazardous areas during prolonged drought situations. Populated areas in the county, including cities can be directly affected by low streamflows. Hazardous conditions, including domestic and municipal water shortages, affect the ability of local government to effectively fight fires or provide sufficient water and sewage services.

The map on the following page shows the annual precipitation across the County. Populated areas receive some of the lowest precipitation in the State and are particularly vulnerable to drought conditions.

Probability of recurrence: High

Please see individual jurisdictions for a detailed description of vulnerability and priority measures to address this hazard.

Wildfire⁷

Definition

Wildland fire is burning fuel or other material caused by nature or humans that result in the uncontrolled destruction of forests, brush, field crops, grasslands, and real and personal property in non-urban areas.

Types

Wildland fires are of one type, although wildland fire intensity revolves around three elements: fuel, weather, and terrain.

Fuel

Lighter fuels such as grasses, leaves and needles quickly expel moisture and burn rapidly, while heavier fuels such as tree branches, logs and trunks take longer to warm and ignite. Snags and hazard trees are prolific in the forests of Chelan County

Weather

East of the Cascades, summer drying typically starts in mid June and runs through early September, with drought conditions extending this season. Passage of a dry, cold front through this region can result in sudden increase in wind speeds and a change in wind direction affecting fire spread. Thunderstorm activity with dry lightning occurs in Chelan County

Terrain The steep terrain characteristic of Chelan County encourages the spread of wildland fires uphill and discourages fire-fighting efforts.

Location and Extent

The geographical location and climate of Chelan County makes the entire county vulnerable to wildland fires. Although many wildland fires have been human caused, the most devastating wildland fires have been naturally-occurring. The thunderstorm season of late July and early August brings dry lightning. During this period each year, hundreds of ground strikes by lightning are recorded.

The effects of wildland fire on Chelan County vary with the intensity of the fire which is affected by fuel types, topography and time of year. Significant effects of wildland fire include loss of live, personal injury, damage to private and public property and economic impact. Fires in the past, especially the 1994 fires caused economic impact on local business. This not only impacts business, but government due to loss of tax revenue.

Wildland fires also cause negative impacts on watersheds which, among other things, increases the soil erosion and stream degradation that contributes to potential flooding in the County.

⁷ Chelan County Hazard Inventory and Vulnerability Assessment

For most years, wildfire season in the State of Washington runs from mid May through October. In Eastern Washington, any prolonged period of low precipitation presents a potentially dangerous problem. In Chelan County the probability of a wildland fire starting at a particular location depends upon fuel conditions and topography, time of year, weather conditions and the level of human activities occurring that day; however, wildland fires have occurred in almost every month of the year. Drought, snow pack, and local weather conditions can expand the length of the fire season. The early and late shoulders of the fire season usually are associated with human-caused fires, with the peak period of July, August and early September related to thunderstorms and lightning strikes.

Short-term loss caused by a wildland fire can include the destruction of timber, wildlife habitat, scenic vistas, and watersheds; vulnerability to flooding increases due to the destruction of watersheds. Long-term effects include smaller timber harvests, reduced access to affected recreational areas, and destruction of cultural and economic resources and community infrastructure.

Occurrences

Data from the Wenatchee National Forest shows that during the period from 1981 to 1990 there were a total of 639 fires in the forest, within Chelan County. 404 (63%) were lightning caused and 235 (37%) were human caused.

The Tyee, Round Mountain and Hatchery Creek fires of 1994 and Dinklemen fire of 1988 were from lightning strikes. The Rat Creek fire (1994 fires) was human caused. The 1994 fires consumed over 292 square miles (10% of the County) of wildland, forest and private property over a one month period. Total cost of suppression, damages and rehabilitation exceeded 100 million dollars.

Recent fires have shown that Chelan County is extremely vulnerable to wildland fires and that their effects are devastating.

Table 1. Significant Wildland Fires Since 1900

Year	Fire	Area	Acres Burned	<u>Impacts</u>
1970	Lightning Bust	Chelan and Okanogan Counties	188,000	
1988	Dinkelman	Chelan County	50,000	1 death.
1992	Castlerock	Wenatchee		24 homes destroyed.
1994	Tyee Creek, Hatchery Creek, Rat Creek, Round Mountain	Chelan County	180,000	2,700 homes threatened and evacuated, 37 homes destroyed.
2001	Rex Creek Complex / Virginia Lake Complex	Colville Indian Reservation and Chelan, Ferry, Okanogan Counties	130,000	Hundreds of homes threatened, 10 destroyed.

Table 1. Significant Wildland Fires Since 1900

Year	Fire	Area	Acres Burned	<u>Impacts</u>
2001	Union Valley		4,700	100 structures threatened, 3 destroyed.
2004	Icicle Fire	Leavenworth	778	
2004	Pot Peak	Lake Chelan	17,226	Three (3) outbuildings damaged
2004	Sisi Ridge	Lake Chelan	280	
2004	Deep Harbor	Lake Chelan	29,700	Holden Village evacuated
2004	Fischer	Dryden/Cashmere	16,513	One (1) home destroyed, two (2) outbuildings destroyed
2004	DirtyFace	Lake Wenatchee	270	
2005	DirtyFace	Lake Wenatchee	1,150	
2006	Tin Pan	Upper Entiat Valley	9,274	
2006	Flick Creek	Lake Chelan/Stehekin	7,883	
2007	Domke Lake	Lake Chelan/Lucerne	11,900	Holden Village evacuated
2007	Easy Street	Wenatchee	5,290	Two (2) outbuildings destroyed

Vulnerability

Wildland fires, particularly in the urban interface, are one of Chelan County's greatest natural hazards. Chelan County's dry summer climate, topography, large forested area, and open grasslands, combined with heavy recreational use makes the entire county susceptible to wildland fire. Wildfires in the summer months are difficult to suppress. This has resulted in long-term resource loss, increased flood potential and loss to private and public property.

As Chelan County grows and citizens continue to build in the wildland urban interface, wildland fire potential grows and the probability of fire starts increases. Combined with a lack of public understanding and the lack of preventive measures on the part of the public, the potential for devastating losses continues to increase.

Chelan County contains several urban interface communities that are considered to be at high risk to wildland fire as designated by the State Forester, including the cities of Cashmere, Entiat, Leavenworth, and Wenatchee and the rural villages of Stehekin, Peshastin, and Manson.

The map on the following page shows the urban wildland interface areas within the County where wildland fire is most likely to significantly impact the built environment.

Probability of recurrence: High

Please see individual jurisdictions for a detailed description of vulnerability and priority measures to address this hazard.

Avalanches⁸

Definition

An avalanche occurs when a layer of snow loses its grip on a slope and slides downhill.

Types

Snowslides or avalanches are basically of two types, loose snow and slab. Loose snow avalanches start at a point or over a small area. Slab avalanches, on the other hand, start when a large area of snow begins to slide at the same time. Snow avalanches grow in size and the quantity of snow involved increases as they descend. Steep slopes, usually from 30 to 50 degrees, and snow, are the only requirement for avalanches. The forces generated by moderate or large avalanches can damage or destroy most man made structures. Loose avalanches occur when grains of snow cannot hold onto a slope and begin sliding downhill, picking up more snow and fanning out in an inverted V. Slab avalanches occur when a cohesive mass of snow breaks away from the slope all at once.

Dry slab avalanches occur when the stresses on a slab overcome the internal strength of the slab and its attachment to surrounding snow. A decrease in strength produced through warming, melting snow, or rain, or an increase in stress produced by the weight of additional snowfall, a skier or a snowmobile cause this type of avalanche. Dry slab avalanches can travel 60 to 80 miles per hour, reaching these speeds within five seconds after the fracture; they account for most avalanche fatalities. Wet slab avalanches occur when water percolating through the top slab weakens it and dissolves its bond with a lower layer, decreasing the ability of the weaker, lower layer to hold on to the top slab, as well as decreasing the slab's strength.

Location and Extent

Much of Chelan County is located in the Cascade Mountains, which receive extensive precipitation due to their size and orientation to the flow of Pacific marine air. The winter snowpack is among the deepest recorded in the United States. In Chelan County, avalanche season can begin in November and continue into early summer. In the higher alpine areas, the avalanche season continues year round.

There are primarily two areas where avalanches occur that affect the citizens and infrastructure of Chelan County--transportation routes and recreation areas. Stevens Pass and Tumwater Canyon along US HWY 2 and Blewett Pass along HWY 97 are located in avalanche probe areas. Additionally, avalanches threaten backcountry recreation areas. With better equipment allowing more people to explore further into the wilderness, areas threatened by avalanche are those accessible by skiers, snowshoers, snowboarders, climbers, and snowmobilers outside developed ski resorts in the mountains of Washington.

Occurrences

Avalanches occasionally occur along state transportation routes at Blewett Pass, Stevens Pass, and Tumwater Canyon, although these events are usually cleared within a few hours. Backcountry avalanches have also occurred, including some at Mission Ridge Ski Resort in

⁸ Chelan County Hazard Inventory and Vulnerability Assessment; and WA Department of Transportation, North Central Region (Wenatchee)

southern Chelan County. There have been some fatalities in Chelan County as a result of avalanches. On March 1, 1910 the Wellington disaster occurred just west of the County line, on Stevens Pass. Two stranded passenger trains were swept away and buried by an avalanche. 96 people lost their lives in this disaster. Additionally, there have been the following avalanche fatalities in Chelan County.

Avalanche Fatalities

<i>Year</i>	<i>Location</i>	<i>Fatalities</i>
1962	Stevens Pass	2
1971	Stevens Pass/Yodelin	4
1978	Mission Ridge	1
1994	Mission Ridge	1

Vulnerability

Due to the presence of key transportation routes and recreation areas in the Cascades, Chelan County is one of the most vulnerable Counties in the State to avalanche disasters; however, avalanches in Chelan County do not typically adversely affect significant populations or infrastructure. Most current avalanche victims are participating in recreational activities in the backcountry where there is no avalanche control. Only one-tenth of one percent of avalanche fatalities occurs on open runs at ski areas or on highways. Because of increased winter recreational use in the Wenatchee National Forest and other adjacent lands in Chelan County, a larger amount of people are becoming exposed to avalanche risks.

The map on the following page shows the location of key transportation routes through Chelan County that are subject to avalanche hazards.

Probability of recurrence: High

Please see individual jurisdictions for a detailed description of vulnerability and priority measures to address this hazard.

Section III: Policy and Program Analysis

Local policies and programs are central pieces of the Chelan County Multi-jurisdiction Natural Hazard Mitigation Plan, and the plan evaluates local policies and programs for two reasons: (1) Understanding the local policies and programs related to natural hazards provides an opportunity to determine the current policy framework in place and (2) Having this understanding allows policymakers and implementers of the plan to focus their efforts on key policies and programs that could have the most impact on natural hazard mitigation. The policy and program analysis provided the foundation for many of the mitigation actions found in the plan as well.

The Chelan County Emergency Management Council recognized that hazard mitigation actions are generally either programmatic or project-specific and that different drivers would affect implementation of these efforts. For example, making changes to local building codes to require fire-resistant roof materials in areas subject to wildland fires might require minimal investment from a local government but require a higher level of investment from an individual property owner by shifting the financial burden. Conversely, implementing this type of program with cost-share or grant funds would likely expedite its implementation. Stand-alone capital projects funded by grant programs are largely acceptable and affordable to the local community, although grant funds can be difficult to obtain. One area that needs for more work locally is identifying the availability of grant funding for implementation of high-priority actions identified in this plan. The EMC considered the existing policies and programs when developing the priority rating criteria as well as the benefit cost analysis by identifying suitable criteria that would apply to both programmatic and capital project approaches to address hazard mitigation in order to facilitate implementation of high-priority actions.

The Policy and Program Analysis is divided into four categories:

1. Document Title
2. Citation
3. Policy or Requirement
4. Application

The Policy and Program Analysis is presented on the following pages in a spreadsheet format according to these categories for ease of use.

Natural Hazard Mitigation-Related Policies and Programs by Jurisdiction

DOCUMENT TITLE	CITATION	POLICY OR REQUIREMENT	APPLIES TO
CITY OF CASHMERE			
Cashmere Zoning Code	Chapter 17.62	Planned Unit Development permits may be used to protect critical areas, wetlands and floodways.	All Permit
International Building Code	Chapter 16	This chapter governs the structural design load requirements of building and structures including but not limited to wind, snow, floods, earthquakes, etc.	All Permit
Comprehensive Plan	Land Use Element	Preserve and protect critical areas including frequently flooded areas and geologically hazardous areas when considering development near these natural hazard areas.	All Permit
Critical Areas	Chapter 18.10A	Provides for reasonable protection of the natural environment and general public health, safety and welfare due to flooding, landslides, or failure of steep slopes. Special permits may be required based on finds.	All Permit
Flood Damage Protection	Chapter 18.10E	Focuses on hazard reduction due to floods and requiring development permits in these areas	All Permit
Subdivision Code	Permitting information	Requires to provide location of the	All Permit

critical areas, including frequently flooded and geologically hazardous areas, on maps in development application process as well as addressing the impacts to them.

CITY OF CHELAN

International Building Code	Chapter 16	This chapter governs the structural design load requirements of buildings and structures including but not limited to wind, snow, floods, earthquakes, etc.	All Permit
Building Code	Chapter 15.10	This chapter regulates development in flood hazard areas as required by RCW 35A.11.020.	All Permit
Subdivision Code	Chapter 16.04.050	Potential flood areas, steep slopes or other hazards, as deemed by the planning commission, are not suitable to be subdivided.	All Permit
Zoning Code	17.54.030.C	This provision contains wording that recommends no mobile home pads shall be located in a non-suitable building area, as defined by the board of adjustments.	All Permit
Comprehensive Plan	Section IV Goal 2 pg 37	Permits development in critical areas when protecting life and property. Discourages development in areas that are susceptible to landslide, flood, avalanche, unstable soils and excessive slopes, unless appropriate safeguards are taken.	All Permit

Building Code	Chapter 15.08 Flood	Reviews the responsibility of the building inspector, planning commission and Health District when reviewing	All Permit
Environmentally Sensitive Areas	Chapter 14.10	The entire chapter contains provisions regulating development in sensitive areas to protect public well-being.	All Permit
<i>CHELAN COUNTY (UNINCORPORATED)</i>			
Zoning Code	Chapter 11.84	Designates a frequently flooded overly district to provide for development within 100 year flood zone based on the provisions set forth. Also provide geologically hazardous overlay district that applies to development permits within those designated areas.	All Permit
International Building Code	Chapter 16	This chapter governs the structural design load requirements of building and structures including but not limited to wind, snow, floods, earthquakes, etc.	All Permit
Flood Hazard Development	Chapter 3.20	Requires that subdivisions, building permits and other development permits that fall in potentially flooded areas will be constructed to minimize the impact to the development as well as protect the public health, safety and welfare.	All Permit
Development Permit	Section 14.14.050	Requires that all permits meet the Procedures and minimum requirements set forth in all plans and ordinances, including flood hazard ordinances. Permit applications shall provide a statement of the compatibility to natural hazard and critical areas.	All Permit

Comprehensive Plan	Land Use Element	Requires classification, designation and protection of frequently flooded areas. Regulates development in natural hazard areas, such as landslide, flood, avalanche, etc., to protect the public health, safety and general welfare.	All Permit
Subdivision Code	Section 1070	Lands that are determined unsuitable by the county shall not be subdivided unless adequate protective improvements are provided. Does not allow subdivisions that may potentially increase flood flows. Requirements of Chapter 3.20 of the Chelan County Code and Chapter 11.84 of Title 11, Zoning resolution apply if part of the plat lies within the 100 year flood plain.	All Permit

CITY OF ENTIAT

International Building Code	Chapter 16	This chapter governs the structural design requirements of building and structures including but not limited to wind, snow, floods, earthquakes, etc.	All Permit
Comprehensive Plan	General Goals & Policies	Important to respect the development limitations in natural hazard areas and discourages obstructions in those areas	All Permit
Critical Areas	Chapter 17.10A	Purpose is to protect natural environment and general public health, safety and welfare. This is accomplished by reviewing all types of development in these critical areas.	All Permit

Development Regulations	Section 14.02	Special permits may be required based Stresses that permitting agencies will review projects and avoid potential environmental impacts.	All Permit
Zoning Code	Section 18.18.060	Development in or near critical areas will require permits.	All Permit
<i>CITY OF LEAVENWORTH</i>			
Comprehensive Plan	Goal 1 & 4 - Land Use Element	Development is discouraged in natural hazard areas to protect public health, safety and welfare. It also encourages identifying natural hazard areas by classifying, designating and protecting those areas.	All Permit
International Building Code	Chapter 16	This chapter governs the structural design load requirements of building and structures including but not limited to wind, snow, floods, earthquakes, etc.	All Permit
Flood Damage Prevention Standards	Chapter 14.24	Stipulates that any development within a flood hazard area shall be required to meet the minimum requirements set forth for public health, safety and welfare	All Permit
Critical Areas	Article 4	The intent of this article is to reduce threat to those areas susceptible to geologic hazard events by mitigation for public benefit.	All Permit
Zoning Code	Chapter 18.70	Requires development permits in areas which could be inundated by floodwaters with 1% or greater chance of occurrence per year.	All Permit

CITY OF WENATCHEE

Comprehensive Plan	Shorelines	Stresses the need for flood control and flood resistant building practices within frequently flooded areas.	All Permit
Resource Lands and Critical Areas	Ordinance #2902	Established to manage lands susceptible to natural hazards and administer development within those areas, including frequently flooded areas and geologically hazardous areas.	All Permit
International Building Code	Chapter 16	This chapter governs the structural design load requirements of building and structures including but not limited to wind, snow, floods, earthquakes, etc.	All Permit
Subdivision Code	Article I	Mentions the need to be in compliance with Ordinance 2902 Resource Lands and Critical Areas Development. Lands that are determined unsuitable by the city shall not be subdivided unless adequate protective improvements are provided.	All Permit
Flood Protection	Chapter 2.05	This chapter sets standards for development in flood areas.	All Permit
Zoning Code	Section XVIII	Requires review of permits/approvals to protect critical areas as established by critical areas code, including frequently flooded areas and geologically hazardous areas.	All Permit
Comprehensive Plan Executive Summary		Addresses the need to recognize development limitations in critical	All Permit

natural areas and to manage these areas
accordingly

Section IV: Natural Hazard Mitigation Strategy

Overview

The Mitigation Strategy is the heart of the Chelan County Multi-Jurisdiction Natural Hazard Mitigation Plan and is inextricably-linked to the individual sub-plans developed by the specific jurisdictions within Chelan County. The Mitigation Strategy contains the development process for the plan; mission and goals for mitigation actions; prioritization process for mitigation actions; and finally the actions themselves. The Mitigation Strategy applies to Chelan County and the cities of Cashmere, Chelan, Entiat, Leavenworth, and Wenatchee and provides the overall framework for mitigation actions within the County. In addition to the Mitigation Strategy, the cities have developed individual sub-plans that more specifically address their local concerns. This integrated approach has been taken due to the similarity of hazard vulnerabilities and actions between jurisdiction and the differences. For the 2010 update, the EMC and its members reviewed the 2004 Mitigation Strategy and generally felt that it is a sound and still appropriate approach to mitigating the effects and preventing natural disasters. The recent history of natural disasters was consistent with the priorities given to each, and current building trends reflected a general tendency away from natural disaster prone areas. All of the actions contained within the Mitigation Strategy were developed collaboratively by all EMC members and reviewed for the 2010 update.

Mitigation Strategy Development

The hazard mitigation strategy includes a description of mitigation goals and objectives to reduce or avoid long-term vulnerabilities to the hazards identified in the Risk Assessment. The mitigation strategy includes sections that identify and analyze a comprehensive range of specific mitigation measures being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

The development of a mitigation strategy begins with a review of the categories of mitigation goals, as outlined by FEMA. Using this template, and adjusting it to fit Chelan County's mission statement, the Planning Team developed goals specific to Chelan County. Through incorporation of the analysis and conclusions found in the Risk Assessment and the Policy and Program Analysis, the Planning Team identified specific mitigation measures and prioritized them through a process of project review and public participation tailored to Chelan County's unique needs and capabilities. Central to this entire process is the continual involvement of the public.

Mission: To promote sound public policy designed to protect citizens, critical facilities, infrastructure, private property and the environment from natural hazards by increasing public awareness, documenting the resources for risk reduction and loss-prevention, and identifying activities to guide Chelan County towards building a safer, more sustainable community.

The Chelan County Plan goals are listed in priority order as follows:

1. **To Protect People** by implementing activities that assists in protecting lives

2. **To Protect Property** by making Chelan County homes, businesses, infrastructure, critical facilities, and other property more disaster-resistant to losses from natural hazards
3. **To Protect Economy** by developing mechanisms that ensure that commerce, trade, and essential business activities remain viable in the event of a natural disaster
4. **To Protect Environment** by preserving, rehabilitating, and enhancing natural systems to serve natural hazard mitigation functions
5. **To Strengthen Emergency Services** by increasing collaboration and coordination among public agencies, non-profit organizations, business, and industry
6. **To Increase Public Awareness and Education** by providing public awareness and education on natural hazards as well as tools and funding resources to assist in implementing mitigation activities
7. **To Establish and Strengthen Partnerships for Implementation** by coordinating and collaborate among public agencies, citizens, non-profit organizations, businesses, tribes, and industry whose authorities and capabilities will support implementation of planning for a disaster-resistant Chelan County

To help achieve each goal, the plan identifies mitigation measures--specific actions or projects that help mitigate risk for Chelan County. The planning process of data-collection, research, and public participation leads to the development of these measures. This process is extremely important because it ensures that the measures speak to the risks specific to Chelan County and that these measures be implementable. Therefore, central to the process of selecting mitigation measures from Chelan County's goals and objectives is the Risk Assessment.

The outcomes of the Risk Assessment illustrate the hazards to which Chelan County has the most vulnerability. The Risk Assessment provides focus for Chelan County's goals through identification of Chelan County's vulnerability to specific hazards. Based on these hazards, the Planning Team identified specific mitigation measures.

Once the measures are identified, they are further defined in terms of the goals and objectives they address as well as the hazards they mitigate. Evaluation of the measures follows their identification and definition.

Prioritization of Mitigation Actions

The measures having been identified and described, the rest of the process involves prioritization. The process relies upon Chelan County's identified risks and vulnerabilities, the Emergency Management Council's political duty and authority through Chelan County's chief elected officials, and public participation.

The Chelan County Emergency Management Council used the following Prioritization Criteria that are directly linked to the Plan goals.

- 1. PEOPLE (25 Points maximum)**
Protects lives and reduces public risk
- 2. PROPERTY (20 Points maximum)**
Reduces the level of hazard damage vulnerability in existing and/or future structures and developed property
- 3. ECONOMY (15 Points maximum)**
Encourages continuation of essential business activities
- 4. ENVIRONMENT (10 Points maximum)**
Protects natural systems that mitigate effects of natural disasters
- 5. EMERGENCY SERVICES (5 Points maximum)**
Encourages emergency service providers to improve coordinate and collaborate services
- 6. EDUCATION (5 Points maximum)**
Educates and raises the awareness of the community on natural hazards and activities to address their effects
- 7. PARTNERSHIP (5 Points maximum)**
Encourages inter-jurisdictional and inter-agency cooperation across multiple sectors of the community

After presentation and discussion, each EMC member ranked all the potential mitigation actions by assigning points to each action based on the applicability of each criterion. The maximum number of points that an action could receive was 85 if it qualified for all seven criteria. All of the mitigation actions were prioritized for each category of hazard, including multi-hazard mitigation measures.

Mitigation Actions

Mitigation Actions are described using the following format:

Lead Agency: Entity who could coordinate or lead development of the mitigation action

Timeline: General timeframe for action to be implemented

Plan Goals Addressed: Goals addressed as determined through prioritization process

Benefit Cost Score: Ratio score described in benefit cost analysis

Priority Score: Priority score based on prioritization criteria above

Funding: Potential funding source to implement actions

Multi-Hazard Mitigation Actions

Multi-hazard action items are those activities that pertain to all eight hazards in the mitigation plan, including flood, landslide, wildfire, severe storm, drought, earthquake, avalanche and volcanic eruption. The actions identified in the 2004 plan and the actions identified in this 2011 update are largely unchanged due to several factors, including the lack of change in relative hazard impacts, the overall appropriateness of these actions to address natural hazards in Chelan County and the cities, and the considerable funding challenges faced by EMC members to implement mitigation actions in addition to providing basic emergency services. In general, because of these factors, there were no actions identified in the 2004 plan that have been fully implemented as of December 2011; however, minor efforts that have been implemented at the jurisdiction level have been updated in the appropriate sections of this plan.

Priority 1. Develop disaster response plans for all hazards

- Integrate the evacuation routes data into the Chelan County Emergency Operations Plan
- Identify roles of various emergency response agencies
- Assess equipment and educational needs
- Identify training necessary to carry out a coordinated response

Lead Agency: Chelan County Emergency Management (Sheriff)

Timeline: Ongoing

Plan Goals Addressed: Protect People, Property, Economy, Environment, Emergency Services, Education, Partnerships

Benefit Cost Score: 1

Priority Score: 85

Potential Funding Source: Funding could be obtained through local budget or grants.

Priority 2. Develop, enhance, and implement education programs aimed at mitigating natural hazards, and reducing the risk to citizens, public agencies, private property owners, businesses, and schools

- Make the Chelan County Natural Hazards Mitigation Plan available to the public by publishing the plan electronically on the county and emergency management websites
- Create a website that includes information specific to Chelan County residents, including site-specific hazards information, building codes information, insurance companies that provide earthquake insurance for county residents, and educational information on damage prevention
- Develop and complete a baseline survey to gather perceptions of private citizens and the business community regarding natural hazard risks and identify mitigation needs. Repeat the survey in five years to monitor successes and failures of natural hazard mitigation programs
- Develop outreach programs to business organizations

- Develop curriculum for school programs and adult education on reducing risk and preventing loss from natural hazards.
- Conduct natural hazards awareness programs in schools and community centers.
- Conduct workshops for public and private sector organizations to raise awareness of mitigation activities and programs.

Lead Agency: Chelan County Emergency Management (Sheriff)

Timeline: Ongoing

Plan Goals Addressed: Protect People, Property, Economy, Emergency Services, Education, Partnership

Benefit Cost Score: 2

Priority Score: 75

Potential Funding Source: Funding could be obtained through local budget or grants.

Priority 3. Identify recurring utility outage areas and work with utility providers to remove hazards along those areas

Lead Agency: Chelan County Emergency Management (Sheriff), City Public Works Depts.

Timeline: 2-3 years

Plan Goals Addressed: Protect People, Property, Economy, Emergency Services, Education, Partnerships

Benefit Cost Score: 1

Priority Score: 75

Potential Funding Source: Local utility district may be interested in funding effort.

Priority 4. Strengthen emergency services preparedness and response by linking emergency services with natural hazard mitigation programs

- Educate private property owners on limitations of bridges and dangers associated with them
- Develop a process to encourage private property owners to upgrade their bridges to support weight of fire trucks and emergency vehicles
- Encourage individual and family preparedness through public education projects such as safety fairs
- Coordinate the maintenance of emergency transportation routes through communication among Chelan County Public Works, neighboring jurisdictions, and the Washington Department of Transportation
- Identify opportunities for partnering with citizens, private contractors, and other jurisdictions to increase availability of equipment and manpower for efficiency of response efforts
- Work with neighborhood groups to establish community response teams
- Familiarize public officials of requirements regarding public assistance for disaster

response

Lead Agency: Chelan County Emergency Management (Sheriff)

Timeline: Ongoing

Plan Goals Addressed: Protect People, Property, Economy, Emergency Services, Education, Partnerships

Benefit Cost Score: 2

Priority Score: 75

Potential Funding Source: Funding could be obtained through local budget or grants.

Priority 5. Continue to implement existing programs, policies and regulations as identified within the plan.

Lead Agency: Chelan County Emergency Management (Sheriff), Chelan County Natural Resource Department, Chelan County Planning, City Planning Departments

Timeline: 2-3 years

Plan Goals Addressed: Protect People, Property, Economy, Education

Benefit Cost Score: 1

Priority Score: 65

Potential Funding Source: Ongoing budgets

Priority 6. Use technical knowledge of natural ecosystems and events to link natural resource management and land use organizations to mitigation activities and technical assistance.

- Review ordinances that protect natural systems and resources to mitigate for natural hazards for possible enhancements.
- Pursue vegetation and restoration practices that assist in enhancing and restoring the natural and beneficial functions of the watershed.
- Develop education and outreach programs that focus on protecting natural systems as a mitigation activity.

Lead Agency: Chelan County Emergency Management (Sheriff), Chelan County Natural Resource Department, Chelan County Planning, City Planning Depts.

Timeline: Ongoing

Plan Goals Addressed: Protect Property, Environment, Education, Partnerships

Benefit Cost Score: 2

Priority Score: 40

Potential Funding Source: Funding could be obtained through local budget or grants.

Priority 7. Make available back-up power sources to vulnerable populations

Lead Agency: Chelan County Emergency Management (Sheriff)

Timeline: 2-3 years

Plan Goals Addressed: Protect People, Emergency Services

Benefit Cost Score: 1

Priority Score: 30

Potential Funding Source: Local utility district may be interested in funding effort

Flood Hazard Mitigation Action Items

The flood mitigation action items provide direction on specific activities that the Chelan County Emergency Management Council and its member organizations 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 the Chelan County Emergency Management Council and local decision makers in pursuing strategies for implementation.

Priority 1. Analyze repetitive flood properties, particularly critical facilities, within Chelan County and identify feasible mitigation options or possible purchase and relocation opportunities

- Identify appropriate and feasible mitigation activities for identified repetitive flood properties. Funding may be available through FEMA's Hazard Mitigation Grant and Flood Mitigation Assistance Programs and the Pre-disaster Mitigation Program
- Contact repetitive loss property owners to discuss mitigation opportunities, and determine interest should future project opportunities arise
- Explore options for incentives to encourage property owners to engage in mitigation

Lead Agency: Chelan County Emergency Management (Sheriff), Chelan County Planning, City Planning Depts.

Timeline: 3 Years

Plan Goals Addressed: Protect People, Property, Economy, Environment, Emergency Services, Education, Partnership

Benefit Cost Score: 1

Priority Score: 85

Potential Funding Source: Funding could be obtained through local budget or grants.

Priority 2. Recommend revisions to requirements for development within the floodplain, where appropriate

- Evaluate elevation requirements for new residential and nonresidential structures in the unincorporated floodplain area
- Identify opportunities to upgrade Federal Insurance Rate Map, and arrange for Cooperative Technical Partnership mapping upgrades for select areas
- Identify alternatives to reduce development in the floodplain

Lead Agency: Chelan County Planning, City Planning Depts.

Timeline: 1-2 years

Plan Goals Addressed: Protect People, Property, Economy, Environment, Education, Partnerships

Benefit Cost Score: 2

Priority Score: 80

Potential Funding Source: Funding could be obtained through state (Dept. of Ecology) or federal (FEMA) sources

Priority 3. Community education to alert the public of flooding hazards

- Educate citizens on flood vulnerability
- Develop educational materials on ways to reduce flooding hazard

Lead Agency: Chelan County Emergency Management (Sheriff)

Timeline: Ongoing

Plan Goals Addressed: Protect People, Property, Economy, Emergency Services, Education, Partnership

Benefit Cost Score: 2

Priority Score: 75

Potential Funding Source: Funding could be obtained through local budget or grants.

Priority 4. Encourage development of land protection and management strategies to preserve open space for flood mitigation, fish habitat, and water quality in the floodplain

- Develop a comprehensive strategy for protecting and managing floodplain open space in Chelan County
- Explore funding for property protection from federal (e.g., FEMA Hazard Mitigation Grant Program), state, regional, and local governments, as well as private and non-profit organizations, trails programs, fish programs as well as options for special appropriations
- Develop a regional partnership between flood mitigation, fish habitat, and water quality enhancement organizations/programs to improve educational programs
- Identify sites where environmental restoration work can benefit flood mitigation, fish habitat, and water quality
- Work with landowners to develop flood management practices that provide healthy fish habitat
- Identify existing watershed education programs and determine which programs would support a flood education component

Lead Agency: Chelan County Natural Resource Department, City Planning Depts.

Timeline: 5 years

Plan Goals Addressed: Protect People, Property, Environment, Education, Partnerships

Benefit Cost Score: 2

Priority Score: 65

Potential Funding Source: Funding could be obtained through state natural resource agencies, particularly WA Dept of Fish and Wildlife

Priority 5. Enhance data and mapping for floodplain information within the county and cities, and identify and map flood-prone areas outside of designated floodplains

- Apply for FEMA's cooperative technical partnership
- Update the flood-loss estimates for Chelan County
- Encourage the development of floodplain maps for all local streams not currently mapped on Flood Insurance Rate Maps or county maps, with special attention focused on mapping rural and unincorporated areas. The maps should show the expected frequency of flooding, the level of flooding, and the areas subject to inundation. The maps can be used for planning, risk analysis, and emergency management.
- Prepare an inventory of culverts that historically create flooding problems and target them for retrofitting

Lead Agency: Chelan County Planning, City Planning Depts.

Timeline: 3 years (as funding allows)

Plan Goals Addressed: Protect Property, Environment, Emergency Services, Education, Partnerships

Benefit Cost Score: 2

Priority Score: 45

Potential Funding Source: Funding could be obtained through local budget or grants.

Priority 6. Develop better flood warning systems.

- Distribute information regarding flooding to the general public efficiently

Lead Agency: Chelan County Emergency Management (Sheriff)

Timeline: 1-2 years

Plan Goals Addressed: Protect People, Emergency Services, Partnerships

Benefit Cost Score: 1

Priority Score: 35

Potential Funding Source: Funding could be obtained through local budget or grants.

Priority 7. Establish a framework to compile and coordinate surface water management plans and data throughout the county

- Develop surface water management plans.

Lead Agency: Chelan County Public Works, City Public Works

Timeline: 3-5 years

Plan Goals Addressed: Partnerships for Implementation

Benefit Cost Score: 1

Priority Score: 5

Potential Funding Source: Funding could be obtained through local budget or grants.

Earthquake Hazard Mitigation Actions

The earthquake mitigation action items provide guidance on suggesting specific activities that the Chelan County Emergency Management Council and its member organizations can undertake to reduce risk and prevent loss from earthquake events. Each action item is followed by ideas for implementation, which can be used by the Chelan County Emergency Management Council and local decision makers in pursuing strategies for implementation.

Priority 1. Recommend revisions to building codes and construction techniques to address earthquake hazards, where appropriate

- Evaluate building code requirements for new residential and nonresidential structures in earthquake hazard zones
- Explore raising construction standards for new development in earthquake hazard zones
- Identify alternatives to reduce development in earthquake hazard zones

Lead Agency: Chelan County Planning, City Planning Depts.

Timeline: 1-2 years

Plan Goals Addressed: Protect People, Property, Economy, Environment, Education, Partnerships

Benefit Cost Score: 2

Priority Score: 80

Potential Funding Source: Funding could be obtained through local budget

Priority 2. Prioritize seismic retrofit for critical facilities for critical facilities to meet the most current standards for new buildings to the maximum extent possible

Lead Agency: Chelan County Emergency Management (Sheriff)

Timeline: 2-3 years

Plan Goals Addressed: Protect People, Property, Economy, Emergency Services, Education, Partnership

Benefit Cost Score: 2

Priority Score: 75

Potential Funding Source: Funding could be obtained through local budget or grants.

Priority 3. Mitigate the non-structural impacts of an earthquake on all city and county critical facilities

Lead Agency: Chelan County Emergency Management, Chelan County Public Works, Chelan County Planning, City Planning

Timeline: 1-2 years

Plan Goals Addressed: Protect People, Property, Economy, Environment, Partnerships

Benefit Cost Score: 2

Priority Score: 75

Potential Funding Source: Funding could be obtained through local budget or grants.

Priority 4. Perform structural and nonstructural retrofitting of seismically vulnerable facilities and structures

- Provide information for property owners, small businesses, and organizations on sources of funds (loans, grants, etc.)
- Explore options for including seismic retrofitting in existing programs such as low-income housing, insurance reimbursements, and pre- and post-disaster repairs
- Develop an inventory of schools, universities, and critical facilities that do not meet current seismic standards by performing seismic strength evaluations

Lead Agency: Chelan County Emergency Management (Sheriff)

Timeline: ongoing

Plan Goals Addressed: Protect People, Property, Economy, Emergency Services, Education, Partnership

Benefit Cost Score: 1

Priority Score: 75

Potential Funding Source: Funding could be obtained through local budget or grants.

Priority 5. Perform public education and awareness to increase the public's knowledge of earthquake hazards inside and outside the home

- Provide information to government building and school facility managers and teachers on securing bookcases, filing cabinets, light fixtures, and other objects that can cause injuries and block exits
- Encourage facility managers, business owners, and teachers to refer to FEMA's practical guidebook: *Reducing the Risks of Nonstructural Earthquake Damage*
- Provide earthquake insurance information to Chelan County residents; and
- Explore partnerships to provide retrofitting classes for homeowners, renters, building professionals, and contractors
- Target development located in potential fault zones or in unstable soils for intensive education and retrofitting resources

Lead Agency: Chelan County Emergency Management (Sheriff)

Timeline: Ongoing

Plan Goals Addressed: Protect People, Property, Economy, Emergency Services, Education, Partnerships

Benefit Cost Score: 2

Priority Score: 75

Potential Funding Source: Funding could be obtained through local budget or grants.

Priority 6. Improve earthquake hazard mapping data and technical analysis for Chelan County

- Update Chelan County earthquake data using more localized data to improve accuracy of the vulnerability assessment for Chelan County
- Conduct risk analysis and create hazard maps using GIS technology to identify risk sites and further assist in prioritizing mitigation activities and assessing the adequacy of current land use requirements

Lead Agency: Chelan County Planning, City Planning

Timeline: 2 years

Plan Goals Addressed: Partnerships for Implementation, Protect People and Property

Benefit Cost Score: 2

Priority Score: 45

Potential Funding Source: Funding could be obtained through local budget

Severe Storm Hazard Mitigation Actions

The severe storm mitigation action items provide direction on specific activities that the Chelan County Emergency Management Council and its member organizations can undertake to reduce risk and prevent loss from severe winter storm events. Each action item is followed by ideas for implementation, which can be used by the Chelan County Emergency Management Council and local decision makers in pursuing strategies for implementation.

Priority 1. Encourage development and enforcement of severe storm-resistant building, siting, and construction codes, particularly snow load requirements

- Evaluate current building codes for efficiency in protecting structures from various severe storm hazards
- Evaluate planning and development regulations for adequacy in mitigating potential damage from severe storm events

Lead Agency: Chelan County Planning, City Planning

Timeline: Ongoing

Plan Goals Addressed: Protect People, Property, Economy, Environment, Education, Partnerships

Benefit Cost Score: 2

Priority Score: 80

Potential Funding Source: Funding could be obtained through local budget

Priority 2. Increase public awareness of severe storm preparation and readiness activities

- Collect information on public education materials for severe storm events
- Distribute educational materials to Chelan residents and public and private sector organizations regarding preparedness, shelters, and evacuation routes during road closures. Target vulnerable populations for disseminating preparedness information.
- Distribute educational materials to Chelan County residents and public and private sector organizations regarding preparedness for no-power situations

Lead Agency: Chelan County Emergency Management (Sheriff)

Timeline: Ongoing

Plan Goals Addressed: Protect People, Property, Economy, Emergency Services, Education, Partnerships

Benefit Cost Score: 2

Priority Score: 75

Potential Funding Source: Funding could be obtained through local budget

Priority 3. Enhance strategies for debris management for severe storm events

- Develop coordinated management strategies pre- and post-severe storm event for de-icing roads, plowing snow, clearing roads of fallen trees, and clearing debris from public and private property

Lead Agency: Chelan County Public Works, City Public Works

Timeline 2 years

Plan Goals Addressed: Protect People, Economy, Environment, Emergency Services, Partnerships

Benefit Cost Score: 1

Priority Score: 60

Potential Funding Source: Funding could be obtained through local budget

Priority 4. Map and publicize locations around the county that have the highest incidence of severe storms

- Identify a responsible agency for central collection and reporting of storm data
- Identify a responsible agency to collect and transfer data to the National Climate Data Center, FEMA, or other agencies concerned with the incidence of storms, to help establish and maintain baseline and historic records of storm events
- Identify public infrastructure and facilities subject to damage or closure during windstorm events.
- Develop partnerships between utility providers and county and local public works agencies to document known hazard areas

Lead Agency: Chelan County Emergency Management (Sheriff)

Timeline 5 years

Plan Goals Addressed: Protect Property, Environment, Emergency Services, Education, Partnerships

Benefit Cost Score: 2

Priority Score: 45

Potential Funding Source: Funding could be obtained through local budget or grants.

Priority 5. Enhance and develop shelter networks currently organized by Red Cross

Lead Agency: Chelan County Emergency Management (Sheriff)

Timeline: Ongoing

Plan Goals Addressed: Protect People, Emergency Services, Partnerships

Benefit Cost Score: 1

Priority Score: 35

Potential Funding Source: Funding could be obtained through local budget or grants.

Priority 6. Enhance notification and weather monitoring systems to notify public of imminent severe storm events

- Coordinate with appropriate organizations to evaluate the need for more weather stations and/or weather instrumentation
- Identify household electronics that can be used to receive severe storm warnings

Lead Agency: Chelan County Emergency Management (Sheriff)

Timeline: Ongoing

Plan Goals Addressed: Protect People, Emergency Services, Partnerships

Benefit Cost Score: 1

Priority Score: 35

Potential Funding Source: Funding could be obtained through local budget or grants.

Volcanic Hazard Mitigation Action Items

Volcanic mitigation action items have not been developed for the Chelan County Multi-jurisdiction Natural Hazard Mitigation Plan due to the relatively low possibility of a volcanic event occurring within the County and due to the relatively low impact that such an event from one of the major volcanoes would have. The multi-hazard mitigation action section includes actions that could apply to volcanic hazards.

Landslide Hazard Mitigation Action Items

The landslide mitigation action items provide direction on specific activities that the Chelan County Emergency Management Council and its member organizations 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 Chelan County Emergency Management Council and local decision makers in pursuing strategies for implementation.

Priority 1. Identify slope areas that threaten critical facilities due to lack of vegetation and erosion control. Prioritize and implement slope stabilization measures.

Lead Agency: Chelan County Planning, City Planning

Timeline: 1-2 years

Plan Goals Addressed: Protect People, Property, Economy, Environment, Emergency Services, Education, Partnerships

Benefit Cost Score: 2

Priority Score: 85

Potential Funding Source: Funding could be obtained through local budget

Priority 2. Reduce risk by improving knowledge of landslide hazard areas and understanding of vulnerability and risk to life and property in hazard-prone areas

- Map landslide hazard areas and incorporate information into the geologically hazardous element of County and City critical areas ordinances
- Limit activities in identified potential and historical landslide areas through regulation and public outreach

Lead Agency: Chelan County Planning, City Planning

Timeline: 2 years

Plan Goals Addressed: Protect People, Property, Economy, Environment, Emergency Services, Education, Partnerships

Benefit Cost Score: 1

Priority Score: 85

Potential Funding Source: Funding could be obtained through local budget or grants.

Priority 3. Encourage construction, subdivision, and location design that can be applied to steep slopes and their hazard areas to reduce the potential adverse impacts to development

- Evaluate existing regulations regarding development in landslide prone areas

Lead Agency: Chelan County Planning, City Planning

Timeline: 3 years

Plan Goals Addressed: Protect People, Property, Economy, Environment, Education, Partnerships

Benefit Cost Score: 2

Priority Score: 80

Potential Funding Source: Funding could be obtained through local budget

Priority 4. Develop public information to emphasize economic risk when building on potential or historical landslide areas

- Identify existing mechanisms for public outreach
- Develop educational materials for landowners in geologically hazardous areas

Lead Agency: Chelan County Emergency Management (Sheriff)

Timeline: Ongoing

Plan Goals Addressed: Protect People, Property, Economy, Emergency Services, Education, Partnerships

Benefit Cost Score: 2

Priority Score: 75

Potential Funding Source: Funding could be obtained through local budget or grants.

Drought Hazard Mitigation Action Items

The drought mitigation action items provide direction on specific activities that the Chelan County Emergency Management Council and its member organizations can undertake to reduce risk and prevent loss from drought. Each action item is followed by ideas for implementation, which can be used by the Chelan County Emergency Management Council and local decision makers in pursuing strategies for implementation.

Priority 1. Develop drought contingency plans at watershed level

- Identify key personnel and planning committee to develop drought contingency plan
- Identify alternative water sources
- Develop water conservation measures that can be implemented
- Evaluate priority uses of water in critical areas

Lead Agency: Chelan County Emergency Management (Sheriff), Chelan County Natural Resource Department

Timeline: 2 years

Plan Goals Addressed: Protect People, Economy, Emergency Services, Education, Partnerships

Benefit Cost Score: 1

Priority Score: 55

Potential Funding Source: Funding could be obtained through local budget or grants.

Priority 2. Develop drought public education programs

- Encourage understanding of water conservation measures
- Develop in-home water supply programs

Lead Agency: Chelan County Emergency Management (Sheriff), Chelan County Natural Resource Department, Chelan County Cooperative Extension

Timeline: Ongoing

Plan Goals Addressed: Protect People, Economy, Emergency Services, Education, Partnerships

Benefit Cost Score: 2

Priority Score: 55

Potential Funding Source: Funding could be obtained through local budget or grants.

Wildfire Hazard Mitigation Action Items

The wildfire mitigation action items provide direction on specific activities that the Chelan County Emergency Management Council and its member organizations can undertake to reduce risk and prevent loss from wildfire events. Each action item is followed by ideas for implementation, which can be used by the Chelan County Emergency Management Council and local decision makers in pursuing strategies for implementation. Since the 2004 plan adoption, Community Wildfire Plans have been developed Countywide, in close coordination with local fire districts, and are now in the early phases of implementation.

Priority 1. Reduce risk of wildfire hazards and damage through implementation of wildfire prevention and mitigation activities

- Implement Firewise-type programs in wildland/urban interface areas
- Employ mechanical thinning and prescribed burning to abate the risk of catastrophic fire and restore the more natural regime of high frequency, low-intensity burns. Prescribed burning can provide benefit to ecosystems by thinning hazardous vegetation and restoring ecological diversity to areas homogenized by invasive plants
- Clear trimmings, trees, brush, and other debris completely from sites when performing routine maintenance and landscaping to reduce fire risk
- Encourage single-family residences to have fire plans and practice evacuation routes
- Encourage fire inspections in residential homes by fire departments to increase awareness among homeowners and potential fire responders
- Encourage the public to evaluate access routes to rural homes for fire-fighting vehicles and to develop passable routes if they do not exist

Lead Agency: Chelan County Emergency Management (Sheriff), Chelan County Planning, City Planning, Cascadia Conservation District

Timeline: Ongoing

Plan Goals Addressed: Protect People, Property, Economy, Environment, Emergency Services, Education, Partnerships

Benefit Cost Score: 1

Priority Score: 85

Potential Funding Source: Funding could be obtained through local budget or grants.

Priority 2. Evaluate building and construction techniques for efficiency in preventing wildfire damage, particularly roofing requirements

- Encourage local zoning and planning entities to work closely with landowners and/or developers who choose to build in the wildland/urban interface to identify and mitigate conditions that aggravate wildland/urban interface wildfire hazards, including:
 - Limited access for emergency equipment due to width and grade of roadways;
 - Inadequate water supplies and the spacing, consistency, and species of vegetation around structures

- Inadequate fuel breaks, or lack of defensible space
- Highly flammable construction materials
- Inadequate entry/escape routes
- Encourage all new homes and major remodels involving roofs or additions that are located in the interface to have fire resistant roofs and residential sprinkler systems

Lead Agency: Chelan County Planning, City Planning

Timeline: Ongoing

Plan Goals Addressed: Protect People, Property, Economy, Environment, Emergency Services, Education, Partnerships

Benefit Cost Score: 2

Priority Score: 80

Potential Funding Source: Funding could be obtained through local budget

Priority 3. Enhance outreach and education programs aimed at mitigating wildfire hazards and reducing or preventing the exposure of citizens, public agencies, private property owners, and businesses to natural hazards

- Encourage the hiring of fire prevention and education personnel to oversee education programs
- Visit urban interface neighborhoods and rural areas and conduct education and outreach activities
- Conduct specific community-based demonstration projects of fire prevention and mitigation in the urban interface, including creation of “safe zones” around homes
- Establish neighborhood “drive-through” activities that pinpoint site-specific mitigation activities. Fire crews can give property owners personal suggestions and assistance
- Perform public outreach and information activities at Chelan County fire stations by creating “Wildfire Awareness Week” activities. Fire stations can hold open houses and allow the public to visit, see the equipment, and discuss wildfire mitigation with the station crews

Lead Agency: Chelan County Emergency Management (Sheriff)

Timeline: Ongoing

Plan Goals Addressed: Protect People, Property, Economy, Emergency Services, Education, Partnerships

Benefit Cost Score: 2

Priority Score: 75

Potential Funding Source: Funding could be obtained through local budget or grants.

Priority 4. Encourage development and dissemination of maps relating to the fire hazard to help educate and assist builders and homeowners in being engaged in wildfire mitigation activities, and to help guide emergency services during response

- Develop wildland/urban interface maps

- Conduct risk analysis incorporating data and the created hazard maps using GIS technology to identify risk sites and further assist in prioritizing mitigation activities

Lead Agency: Chelan County Emergency Management (Sheriff), Chelan County Planning, City Planning

Timeline: 1-3 years

Plan Goals Addressed: Protect Property, Environment, Emergency Services, Education, Partnerships

Benefit Cost Score: 2

Priority Score: 45

Potential Funding Source: Funding could be obtained through local budget or grants.

Avalanche Hazard Mitigation Action Items

The avalanche mitigation action items provide direction on specific activities that the Chelan County Emergency Management Council and its member organizations can undertake to reduce risk and prevent loss from avalanches. Each action item is followed by ideas for implementation, which can be used by the Chelan County Emergency Management Council and local decision makers in pursuing strategies for implementation.

Priority 1. Collaborate with Washington Department of Transportation and others to identify avalanche-prone transportation routes and identify alternative transportation routes

Lead Agency: Chelan County Emergency Management (Sheriff)

Timeline: 2 years

Plan Goals Addressed: Protect People, Economy, Emergency Services, Education, Partnerships

Benefit Cost Score: 2

Priority Score: 55

Potential Funding Source: Funding could be obtained through local budget or grants.

Priority 2. Educate backcountry users on location and dangers of avalanche-prone areas

Lead Agency: Chelan County Emergency Management (Sheriff)

Timeline: Ongoing

Plan Goals Addressed: Protect People, Emergency Services, Education, Partnerships

Benefit Cost Score: 2

Priority Score: 40

Potential Funding Source: Funding could be obtained through local budget or grants.

Jurisdiction-Specific Natural Hazard Sub-Plans

Overview

In addition to the risk assessments and mitigation strategy that apply County-wide, individual jurisdictions (Cashmere, Chelan, Entiat, Leavenworth, and Wenatchee) developed their own Sub-Plans that contain information specific to their jurisdiction, including the following:

1. Contact information
2. Land use trends
3. Utility services
4. Transportation services
5. Critical facilities
6. Hazard risk and vulnerability
7. Rationale for hazard risk and vulnerability ratings
8. High priority mitigation actions

These jurisdictions established their respective hazards and hazard rankings based on internal evaluations and consideration of resources expended responding to natural hazard events, historic occurrence of natural hazards and city resident concerns related to natural hazards. With the exception of the City of Wenatchee, all jurisdictions are very small cities with a population of less than 5,000, and determining the location and extent of natural hazards is a relatively straightforward exercise. The City of Wenatchee occupies a much larger geographic area than the other cities and has likewise completed a more detailed analysis of hazard location and extent. As noted in the plan, the City of Wenatchee also serves as a regional hub for natural disaster event emergency response and coordination.

Additionally, the Chelan County Unincorporated Areas Sub-Plan contains detailed information on these areas as well and also contains information on the multitude of infrastructure and services available to residents of the County. These infrastructure and services play a key role in hazard mitigation planning as they define the communities' assets that are critical to hazard planning and vital in surviving a natural disaster.

City of Cashmere

Natural Hazard Mitigation Sub-Plan

Overview

The City of Cashmere, in partnership with members of the Chelan County Emergency Management Council, has been an active participant in the development of the Chelan County Natural Hazard Mitigation Plan. The county-wide plan reflects the hazards, vulnerabilities, and mitigation actions most likely to affect the citizens of Chelan County. The City of Cashmere Natural Hazard Mitigation Sub-Plan builds on the County-wide plan and further delineates the unique hazards, vulnerabilities, and mitigation actions specific to the City. Mitigation actions identified in the County-wide plan and this sub-plan are, in many cases, equally appropriate for the City to consider for implementation.

Straightforward, simplified technical analyses were used for tasks such as estimating property values, determining the size of populations affected, and so forth. The reliance on the judgment of knowledgeable officials and simplified analyses is considered acceptable at this stage of the hazard mitigation planning process to allow the participating organizations to complete the tasks needed to develop the multi-jurisdictional Natural Hazards Mitigation Plan. As hazard mitigation planning continues and mitigation actions are proposed for funding and implementation, the participating organizations and jurisdictions recognize that additional information and analyses may be required.

The information below includes a jurisdictional profile of the City, natural hazard risks to the people and property of the City, and high-priority mitigation actions that could be implemented to reduce damage from catastrophic events.

Contact Information:

Mayor Gordon Irle
Mayor of Cashmere

Mark Botello
Director of Planning & Building

Bob Schmidt
Director of Operations

Kay Jones
Clerk/Treasurer

101 Woodring Street
Cashmere, WA 98815
Telephone: (509) 782-3513

Population of Jurisdiction:

Approximately 3,005

Estimated Geographical Size:

2 square miles

Principal Economic Base:

Cashmere is primarily a residential community with a large percentage of the population commuting to

Economic Characteristic:**Predominant neighborhood types:****Approximate number of structures:****Estimated average value:**

Wenatchee for employment. The relatively low amount of commercial and industrial property means few local opportunities for employment within City limits.

Average for the State

Commercial/retail, residential, Warehouse industrial
1,200

\$182,249 (at 2.5% estimated average value increase)

Land Use Trends

The City anticipates a decline in agricultural land use, modest gains in mixed light commercial and industrial land uses, and an increase in residential and multi-family land uses. The City estimates that by 2023 there will be no vacant or unused land within the City limits. In general, development trends for the City of Cashmere indicate that currently 10% of the jurisdiction is still open for development, development is occurring rapidly and somewhat faster than planned, and expansion, redevelopment, and/or construction is occurring to some properties in a few locations. Table I illustrates the anticipated change in land uses in the City of Cashmere.

Table I: City of Cashmere Land Uses

<i>Type of Land Use</i>	<i>Acres Current (2009)</i>	<i>Percent of Total Current (2009)</i>	<i>Acres Future (2023)</i>	<i>Percent of Total Future (2023)</i>
Single Family Residential	414	51%	515	59%
Multi Family Residential	27	3%	45	6%
Commercial	36	4%	55	6%
Industrial	60	7%	70	7%
Public	135	16%	135	16%
Agriculture	49	6%	15	2%
Vacant	97	12%	45	6%
Total	818	100%	880	100%

Neighborhoods

The City of Cashmere, despite its small population base, has identified six distinct neighborhood areas within its limits. Additionally, each neighborhood has been assessed for its vulnerability to identified hazards.

Neighborhood:	Skyline Drive/ Tigner Road		
Type:	Residential		
Number of structures:	300		
	Average value:	\$182,249	
Structure type:	Wood frame		
Population:	700		
Critical facilities:	Critical employer, evacuation route, religious facility, school		

Neighborhood:	West Cashmere (Sunset Highway)
Type:	Residential, Commercial and Industrial
Number of structures:	200
	Average value: \$182,249
Structure type:	Wood frame
Population:	525
Critical facilities:	Critical employer, evacuation route, religious facility, school

Neighborhood:	East Cashmere, (Cotlets Ave/Titchenal Way/Riverfront Drive)
Type:	Residential, Commercial and Industrial
Number of structures:	53
	Average value: \$182,249
Structure type:	Wood frame and Concrete
Population:	40
Critical facilities:	Critical employer, critical supplier, evacuation route, museum, public works facility, sewer system facility, water system facility

Neighborhood:	Pioneer Avenue & Division near Vale Elementary School
Type:	Residential
Number of structures:	100
	Average value: \$182,249
Structure type:	Wood frame
Population:	175
Critical facilities:	Critical employer, assisted living facility, evacuation route, nursing home, religious facility, school

Neighborhood:	Downtown (Cottage Ave./Applets Way/Elberta Ave)
Type:	Residential, retail/commercial
Number of structures:	470
	Average value: \$182,249
Structure type:	Wood frame
Population:	1,100
Critical facilities:	Critical employer, critical supplier, emergency facility, evacuation route, government offices, , library, medical/clinic offices, public works facility, religious facility, transportation center

Neighborhood:	Chase Hill/Olive Street/Valley Street
Type:	Residential
Number of structures:	226

	Average value:	\$182,249
Structure type:	Wood frame	
Population:	500	
Critical facilities:	Emergency facility, evacuation route, government offices, public works facility, religious facility	

Utility and Transportation Service

A general overview of utility and transportation services available to the City was completed. Utility and transportation services are typically the first line of defense in responding to natural disasters, and an understanding of critical vulnerabilities in these areas aids in the development of potential pre-disaster mitigation actions. There are a variety of utility and transportation services in the City as outlined in Tables II and III.

Table II: Utility services available

Category	Type	Availability
Power	Above grade electric	Yes
Power	Below grade electric	Yes
Water	Two (2) Community system	Yes
Water	Individual water wells	Yes
Sewer	Community sewer	Yes
Sewer	Individual septic	Yes
Phone	Above grade telephone	Yes
Phone	Below grade telephone	Yes
Communications	Commercial TV and radio	Yes
Communications	Cable TV	Yes
Gas	Natural gas pipeline	No
Gas	Propane/LPG	No

Table III: Transportation service available

Category	Type	Availability
Access	Multiple roadway access	Yes
Access	Single road way access	Yes
Access	No direct roadway access	No
Access	Access by boat/plane only	No
Mobility	Depend on private vehicles	Yes
Mobility	Depend on private transit	Yes
Mobility	Limited to foot/boat/plane	No

Critical Facilities

An important aspect of natural hazard mitigation planning is identifying facilities or system components in the community whose presence or operation are “critical” or “vital” to the safety and welfare of the community. As part of the planning process, information is needed regarding the location, operation and basic vulnerability of these critical facilities for use in the planning process.

The City of Cashmere is a community with all of the critical facilities typical of a healthy small city. The list of critical facilities below identifies and documents fundamental information about these facilities; their location and ownership; and their function. The list also addresses if the facility or system has standby electrical power or if there may be difficulties with access and egress at the time of a disaster. Table IV shows the types of critical facilities within the City, while the following list details some of these facilities.

Table IV: Critical facilities present in the City of Cashmere

Assisted living facility	Yes	Medical offices/clinic	Yes
Critical employer	Yes	Museum/Cultural center	Yes
Critical supplier/store	Yes	Nursing Home/Rehab	Yes
Emergency facility	Yes	Public works facility	Yes
Energy facility-Substations	Yes	Religious facility	Yes
EOC	Yes	Repetitive loss properties	No
Evacuation route	Yes	School	Yes
Government offices	Yes	Sewer system facility	Yes
HazMat facility	No	Transportation center	No
Hospital	No	Water system facility	Yes
Library	Yes		

List of Critical Facilities:

Chelan County Public Utilities District (PUD) Electrical Substations

Simmer Substation (River Street, Cashmere, WA. 98815) Jarvis Substation (River Front Drive, Cashmere, WA. 98815)

Blue Star Substation (100 Blue Star Way, Cashmere, WA. 98815)

Evergreen Substation (Pioneer Avenue, Cashmere, WA. 98815)

Adequate standby power: Yes

Access limitations: Snow and ice

City of Cashmere Wastewater Lift Stations

Riverfront Drive

Cashmere, WA 98815

Adequate standby power: No

Access limitations: Heavy rainfall, localized flooding

City of Cashmere Wastewater Lagoons

No Address

Cashmere, WA. 98815

Adequate standby power: No

Access Limitations: One entrance, snow and Ice

City of Cashmere Wells #10 and #4

No address

Cashmere, WA 98815

Adequate standby power: No

Access limitations: None

City of Cashmere Kennedy and Sherman Reservoirs

No address

Cashmere, WA 98815

Adequate standby power: No

Access limitations: Snow and Ice

City of Cashmere Water Treatment Plant

201 Museum Road

Cashmere, WA 98815

Adequate standby power: No

Access limitations: Damage to bridge, culvert, or overpass

Hazard Risk and Vulnerability

The City of Cashmere, because of geographical, geological and topographical diversities, is subject to the wide variety of hazards identified in the County-wide plan; however, some hazards represent a slightly greater risk to the community either in occurrence probability or potential damage. Hazard mitigation analyses conducted by City of Cashmere staff was based on the best currently available information and data regarding the characteristics of the city; the natural hazards that threaten the people, property, and environment of the City; and the impacts the City has suffered in past disasters. A combination of existing hazard documents, particularly the Chelan County Hazard Inventory and Vulnerability Assessment (HIVA), were used and compared to the experience, knowledge and judgment of local officials representing the City to conduct the hazard mitigation analysis. Table V outlines the overall relative ranking of natural hazard risks to the City and an estimate of the population at risk by the hazard. While Cashmere is an NFIP participant, there are no RL properties within the jurisdiction.

Table V: Hazard risk and vulnerability

<i>Hazard</i>	<i>Relative Ranking</i>	<i>Neighborhood Percent at Risk</i>					
		Skyline Dr	West Cashmere , Sunset Highway	Cotelts, Titchenal, Riverfront Drive	Vale and Pioneer Ave	Downtown, Cottage, Aplets and Elberta	Chase Ave and Olive St
Drought	3	25	50	25	25	25	25
Earthquake	4	0	0	0	0	0	0
Flooding	2	0	25	25	25	0	0
Landslide	7	0	0	0	0	0	0
Wildland Fire	6	25	25	25	25	25	25
Severe Storm	1	25	25	25	25	25	25
Avalanche	8	0	0	0	0	0	0
Volcanic Activity	5	0	0	0	0	0	0

Rationale for Hazard Risk and Vulnerability Ratings*Probability of Future Occurrence*

Portions of all neighborhoods within the City of Cashmere are at risk annually from severe storms, primarily snow storms during January and February. Localized flooding occurs along Mission and Brender Creeks during late fall rain-on-snow events and during spring run-off, although the City of Cashmere does not have any RL properties. While drought declarations by the State of Washington occur once every 10-15 years, the city is served by reliable municipal wells and irrigation districts with high-altitude mountain reservoirs in the Alpine Lakes Wilderness that have consistently re-filled in their 100-plus year history. There is no history of significant earthquake damage within the city or volcanic activity. The topography of the city is primarily flat and unaffected by landslides. While wildland fires primarily occur on surrounding County lands, a number of neighborhoods could be affected. Orchards surround the city on the north and west and provide a buffer from wildland fires.

Impacts

Primary impacts to the City of Cashmere from natural hazard events are from severe winter storms and localized flooding. While some structural damage to older buildings from snow accumulation occurs, the primary impact is economic. Residents may not be able to travel to work, elderly residents may be at risk from loss of heat, and schools may be closed. Many residents work in Wenatchee, approximately 15 miles away, and travel to Wenatchee may be dangerous during a severe winter storm. Localized flooding primarily affects landscaping with very little structural damage. The City of Cashmere is protected on the east from the Wenatchee River by a levee. Impacts from drought are expected to be negligible due to secure and reliable water supplies. Earthquake and

volcanic activity impacts are also expected to be negligible due to their low probability of occurrence and flat terrain. Wildland fire impacts will be highly localized, and there would be no impacts from landslides due to the flat topography within the city limits.

Value of Resources at Risk

While it is difficult to estimate losses to the city from natural hazard events, they can be broadly described. Structures affected by severe winter storms would be primarily residential or older commercial buildings but relatively minor in nature. It would be difficult to estimate economic losses from winter storms. Losses from wildland fire would be primarily to residential areas and would be minor in nature. While drought may affect portions of the city, reliable water supplies keep losses at a minimum.

High Priority Natural Hazard Mitigation Actions

Based on the hazard risk and vulnerability specific to the City and the County-wide natural hazard mitigation planning effort, the City has identified the following high-priority mitigation actions specific to the City of Cashmere. The City stresses that mitigation actions identified in the County-wide plan are equally appropriate for the City to consider, particularly multi-hazard mitigation actions.

Earthquake

Priority 1. Retrofit existing critical facilities (i.e. hospitals, schools, etc.) in each community to ensure compliance with current building codes so the facilities are safe following earthquakes

Priority 2. Adoption of International Building Codes with adherence to Chelan County's recognized earthquake zone

Severe Storms

Priority 1. Implement a public notification system to alert the public to severe storm activity

Wildfire

Priority 1. Provide classes to homeowners in the urban/wildland interface zones on maintaining "safe zones" around their homes, particularly along the southern and western areas of the city

Priority 2. Adopt regulations requiring metal roofs on structures in urban/wildland interface zones

Flooding

Priority 1. Raise existing homes above the floodplain and evaluate sewage treatment pond for flooding potential

Priority 2. Evaluate critical facilities along Wenatchee River and Mission Creek for flooding potential and evaluate mitigation actions

Priority 2. Adopt the State's Model Floodplain Ordinance to prohibit/regulate future development in the floodplain

Priority 3. Continue to work with FEMA and DOE on flood zone management.

Priority 4. Require flood insurance for structures built within the flood zone.

Multi-Hazard Mitigation

Priority 1. Identify and stock emergency shelters (including schools in the event students are unable to return home due to a storm) in each community to provide housing during severe storms

Priority 2. Schedule and implement Emergency Response Planning, including table-top exercises

Priority 3. Public Education/Community Preparedness Classes to teach neighborhoods to be self-reliant for three days following a disaster

City of Chelan

Natural Hazard Mitigation Sub-Plan

Overview

The City of Chelan, in partnership with members of the Chelan County Emergency Management Council, has been an active participant in the development of the Chelan County Natural Hazards Mitigation Plan. The county-wide plan reflects the hazards, vulnerabilities, and mitigation actions most likely to affect the citizens of Chelan County. The City of Chelan Natural Hazard Mitigation Sub-Plan builds on the County-wide plan and further delineates the unique hazards, vulnerabilities, and mitigation actions specific to the City. Mitigation actions identified in the County-wide plan and this sub-plan are, in many cases, equally appropriate for the City to consider for implementation.

Straightforward, simplified technical analyses were used for tasks such as estimating property values, determining the size of populations affected, and so forth. The reliance on the judgment of knowledgeable officials and simplified analyses is considered acceptable at this stage of the hazard mitigation planning process to allow the participating organizations to complete the tasks needed to develop the multi-jurisdictional natural hazards mitigation plan. As hazard mitigation planning continues and mitigation actions are proposed for funding and implementation, the participating organizations and jurisdictions recognize that additional information and analyses may be required.

The information below includes a jurisdictional profile of the City, natural hazard risks to the people and property of the City, and high-priority mitigation actions that could be implemented to reduce damage from catastrophic events.

Contact Information:

Craig Gildroy
Community Development Director
Chelan, WA 98816
Telephone: (509) 682-8017

Population of Jurisdiction:

4010 and increasing slightly

Estimated Geographical Size:

6.11 square miles (UGA 8.2 square miles)

Principal Economic Base:

Recreation and Tourism

Economic Characteristic:

Average for the State

Predominant neighborhood types:

Commercial/retail, residential

Approximate number of structures:

2260

Estimated average value:

\$300,000

Land Use Trends

The City anticipates few changes in its land use mixture or patterns over the next twenty years. The City has approved a commercial / industrial planned development known as Apple Blossom. Currently a single large, 172,000 square foot, retail tenant is located within this 200 acre development. Two community facilities have secured property within Apple Blossom Center. The Lake Chelan Community Hospital has plans to locate a new regional facility and

the Chelan School District has a future school complex planned for the area. The City expects additional commercial growth to occur within Apple Blossom Center and the downtown core. A Downtown Master Plan is expected to be adopted in 2010.

In general, development trends for the City of Chelan indicate that 35% of the jurisdiction is still open for development. Very little re-development is occurring. The City has adopted a new housing manual to encourage infill development within the downtown residential neighborhoods. The City population average growth, 2000-2008, is 1.66% per year. The City expects the growth rate to be around 1% per year with an over the age of 60 growth rate to be around 2.8%.

The majority of new residential units have been single family residential; however over the last four years, the City has seen an increase in larger (over 40 units) multi-family buildings being developed. The majority of these larger multi-family complexes are flexible ownership such as time share.

Table I illustrates the anticipated change in land uses in the City of Chelan.

Table I: City of Chelan Land Uses

<i>Land Use Category</i>	<i>Current (2009)</i>	<i>Future (2029)</i>
Agricultural		
Commercial	10%	15%
Developed with mixed uses	5%	5%
Industrial	15%	10%
Institutional (education, health care, etc.)	5%	5%
Parks/restricted wild land/wildlife refuge		
Residential	55%	55%
Transportation or utility right-of-way		
Vacant/unused-government ownership		
Vacant/unused-private ownership		
Waterway/lake/wetland		
Other land use	5%	5%

Utility and Transportation Service

A general overview of utility and transportation services available to the City was completed. Utility and transportation services are typically the first line of defense in responding to natural disasters, and an understanding of critical vulnerabilities in these areas aids in the development of potential pre-disaster mitigation actions. There are a variety of utility and transportation services in the City as outlined in Tables II and III.

Table II: Utility services available

Category	Type	Availability
Power	Above grade electric	Yes
Power	Below grade electric	Yes
Water	Community system	Yes
Water	Individual water well	Yes
Sewer	Community sewer	Yes
Sewer	Individual septic	Yes
Phone	Above grade telephone	Yes
Phone	Below grade telephone	Yes
Communications	Commercial TV and radio	Yes
Communications	Cable TV	Yes
Gas	Natural gas pipeline	No
Gas	Propane/LPG	Yes

Table III: Transportation service available

Category	Type	Availability
Access	Multiple roadway access	Yes
Access	Single road way access	Yes
Access	No direct roadway access	No
Access	Access by boat/plane only	No
Mobility	Depend on private vehicles	Yes
Mobility	Depend on private transit	Yes
Mobility	Limited to foot/boat/plane	No

Critical Facilities

An important aspect of natural hazard mitigation planning is identifying facilities or system components in the community whose presence or operation are “critical” or “vital” to the safety

and welfare of the community. As part of the planning process, information is needed regarding the location, operation and basic vulnerability of these critical facilities for use in the planning process.

The City of Chelan is a thriving community with all of the critical facilities typical of a healthy small city. The list of critical facilities below identifies and documents fundamental information about these facilities; their location and ownership; and their function. The list also addresses if the facility or system has standby electrical power or if there may be difficulties with access and egress at the time of a disaster. Table IV shows the types of critical facilities within the City, while the following list details these facilities.

Table IV: Critical facilities present in the City of Chelan

Assisted living facility	Yes	Medical offices	Yes
Critical employer	Yes	Museum/Cultural center	Yes
Critical supplier/store	Yes	Nursing Home/Rehab	Yes
Emergency facility	Yes	Public works facility	Yes
Energy facility	Yes	Religious facility	Yes
EOC	Yes	Repetitive loss properties	No
Evacuation route	Yes	School	Yes
Government offices	Yes	Sewer system facility	Yes
HazMat facility	No	Transportation center	No
Hospital	Yes	Water system facility	Yes
Library	Yes		

List of Critical Facilities:

City of Chelan Water and Wastewater Plants

Chelan, WA 98816

Adequate standby power: Yes

Access limitations: Damage to bridge, culvert, or overpass; snow and ice

City of Chelan City Hall

135 E. Johnson Avenue

Chelan, WA 98816

Adequate standby power: No

Access limitations: Damage to bridge, culvert, or overpass; snow and ice

Chelan High School

210 Webster

Chelan, WA 98816

Adequate standby power: Yes

Access limitations: Damage to bridge, culvert, or overpass; snow and ice

Water supply (surface water)

Chelan, WA 98816

Adequate standby power: Yes

Access limitations: Damage to bridge, culvert, or overpass; snow and ice; heavy rainfall, flooding

Hazard Risk and Vulnerability

The City of Chelan, because of geographical, geological and topographical diversities, is subject to the wide variety of hazards identified in the County-wide plan; however, some hazards represent a slightly greater risk to the community either in occurrence probability or potential damage. Hazard mitigation analyses conducted by City of Chelan staff was based on the best currently available information and data regarding the characteristics of the city; the natural hazards that threaten the people, property, and environment of the City; and the impacts the City has suffered in past disasters. A combination of existing hazard documents, particularly the Chelan County Hazard Inventory and Vulnerability Assessment (HIVA), were used and compared to the experience, knowledge and judgment of local officials representing the City to conduct the hazard mitigation analysis. Table V outlines the overall relative ranking of natural hazard risks to the City and an estimate of the population at risk to the hazard. While Chelan is an NFIP participant, there are no RL properties within the jurisdiction.

Table V: Hazard risk and vulnerability

<i>Hazard</i>	<i>Relative Ranking</i>	<i>Percent at Risk</i>
Drought	7	100
Earthquake	3	100
Flooding	5	5
Landslide	4	10
Wildland Fire	1	25
Severe Storm	2	100
Avalanche	8	5
Volcanic Activity	6	100

Rationale for Hazard Risk and Vulnerability Ratings

Probability of Future Occurrence

Wildland fires can occur in the foothills along the urban growth boundary of the city in several locations. Annually, there are at least minor brush fires in these areas. Portions of all neighborhoods within the City of Chelan are at risk annually from severe storms, primarily snow storms during January and February. Earthquakes are rare, although minor seismic events do occur south of the city along the Columbia River. Landslides could occur in a small portion of the city near Lakeside. Localized flooding occurs in a few neighborhoods. Volcanic activity is extremely rare. The city's water supply is from regulated Lake Chelan and is thus quite reliable, largely negating drought conditions. There are no known avalanche areas within the city with the possible exception of localized landslide-prone areas. It should be noted that the city is primarily flat.

Impacts

Primary impacts to the City of Chelan from natural hazard events are from severe winter storms and wildland fires. While some structural damage to older buildings from snow accumulation occurs, the primary impact is economic. Residents may not be able to travel to work, elderly residents may be at risk from loss of heat, and schools may be closed. Residents who work in Wenatchee, approximately 45 miles away, face a number of challenges during a winter storm. Closure of HWY 97 to the south of Chelan from earthquake would require commuters to travel along the east side of the Columbia River through Douglas County to get to and from Wenatchee. Impacts from other hazards are relatively minor in nature. Earthquake and landslide impacts could include structural damage within localized neighborhoods. Flooding and volcanic activity impacts are expected to be negligible due to the low likelihood of occurrence and lack of threatened areas. Drought impacts are negligible due to the reliable water supply from Lake Chelan, and avalanche impacts would be minimal residential damage in only a few areas of the city.

Value of Resources at Risk

Wildland fires would affect residential neighborhoods along the urban growth boundary, but perhaps the greatest risk from wildland fires is the economic impact to the tourism industry during the summer. Lake Chelan is a large draw for tourism and is the primary economic driver for the area. Due to the city's proximity to the Wenatchee-Okanogan National Forest, wildland fires and the accompanying smoke on USFS-managed lands can have a significantly negative economic impact to the city. Structures affected by severe winter storms would be primarily residential or older commercial buildings but relatively minor in nature. It would be difficult to estimate economic losses from winter storms. While drought may affect portions of the city, reliable water supplies keep losses at a minimum.

High Priority Natural Hazard Mitigation Actions

Based on the hazard risk and vulnerability specific to the City and the County-wide natural hazard mitigation planning effort, the City has identified the following high-priority mitigation actions specific to the City of Chelan. The City stresses that mitigation actions identified in the County-wide plan are equally appropriate for the City to consider, particularly multi-hazard mitigation actions.

Earthquake

Priority 1. Retrofit existing critical facilities (i.e. hospitals, schools, etc.) in each community to ensure compliance with current building codes so the facilities are safe following earthquakes

Priority 2. Develop a transportation evacuation plan

Priority 3. Adoption of International Building Codes with adherence to Chelan County's recognized earthquake zone

Severe Storms

Priority 1. Implement a public notification system to alert the public to severe storm activity

Wildfire

Priority 1. Provide classes to homeowners in the urban / wildland interface zones on maintaining "safe zones" around their homes. Focus on northern section of city near rodeo grounds.

Priority 2. Adopt regulations requiring metal roofs on structures in urban / wildland interface zones

Flooding

Priority 1. Adopt the State's Model Floodplain Ordinance to prohibit / regulate future development in the floodplain

Avalanche

Priority 1. Coordinate with the WSDOT to designate alternate evacuation routes from each community in the event of an avalanche

Multi-Hazard Mitigation

Priority 1. Identify and stock emergency shelters (including schools in the event students are unable to return home due to a storm) in each community to provide housing during severe storms

Priority 2. Schedule and implement Emergency Response Planning, including table-top exercises

Priority 3. Public Education / Community Preparedness Classes to teach neighborhoods to be self-reliant for three days following a disaster

City of Entiat

Natural Hazard Mitigation Sub-Plan

Overview

The City of Entiat, in partnership with members of the Chelan County Emergency Management Council, has been an active participant in the development of the Chelan County Natural Hazards Mitigation Plan. The county-wide plan reflects the hazards, vulnerabilities, and mitigation actions most likely to affect the citizens of Chelan County. The City of Entiat Natural Hazard Mitigation Sub-Plan builds on the County-wide plan and further delineates the unique hazards, vulnerabilities, and mitigation actions specific to the City. Mitigation actions identified in the County-wide plan and this sub-plan are, in many cases, equally appropriate for the City to consider for implementation.

Straightforward, simplified technical analyses were used for tasks such as estimating property values, determining the size of populations affected, and so forth. The reliance on the judgment of knowledgeable officials and simplified analyses is considered acceptable at this stage of the hazard mitigation planning process to allow the participating organizations to complete the tasks needed to develop the multi-jurisdictional natural hazards mitigation plan. As hazard mitigation planning continues and mitigation actions are proposed for funding and implementation, the participating organizations and jurisdictions recognize that additional information and analyses may be required.

The information below includes a jurisdictional profile of the City, natural hazard risks to the people and property of the City, and high-priority mitigation actions that could be implemented to reduce damage from catastrophic events.

Contact Information:	Bob Whitehall Public Works Director Entiat, WA 98822 Telephone: (509) 784-1500
Population of Jurisdiction:	1,170 and increasing rapidly
Estimated Geographical Size:	2.00 square miles
Principal Economic Base:	Agricultural/Recreation and Tourism
Economic Characteristic:	Economically Disadvantaged
Predominant neighborhood types:	Commercial/retail, residential, transportation
Approximate number of structures:	480
Estimated average value:	\$140,000

Land Use Trends

The City anticipates a decline in agricultural land use, modest gains in residential land uses, and an increase in commercial land uses. The City estimates that by 2023 there will be no vacant or unused land within the City limits. In general, development trends for the City of Entiat indicate that 38% of the jurisdiction is still open for development. Table I illustrates the anticipated change in land uses in the City of Entiat. Future land use percentages are based on

designations and include vacant land and infrastructure.

Table I: City of Entiat Land Uses

<i>Land Use Category</i>	<i>Current (2009)</i>	<i>Future (2023)</i>
Agricultural	21.1%	5%
Commercial	1.5%	20%
Developed with mixed uses		
Industrial	2.2%	0%
Institutional (education, health care, etc.)		
Parks/restricted wild land/wildlife refuge	10%	15%
Residential	22%	52%
Transportation or utility right-of-way	1%	2%
Vacant/unused-government ownership	4.5%	1%
Vacant/unused-private ownership	37.7%	5%
Waterway/lake/wetland		
Other land use	0%	

Utility and Transportation Service

A general overview of utility and transportation services available to the City was completed. Utility and transportation services are typically the first line of defense in responding to natural disasters, and an understanding of critical vulnerabilities in these areas aids in the development of potential pre-disaster mitigation actions. There are a variety of utility and transportation services in the City as outlined in Tables II and III.

Table II: Utility services available

Category	Type	Availability
Power	Above grade electric	Yes
Power	Below grade electric	Yes
Water	Community system	Yes
Water	Individual water well	Yes
Sewer	Community sewer	Yes
Sewer	Individual septic	Yes
Phone	Above grade telephone	Yes
Phone	Below grade telephone	Yes
Communications	Commercial TV and radio	Yes

Communications	Cable TV	Yes
Gas	Natural gas pipeline	No
Gas	Propane/LPG	No

Table III: Transportation service available

Category	Type	Availability
Access	Multiple roadway access	Yes
Access	Single road way access	Yes
Access	No direct roadway access	No
Access	Access by boat/plane only	No
Mobility	Depend on private vehicles	Yes
Mobility	Depend on private transit	Yes
Mobility	Limited to foot/boat/plane	No

Critical Facilities

An important aspect of natural hazard mitigation planning is identifying facilities or system components in the community whose presence or operation are “critical” or “vital” to the safety and welfare of the community. As part of the planning process, information is needed regarding the location, operation and basic vulnerability of these critical facilities for use in the planning process.

The City of Entiat is a thriving community with all of the critical facilities typical of a healthy small city. The list of critical facilities below identifies and documents fundamental information about these facilities; their location and ownership; and their function. The list also addresses if the facility or system has standby electrical power or if there may be difficulties with access and egress at the time of a disaster. Table IV shows the types of critical facilities within the City, while the following list details these facilities.

Table IV: Critical facilities present in the City of Entiat

Assisted living facility	Yes	Medical offices	No
Critical employer	Yes	Museum/Cultural center	No
Critical supplier/store	Yes	Nursing Home/Rehab	No
Emergency facility	Yes	Public works facility	Yes
Energy facility	Yes	Religious facility	Yes
EOC	Yes	Repetitive loss properties	No
Evacuation route	Yes	School	Yes
Government offices	Yes	Sewer system facility	Yes

HazMat facility	No	Transportation center	No
Hospital	No	Water system facility	Yes
Library	Yes	Tent/RV Park	Yes

List of Critical Facilities: [Check adequate standby power status]

City of Entiat Water and Wastewater Plants

Lakeshore Drive

Entiat, WA 98822

Adequate standby power: Yes

Access limitations: Damage to bridge, culvert, or overpass; snow and ice

City of Entiat City Hall

700 Highway 2

Entiat, WA 98826

Adequate standby power: No

Access limitations: Damage to HWY 97A bridge; snow and ice; rock slides

Entiat High School

Entiat, WA 98822

Adequate standby power: No

Access limitations: Damage to bridge, culvert, or overpass; snow and ice

Water supply (wells) and sewer system

Entiat, WA 98822

Adequate standby power:

Access limitations: Damage to bridge, culvert, or overpass; snow and ice; heavy rainfall, flooding

Hazard Risk and Vulnerability

The City of Entiat, because of geographical, geological and topographical diversities, is subject to the wide variety of hazards identified in the County-wide plan; however, some hazards represent a slightly greater risk to the community either in occurrence probability or potential damage. Hazard mitigation analyses conducted by City of Entiat staff was based on the best currently available information and data regarding the characteristics of the city; the natural hazards that threaten the people, property, and environment of the City; and the impacts the City has suffered in past disasters. A combination of existing hazard documents, particularly the Chelan County Hazard Inventory and Vulnerability Assessment (HIVA), were used and compared to the experience, knowledge and judgment of local officials representing the City to conduct the hazard mitigation analysis. Table V outlines the overall relative ranking of natural hazard risks to the City and an estimate of the population at risk to the hazard. While Entiat is an NFIP participant, there are no RL properties within the jurisdiction.

Table V: Hazard risk and vulnerability

<i>Hazard</i>	<i>Relative Ranking</i>	<i>Percent at Risk</i>
Drought	6	100
Earthquake	1	100
Flooding	7	5
Landslide	4	10
Wildland Fire	5	25
Severe Storm	2	100
Avalanche	8	5
Volcanic Activity	3	100

Rationale for Hazard Risk and Vulnerability Ratings

Probability of Future Occurrence

Minor earthquakes occur both north and south of Entiat on a somewhat regular basis, and major events tend to occur every 10-20 years. Additionally, preventative measures taken by WA Department of Transportation to reduce the risk of rock fall along HWY 97A regularly interrupts transportation services north to Chelan and south to Wenatchee. Portions of all neighborhoods within the City of Entiat are at risk annually from severe storms, primarily snow storms during January and February. Volcanic activity is rare and landslides within the city are non-existent due to flat topography. The city is at low risk from wildland fires due to its location below tree line and proximity to the Columbia River. Drought occurs as in other parts of the County, although impacts are minor due to the city's reliable water supply from the Columbia River. Flooding does not affect the city since there are few drainages within city limits and the Columbia River is regulated by Rocky Reach Dam. There are little to no avalanche areas within the city

Impacts

The City of Entiat is particularly vulnerable to the closure of HWY 97A by earthquake, avalanche, or other natural disaster due to its location along the Columbia River. Access to emergency facilities would be seriously compromised if HWY 97A were to close both above and below the City of Entiat. Other impacts to the city would be from severe winter storms, during which residents may not be able to travel to work, elderly residents may be at risk from loss of heat, and schools may be closed. Many residents work in Wenatchee, approximately 25 miles away, and travel to Wenatchee may be dangerous during a severe winter storm. Impacts from volcanic activity could include closure of HWY 97A due to poor visibility and would affect travel to and from Wenatchee. Landslides and wildland fires could affect some residential neighborhoods within the city and the urban growth boundary. Drought impacts would be negligible due to the highly reliable water supply. Flooding impacts could include some localized residential impacts, and avalanche impacts could affect a few neighborhoods on the western edge of the city.

Value of Resources at Risk

While structural losses in the City of Entiat from the high-priority risks (earthquake, severe storms, volcanic activity) could be minimal, the economic impacts could be great. As already stated, due to the geographic location of Entiat and likelihood of isolation caused by a significant event, economic losses and threats to life safety could be significant. City residents who work outside the city would likely be unable to get to work, access to medical services could be limited, and, depending on the length of the event, resource shortages could occur.

High Priority Natural Hazard Mitigation Actions

Based on the hazard risk and vulnerability specific to the City and the County-wide natural hazard mitigation planning effort, the City has identified the following high-priority mitigation actions specific to the City of Entiat. The City stresses that mitigation actions identified in the County-wide plan are equally appropriate for the City to consider, particularly multi-hazard mitigation actions.

Earthquake

Priority 1. Retrofit existing critical facilities (i.e. hospitals, schools, etc.) in each community to ensure compliance with current building codes so the facilities are safe following earthquakes

Priority 2. Develop a transportation evacuation plan that includes (1) possible ferrying across Columbia River or (2) evacuation plan through Mills Canyon (summer only)

Priority 3. Adoption of International Building Codes with adherence to Chelan County's recognized earthquake zone

Severe Storms

Priority 1. Implement a public notification system to alert the public to severe storm activity

Priority 2. Develop public education programs regarding severe storms

Wildfire

Priority 1. Provide classes to homeowners in the urban / wildland interface zones on maintaining "safe zones" around their homes

Priority 2. Adopt regulations requiring metal roofs on structures in urban / wildland interface zones

Flooding

Priority 1. Adopt the State's Model Floodplain Ordinance to prohibit / regulate future development in the floodplain

Avalanche

Priority 1. Coordinate with the WSDOT to designate alternate evacuation routes from each community in the event of an avalanche

Multi-Hazard Mitigation

Priority 1. Identify and stock emergency shelters (including schools in the event students are unable to return home due to a storm) in each community to provide housing during severe storms

Priority 2. Schedule and implement Emergency Response Planning, including table-top exercises

Priority 3. Public Education / Community Preparedness Classes to teach neighborhoods to be self-reliant for three days following a disaster

City of Leavenworth

Natural Hazard Mitigation Sub-Plan

Overview

The City of Leavenworth, in partnership with members of the Chelan County Emergency Management Council, has been an active participant in the development of the Chelan County Natural Hazards Mitigation Plan. The county-wide plan reflects the hazards, vulnerabilities, and mitigation actions most likely to affect the citizens of Chelan County. The City of Leavenworth Natural Hazard Mitigation Sub-Plan builds on the County-wide plan and further delineates the unique hazards, vulnerabilities, and mitigation actions specific to the City. Mitigation actions identified in the County-wide plan and this sub-plan are, in many cases, equally appropriate for the City to consider for implementation.

Straightforward, simplified technical analyses were used for tasks such as estimating property values, determining the size of populations affected, and so forth. The reliance on the judgment of knowledgeable officials and simplified analyses is considered acceptable at this stage of the hazard mitigation planning process to allow the participating organizations to complete the tasks needed to develop the multi-jurisdictional natural hazards mitigation plan. As hazard mitigation planning continues and mitigation actions are proposed for funding and implementation, the participating organizations and jurisdictions recognize that additional information and analyses may be required.

The information below includes a jurisdictional profile of the City, natural hazard risks to the people and property of the City, and high-priority mitigation actions that could be implemented to reduce damage from catastrophic events.

Contact Information:	Joel Walinski, City Administrator Leavenworth, WA 98826 Telephone: (509) 548-5275
Population of Jurisdiction:	2,300 and increasing slightly
Estimated Geographical Size:	1.00 square mile
Principal Economic Base:	Recreation and Tourism
Economic Characteristic:	Average for the State
Predominant neighborhood types:	Commercial/retail, residential, transportation
Approximate number of structures:	600
Estimated average value:	\$250,000

Land Use Trends

The City anticipates a decline in agricultural land use, modest gains in commercial and industrial land uses, and an increase in residential land uses. The City estimates that by 2023 there will be no vacant or unused land within the City limits. In general, development trends for the City of Leavenworth indicate that 10% of the jurisdiction is still open for development, development is occurring rapidly and somewhat faster than planned, and expansion, redevelopment, and/or construction is occurring to some properties in a few locations. Table I

illustrates the anticipated change in land uses in the City of Leavenworth.

Table I: City of Leavenworth Land Uses

<i>Land Use Category</i>	<i>Current (2009)</i>	<i>Future (2029)</i>
Agricultural	5%	0%
Commercial	10%	12%
Developed with mixed uses	4%	2%
Industrial	1%	3%
Institutional (education, health care, etc.)	1%	1%
Parks/restricted wild land/wildlife refuge	5%	5%
Residential	60%	68%
Transportation or utility right-of-way	7%	7%
Vacant/unused-government ownership	0%	0%
Vacant/unused-private ownership	5%	0%
Waterway/lake/wetland	2%	2%
Other land use	0%	0%

Utility and Transportation Service

A general overview of utility and transportation services available to the City was completed. Utility and transportation services are typically the first line of defense in responding to natural disasters, and an understanding of critical vulnerabilities in these areas aids in the development of potential pre-disaster mitigation actions. There are a variety of utility and transportation services in the City as outlined in Tables II and III.

Table II: Utility services available

Category	Type	Availability
Power	Above grade electric	Yes
Power	Below grade electric	Yes
Water	Community system	Yes
Water	Individual water well	Yes
Sewer	Community sewer	Yes
Sewer	Individual septic	Yes
Phone	Above grade telephone	Yes
Phone	Below grade telephone	Yes
Communications	Commercial TV and radio	Yes
Communications	Cable TV	Yes

Gas	Natural gas pipeline	No
Gas	Propane/LPG	No

Table III: Transportation service available

Category	Type	Availability
Access	Multiple roadway access	Yes
Access	Single road way access	Yes
Access	No direct roadway access	No
Access	Access by boat/plane only	No
Mobility	Depend on private vehicles	Yes
Mobility	Depend on private transit	Yes
Mobility	Limited to foot/boat/plane	No

Critical Facilities

An important aspect of natural hazard mitigation planning is identifying facilities or system components in the community whose presence or operation are “critical” or “vital” to the safety and welfare of the community. As part of the planning process, information is needed regarding the location, operation and basic vulnerability of these critical facilities for use in the planning process.

The City of Leavenworth is a thriving community with all of the critical facilities typical of a healthy small city. The list of critical facilities below identifies and documents fundamental information about these facilities; their location and ownership; and their function. The list also addresses if the facility or system has standby electrical power or if there may be difficulties with access and egress at the time of a disaster. Table IV shows the types of critical facilities within the City, while the following list details these facilities.

Table IV: Critical facilities present in the City of Leavenworth

Assisted living facility	Yes	Medical offices	Yes
Critical employer	Yes	Museum/Cultural center	Yes
Critical supplier/store	Yes	Nursing Home/Rehab	Yes
Emergency facility	Yes	Public works facility	Yes
Energy facility	No	Religious facility	Yes
EOC	Yes	Repetitive loss properties	No
Evacuation route	Yes	School	Yes
Government offices	Yes	Sewer system facility	Yes
HazMat facility	No	Transportation center	No

Hospital	Yes	Water system facility	Yes
Library	Yes		

List of Critical Facilities:

Chelan County Fire District 3 Station and EOC

Chumstick Highway

Leavenworth, WA 98826

Adequate standby power: Yes

Access limitations: Damage to bridge, culvert, or overpass; snow and ice

City of Leavenworth Public Works Maintenance Shops

1400 Commercial Street

Leavenworth, WA 98826

Adequate standby power: No

Access limitations: Damage to bridge, culvert, or overpass; snow and ice

Cascade Medical Center

817 Commercial Street

Leavenworth, WA 98826

Adequate standby power:

Access limitations: Damage to bridge, culvert, or overpass; snow and ice

Mountain Meadows Assisted Living Facility

320 Park Avenue

Leavenworth, WA 98826

Adequate standby power:

Access limitations: Damage to bridge, culvert, or overpass; snow and ice

City of Leavenworth City Hall

700 Highway 2

Leavenworth, WA 98826

Adequate standby power: No

Access limitations: Damage to bridge, culvert, or overpass; snow and ice

Cascade High School

10190 Chumstick Highway

Leavenworth, WA 98826

Adequate standby power:

Access limitations: Damage to bridge, culvert, or overpass; snow and ice

Icicle River Middle School

10195 Titus Road

Leavenworth, WA 98826

Adequate standby power:

Access limitations: Damage to bridge, culvert, or overpass; snow and ice

Cascade School District

225 Central Street (school) and 330 Evans Street(offices)

Leavenworth, WA 98826

Adequate standby power:

Access limitations: Damage to bridge, culvert, or overpass; snow and ice

Water supply (wells)

Icicle Road (NE end of Wenatchee River bridge)

Leavenworth, WA 98826

Adequate standby power: Yes

Access limitations: Damage to bridge, culvert, or overpass; snow and ice; heavy rainfall, flooding

Water Treatment Plant

7050 Icicle Road

Leavenworth, WA 98826

Adequate standby power: No

Access limitations: Damage to bridge, culvert, or overpass; snow and ice; avalanche, landslide, or erosion

Wastewater Treatment Plant

1400 Commercial Street

Leavenworth, WA 98826

Adequate standby power: Yes

Access limitations: Damage to bridge, culvert, or overpass; snow and ice

Cascade Medical Center/Hospital District 1

817 Commercial Street

Leavenworth, WA 98826

Adequate Standby Power: Yes

Access limitations: Damage to bridge, culvert, or overpass; snow and ice

Upper Valley Museum/Audubon Center

347 Division Street

Leavenworth, WA 98826

Adequate Standby Power: No

Access limitations: No handicapped access except in basement

Hazard Risk and Vulnerability

The City of Leavenworth, because of geographical, geological and topographical diversities, is subject to the wide variety of hazards identified in the County-wide plan; however, some hazards represent a slightly greater risk to the community either in occurrence probability or potential damage. Hazard mitigation analyses conducted by City of Leavenworth staff was based on the best currently available information and data regarding the characteristics of the city; the natural hazards that threaten the people, property, and environment of the City; and the

impacts the City has suffered in past disasters. A combination of existing hazard documents, particularly the Chelan County Hazard Inventory and Vulnerability Assessment (HIVA), were used and compared to the experience, knowledge and judgment of local officials representing the City to conduct the hazard mitigation analysis. Table V outlines the overall relative ranking of natural hazard risks to the City and an estimate of the population at risk to the hazard. While Leavenworth is an NFIP participant, there are no RL properties within the jurisdiction.

Table V: Hazard risk and vulnerability

<i>Hazard</i>	<i>Relative Ranking</i>	<i>Percent at Risk</i>
Drought	5	100
Earthquake	2	100
Flooding	6	5
Landslide	7	10
Wildland Fire	1	25
Severe Storm	3	100
Avalanche	8	5
Volcanic Activity	4	100

Rationale for Hazard Risk and Vulnerability Ratings

Probability of Future Occurrence

The City of Leavenworth is surrounded on all sides by forested areas and will continue to experience wildland fires, particularly as the city expands into the urban growth boundary and further into forested areas. The city will continue to be affected by earthquakes which could have a significant impact on residences along the city's edge near more mountainous areas. Due to its proximity to the eastern edge of the Cascades, the city receives a significant amount of winter snow and is at risk annually from severe storms. The mainstem Wenatchee River runs along the city's southern boundary, and low-lying parks are regularly inundated. While drought declarations by the State of Washington occur once every 10-15 years, the city is served by reliable municipal wells and irrigation districts with high-altitude mountain reservoirs in the Alpine Lakes Wilderness that have consistently re-filled in their 100-plus year history.

Impacts

Primary regular impacts to the City of Leavenworth from natural hazard events are from wildland fire and severe storms. While some structural damage to older buildings from snow accumulation occurs, the primary impact is economic. Residents may not be able to travel to work, elderly residents may be at risk from loss of heat, and schools may be closed. Many residents work in Wenatchee, approximately 15 miles away, and travel to Wenatchee may be dangerous during a severe winter storm. Additionally, the city is a major tourist draw year-round, and severe storms can have a significant economic impact. Closures of HWY 97 and HMY 2 due to severe storms restrict the ability of Puget Sound residents from travelling to Leavenworth. Earthquake impacts could include similar travel restrictions if they affected Tumwater Canyon. Volcanic activity would primarily

affect visibility and could impact travel as well. Drought impacts would be minor due to the city's reliable water supply, although outdoor water use could be restricted and affect landscaping and defensible area from wildland fires. Flooding impacts would affect limited commercial buildings along the Wenatchee River, and landslides and avalanches could affect residential neighborhoods in the Ski Hill area.

Value of Resources at Risk

Losses from wildland fire would be primarily to residential areas and would be minor in nature. Structures affected by severe winter storms would be primarily residential or older commercial buildings but relatively minor in nature. Economic losses from winter storms can be significant. A substantial earthquake could affect a number of downtown structures which built at the turn of the 20th century as the town developed into a logging hub. While drought may affect portions of the city, reliable water supplies keep losses at a minimum.

High Priority Natural Hazard Mitigation Actions

Based on the hazard risk and vulnerability specific to the City and the County-wide natural hazard mitigation planning effort, the City has identified the following high-priority mitigation actions specific to the City of Leavenworth. The City stresses that mitigation actions identified in the County-wide plan are equally appropriate for the City to consider, particularly multi-hazard mitigation actions.

Earthquake

Priority 1. Retrofit existing critical facilities (i.e. hospitals, schools, etc.) in each community to ensure compliance with current building codes so the facilities are safe following earthquakes

Priority 2. Adoption of International Building Codes with adherence to Chelan County's recognized earthquake zone

Severe Storms

Priority 1. Implement a public notification system to alert the public to severe storm activity

Wildfire

Priority 1. Provide classes to homeowners in the urban / wildland interface zones on maintaining "safe zones" around their homes

Priority 2. Adopt regulations requiring metal roofs on structures in urban / wildland interface zones

Flooding

Priority 1. Buy-out existing homes that are subject to regular flooding

Priority 1. Raise existing homes above the floodplain

Priority 2. Adopt the State's Model Floodplain Ordinance to prohibit / regulate future development in the floodplain

Avalanche

Priority 1. Coordinate with the WSDOT to designate alternate evacuation routes from each community in the event of an avalanche

Multi-Hazard Mitigation

Priority 1. Identify and stock emergency shelters (including schools in the event students are unable to return home due to a storm) in each community to provide housing during severe storms

Priority 2. Schedule and implement Emergency Response Planning, including table-top exercises

Priority 3. Public Education / Community Preparedness Classes to teach neighborhoods to be self-reliant for three days following a disaster

City of Wenatchee

Natural Hazard Mitigation Sub-Plan

Overview

The City of Wenatchee, in partnership with members of the Chelan County Emergency Management Council, has been an active participant in the development of the Chelan County Natural Hazards Mitigation Plan. The county-wide plan reflects the hazards, vulnerabilities, and mitigation actions most likely to affect the citizens of Chelan County. The City of Wenatchee Natural Hazard Mitigation Sub-Plan builds on the County-wide plan and further delineates the unique hazards, vulnerabilities, and mitigation actions specific to the City. Mitigation actions identified in the County-wide plan and this sub-plan are, in many cases, equally appropriate for the City to consider for implementation.

Straightforward, simplified technical analyses were used for tasks such as estimating property values, determining the size of populations affected, and so forth. The reliance on the judgment of knowledgeable officials and simplified analyses is considered acceptable at this stage of the hazard mitigation planning process to allow the participating organizations to complete the tasks needed to develop the multi-jurisdictional natural hazards mitigation plan. As hazard mitigation planning continues and mitigation actions are proposed for funding and implementation, the participating organizations and jurisdictions recognize that additional information and analyses may be required.

The information below includes a jurisdictional profile of the City, natural hazard risks to the people and property of the City, and high-priority mitigation actions that could be implemented to reduce damage from catastrophic events.

Contact Information:

Stan Smoke, Fire Chief
Wenatchee, WA 98801
Telephone: (509) 664-3950

Population of Jurisdiction:

30,810 and increasing slightly

Estimated Geographical Size:

7 square miles

Principal Economic Base:

Commercial/Retail, Recreation and Tourism

Economic Characteristic:

Average

Predominant neighborhood types:

Commercial/retail, residential, industrial

Approximate number of structures:

See below

Estimated average value:

See below

Land Use Trends

The City of Wenatchee, with a current tax valuation of \$1,894,796,901, anticipates a decline in agricultural land use, modest gains in commercial and industrial land uses, and an increase in residential land uses. The City estimates that by 2023 there will be no agriculturally used land, or, any unused land within the City limits. In general, development trends for the City of Wenatchee indicate that 10% of the jurisdiction is still open for development, development is occurring rapidly and somewhat faster than planned, and expansion, redevelopment, and/or

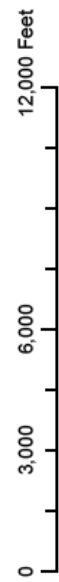
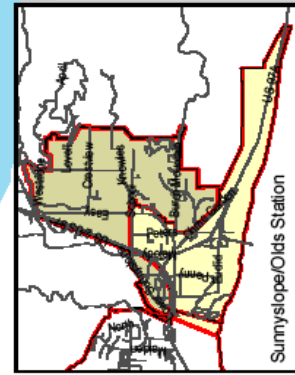
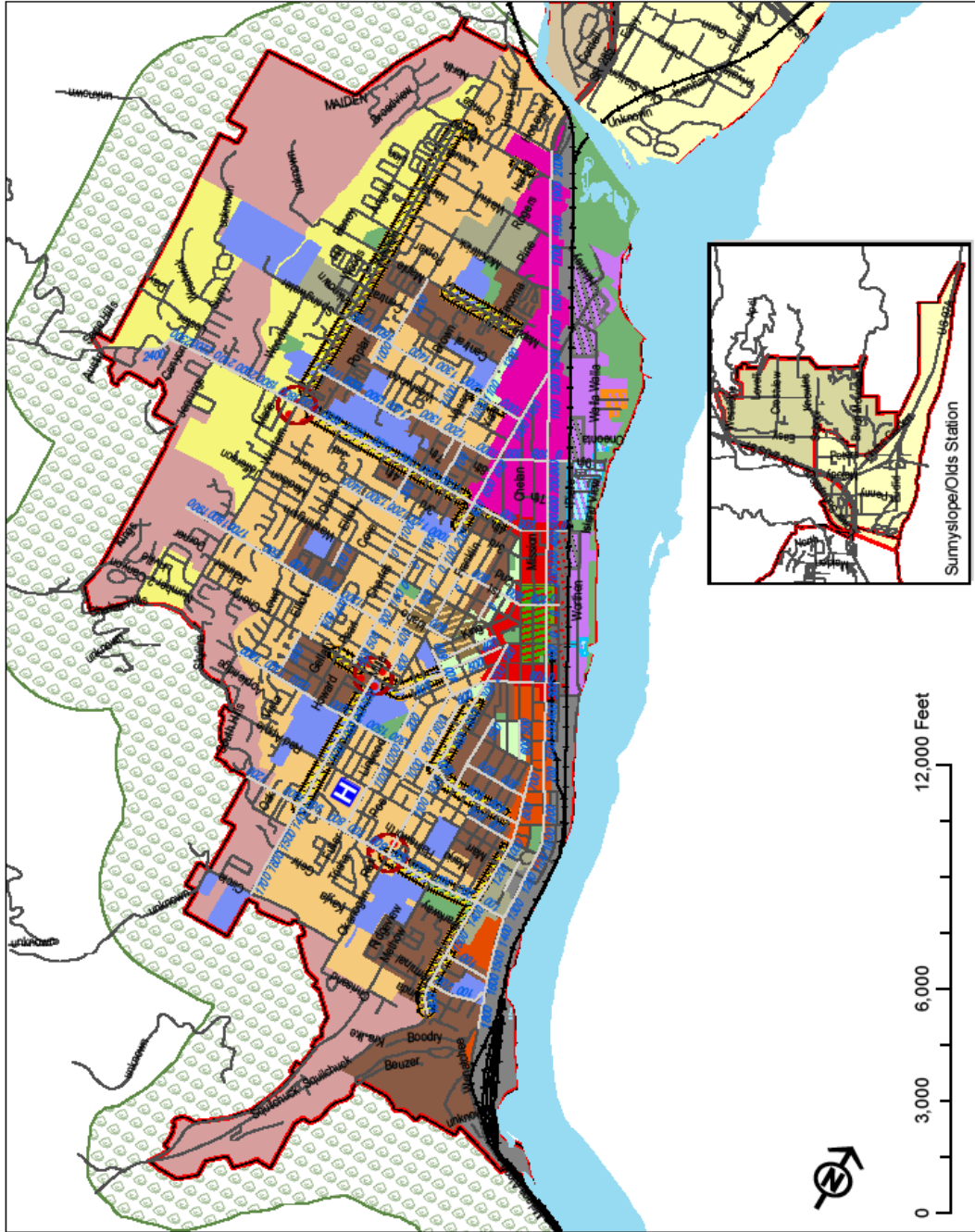
construction is occurring to some properties in a few locations. The City of Wenatchee has also recently adopted new mixed-use zoning districts along the Columbia River, and that will provide both residential and commercial opportunities, while increasing access to existing recreational facilities. Table I illustrates the anticipated change in land uses in the City of Wenatchee.

Table I: City of Wenatchee Land Uses

<i>Land Use Category</i>	<i>Current (2007)</i>
Civil & Cultural	1.5%
Commercial	10.5%
Industrial	4.2%
Multi-family	3.7%
Parks & Open Space	3.9%
Public Facilities	10.3%
Resource Lands	4.0%
Single Family	57.4%
Undeveloped	4.6%

Wenatchee Urban Area Land Use Map

April 26, 2007

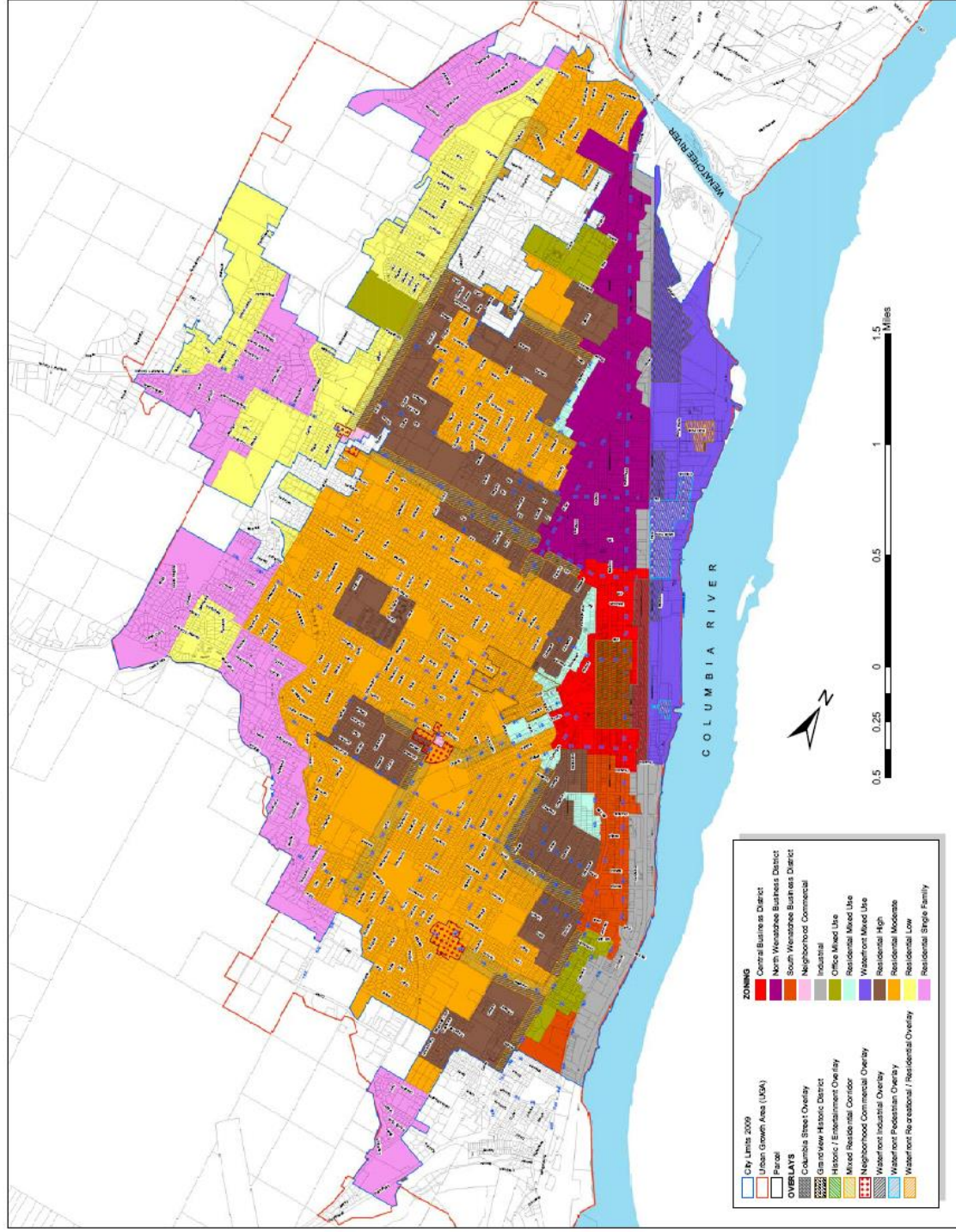


Legend

Urban Growth Area 2007	School Property	Parks
Residential Districts	Residential High	Residential Low
Residential Moderate	Residential Single Family	Business Districts
Central Business District	North Wenatchee Business District	South Wenatchee Business District
Office Mixed Use	Residential Mixed Use	Waterfront Mixed Use
Industrial	Overlays	CBD - Columbia Street
CBD - Historic/Entertainment	WMU - Industrial	WMU - Pedestrian
WMU - Residential/Recreational	Grandview Historic District	Neighborhood Commercial
Mixed Residential Corridor	Rural/Open Space/Foothills	Interim UGA - County Lead
Urban Growth Area - County Lead		

City of Wenatchee
Community Development

CITY OF WENATCHEE ZONING MAP



Utility and Transportation Service

A general overview of utility and transportation services available to the City was completed. Utility and transportation services are typically the first line of defense in responding to natural disasters, and an understanding of critical vulnerabilities in these areas aids in the development of potential pre-disaster mitigation actions. There are a variety of utility and transportation services in the City as outlined in Tables II and III.

Domestic water service for the City is provided through a partnership between the City, Chelan County PUD, and East Wenatchee Water District. The water supply comes from the “Eastbank Aquifer,” an underground water supply near Rocky Reach Dam that currently provides about 50 million gallons a day for commercial and residential use in Wenatchee.

Sanitary sewer service is provided by Wenatchee. Treatment of waste occurs at the Wenatchee Treatment Plant, a facility located on Worthen Street along the Columbia River. After the waste is treated and disinfected, the effluent is discharged into the Columbia River. Collection lines provide service throughout the City and into some unincorporated areas.

The City collects stormwater in facilities located throughout Wenatchee. These facilities are designed to handle a 10-year storm event.

The following utilities are not managed by the City. Electricity and Fiber Optics provided by the Chelan County Public Utility District. Internet (excluding fiber) Dial-up, DSL, and wireless internet are provided within the area by a variety of local businesses. Irrigation provided by the Wenatchee Reclamation District is the primary provider of irrigation services to landowners with reclamation rights. Natural Gas is provided by Cascade Natural Gas is the principle provider of natural gas to Wenatchee. Telephones Service for the land-line telephone network is provided by Verizon.

Table II: Utility services available

Category	Type	Availability
Power	Above grade electric	Yes
Power	Below grade electric	Yes
Water	Community system	Yes
Water	Individual water well	Yes
Sewer	Community sewer	Yes
Sewer	Individual septic	Yes
Phone	Above grade telephone	Yes
Phone	Below grade telephone	Yes
Communications	Commercial TV and radio	Yes
Communications	Cable TV	Yes
Gas	Natural gas pipeline	Yes

Gas	Propane/LPG	Yes

Streets/Roadways/Highways

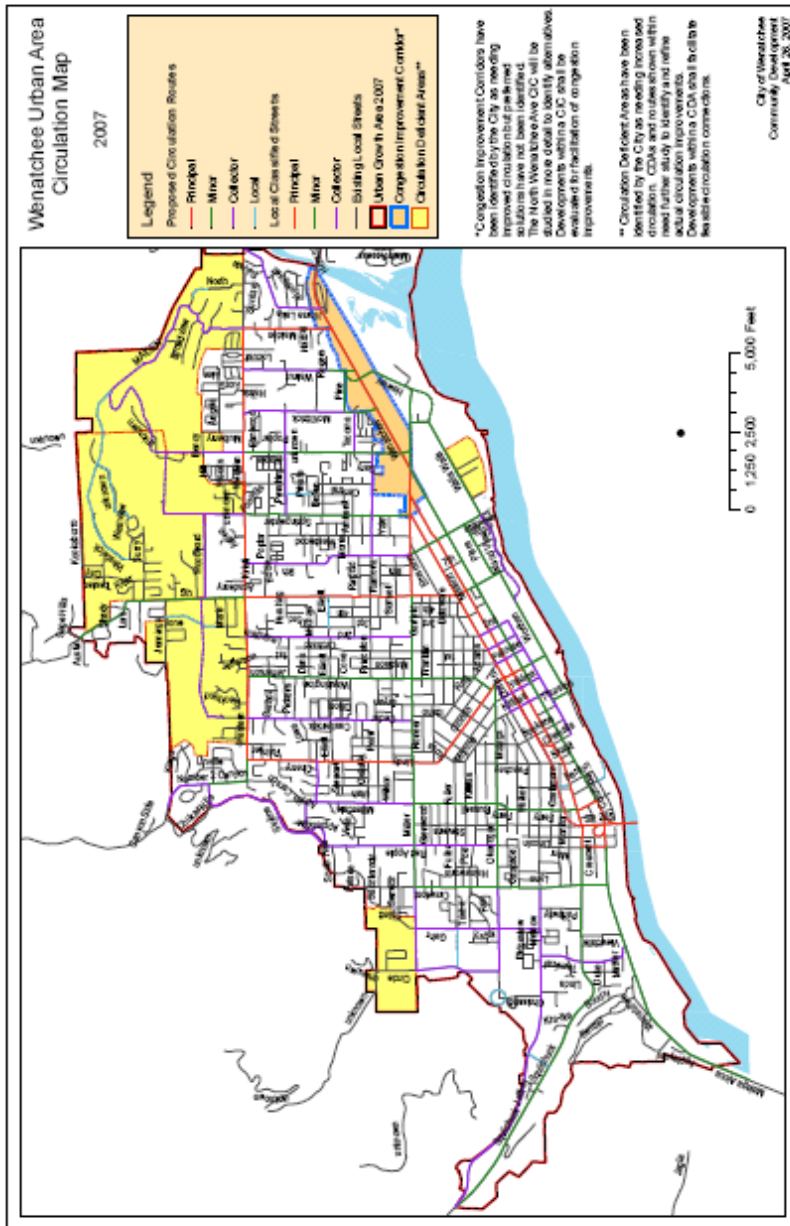
The City of Wenatchee's street system includes approximately 108 miles in total.

Primary streets within Wenatchee's transportation network are classified into three categories:

1. Principal Arterials - Provide access to major activity centers and connections to or along regional traffic ways. Such streets have the highest traffic volumes and are the major commuting routes.
2. Minor Arterials – Provide circulation between Principal Arterials and other activity centers. Streets typically don't exhibit as high of traffic volumes as Principal Arterials.
3. Collectors - Collect traffic from residential areas and connect to Principal and/or Minor Arterials.

Table III: Transportation service available

Category	Type	Availability
Access	Multiple roadway access	Yes
Access	Single road way access	Yes
Access	No direct roadway access	No
Access	Access by boat/plane only	No
Mobility	Depend on private vehicles	Yes
Mobility	Depend on private transit	Yes
Mobility	Limited to foot/boat/plane	No



Critical Facilities

An important aspect of natural hazard mitigation planning is identifying facilities or system components in the community whose presence or operation are “critical” or “vital” to the safety and welfare of the community. As part of the planning process, information is needed regarding the location, operation and basic vulnerability of these critical facilities for use in the planning process.

The City of Wenatchee is a thriving community with all of the critical facilities typical of a healthy small city. The list of critical facilities below identifies and documents fundamental information about these facilities; their location and ownership; and their function. The list also addresses if the facility or system has standby electrical power or if there may be difficulties with access and egress at the time of a disaster. Table IV shows the types of critical facilities within the City, while the following list details these facilities.

Table IV: Critical facilities present in the City of Wenatchee

Assisted living facility	Yes	Medical offices	Yes
Critical employer	Yes	Museum/Cultural center	Yes
Critical supplier/store	Yes	Nursing Home/Rehab	Yes
Emergency facility	Yes	Public works facility	Yes
Energy facility	Yes	Religious facility	Yes
EOC	Yes	Repetitive loss properties	No
Evacuation route	Yes	School	Yes
Government offices	Yes	Sewer system facility	Yes
HazMat facility	Yes	Transportation center	Yes
Hospital	Yes	Water system facility	Yes
Library	Yes		

List of Critical Facilities:

Assisted Living & Nursing Home / Rehabilitation Facilities

Blossom Creek, 1740 Madison
Blossom Valley, 1701 Orchard
Colonial Vista, 625 Okanogan
Columbia Heights, 1550 Cherry Street
Garden Terrace, 500 North Emerson
Highgate House, 1320 South Miller
Parkside Manor, 1230 Monitor
Riverwest Assisted Living, 900 North Western

Critical Community Employers

Blue Bird, 1470 Walla Walla

Central Washington Hospital, 1202 South Miller
Chelan County, 350 Orondo and 401 Washington Street
Chelan County PUD, 327 North Wenatchee
Stemilt Growers, 524 South Columbia Street and 1610 North Miller
Wenatchee School District, 235 Sunset
Wenatchee Valley College, 1300 Fifth
Wenatchee Valley Medical Center, 820 North Chelan

Critical Community Suppliers

Albertsons, 1129 North Miller
Home Depot, 1405 Maiden Lane
Lowes, 1200 Walla Walla
Safeway, 501 North Miller
Target, 1102 Springwater
Wal-Mart, 2000 North Wenatchee Ave

Emergency Facilities

Apple Valley Chapter of Red Cross, 12 Orondo
Wenatchee Fire & Rescue, 136 South Chelan

Energy Facilities

Chelan County PUD, 327 North Wenatchee
Cascade Natural Gas, 614 North Mission

EOC

Wenatchee Police Department, 140 South Mission

Evacuation Routes

George Sellar Bridge (south bridge)
Wenatchee River Bridge (north bridge)

Government / Public Buildings & Offices

Bureau of Land Management, 915 Walla Walla
Chelan County Emergency Management, 408 N. Western
Chelan County Sheriff/Regional Jail, 350 Orondo
City of Wenatchee City Hall, 129 South Chelan
Community Center, 504 South Chelan
Town Toyota Events Center, 1300 Walla Walla
Wenatchee Community Development, 1350 McKittrick
Wenatchee Convention Center, 201 North Wenatchee Avenue
Wenatchee Police Department, 140 South Mission
Wenatchee Parks & Recreation, 1350 McKittrick

Hazardous Materials Facilities

Wilbur-Ellis Basin, 1280 South Wenatchee Ave
AG Supply Company, 1115 North Wenatchee Ave

Cascade Distributing, 1012 Walla Walla
Northwest Wholesale, 1567 North Wenatchee Ave

Hospitals

Central Washington Hospital, 1201 South Miller
Wenatchee Valley Medical Center, 820 North Chelan

Library

Wenatchee Public Library, 310 Douglas

Medical Facilities

Central Washington Hospital, 1201 South Miller
Wenatchee Valley Medical Center, 820 North Chelan
Columbia Valley Community Health, 600 Orondo

Museum / Cultural / Events Centers

Wenatchee Valley Museum & Cultural Center, 127 South Mission
Town Toyota Center, 1300 Walla Walla Avenue

Nursing Home / Rehabilitation Facilities - See Assisted Living Facilities above

Public Works

Wenatchee Public Works, 1350 McKittrick

Religious Facilities

Apple Valley Baptist Church, 435 South Mission
First Baptist Church of Wenatchee, 1301 Maple
First Presbyterian Church, 1400 South Miller
First United Methodist Church, 941 Washington
Grace Lutheran, 1408 Washington
Lincoln Park Baptist Church, 286 Crawford
River of Life Foursquare Church, 20 South Wenatchee Avenue
St Joseph's Catholic Church, 625 South Elliott
Seventh Day Adventist Church, 508 North Western
Wenatchee First Assembly of God, 1520 McKittrick
Wenatchee Free Methodist Church, 1601 5th Street
Wenatchee Valley Baptist Church, 650 Crawford

Schools & Colleges

Columbia Elementary School, 600 Alaska
Lewis & Clark Elementary School, 1130 Princeton
Lincoln Elementary School, 1224 Methow
John Newberry Elementary School, 850 North Western Ave
Washington Elementary School, 1401 Washington
Foothills Middle School, 1410 Maple
Orchard Middle School, 1024 Orchard

Pioneer Middle School, 1620 Russell
Wenatchee High School, 1101 Millerdale
Westside High School, 1521 Ninth
Wenatchee Valley College, 1300 Fifth

Sewer System Facility

Public Works Water/Sewer Division, 25 North Worthen

Transportation Facilities

Link, 301 South Wenatchee Ave
Wenatchee High School, 1101 Millerdale

Water System Facility - Not located in the city

Hazard Risk and Vulnerability

The City of Wenatchee, because of geographical, geological and topographical diversities, is subject to the wide variety of hazards identified in the County-wide plan; however, some hazards represent a slightly greater risk to the community either in occurrence probability or potential damage. For ease of use of this plan, the City of Wenatchee elected to concentrate its efforts on Wildland Fire, Severe Storm, Flooding, Earthquake and Landslide hazards. Hazard mitigation analyses conducted by City of Wenatchee staff was based on the best currently available information and data regarding the characteristics of the city; the natural hazards that threaten the people, property, and environment of the City; and the impacts the City has suffered in past disasters. A combination of existing hazard documents, particularly the Chelan County Hazard Inventory and Vulnerability Assessment (HIVA), were used and compared to the experience, knowledge and judgment of local officials representing the City to conduct the hazard mitigation analysis. Table V outlines the overall relative ranking of natural hazard risks to the City and an estimate of the population at risk to the hazard. While Wenatchee is an NFIP participant, there are no RL properties within the jurisdiction.

Table V: Hazard risk and vulnerability

<i>Hazard</i>	<i>Relative Ranking</i>	<i>Percent at Risk</i>
Drought	NA	NA
Earthquake	4	100
Flooding	3	5
Landslide	5	10
Wildland Fire	1	25
Severe Storm	2	100
Avalanche	NA	NA
Volcanic Activity	NA	NA

Rationale for Hazard Risk and Vulnerability Ratings

Probability of Future Occurrence

Portions of the City of Wenatchee in the western foothills as well as the northern edge of the Sunnyslope urban growth area are susceptible to wildland fires. These fringe areas are primarily shrub-steppe sage grass areas and typically burn quickly, although the intensity is less than that of a forest fire; nonetheless, residential structures can be at risk. Severe winter storms can affect the entire city. While the city is well-prepared for snow removal, extreme events can make roads unpassable and isolate residents. The city can experience limited but intense flash flooding in No. 1 and No. 2 Canyons that will affect a number of households. The City is currently developing a stormwater retention pond/trailhead in No. 1 Canyon in response to a flash flooding event in 2010. To the east, the city is bounded by the Columbia River, a regulated waterbody whose flow is determined downstream by Rock Island Dam. Catastrophic failure of Grand Coulee dam upstream could result in significant inundation of the city's eastern low-lying areas. Minor earthquakes have occurred with little impact. Some landscape potential exists on the fringe of the urban growth area as the city expands into the foothills. The city did not rate the remaining natural hazard risks due to their infrequency.

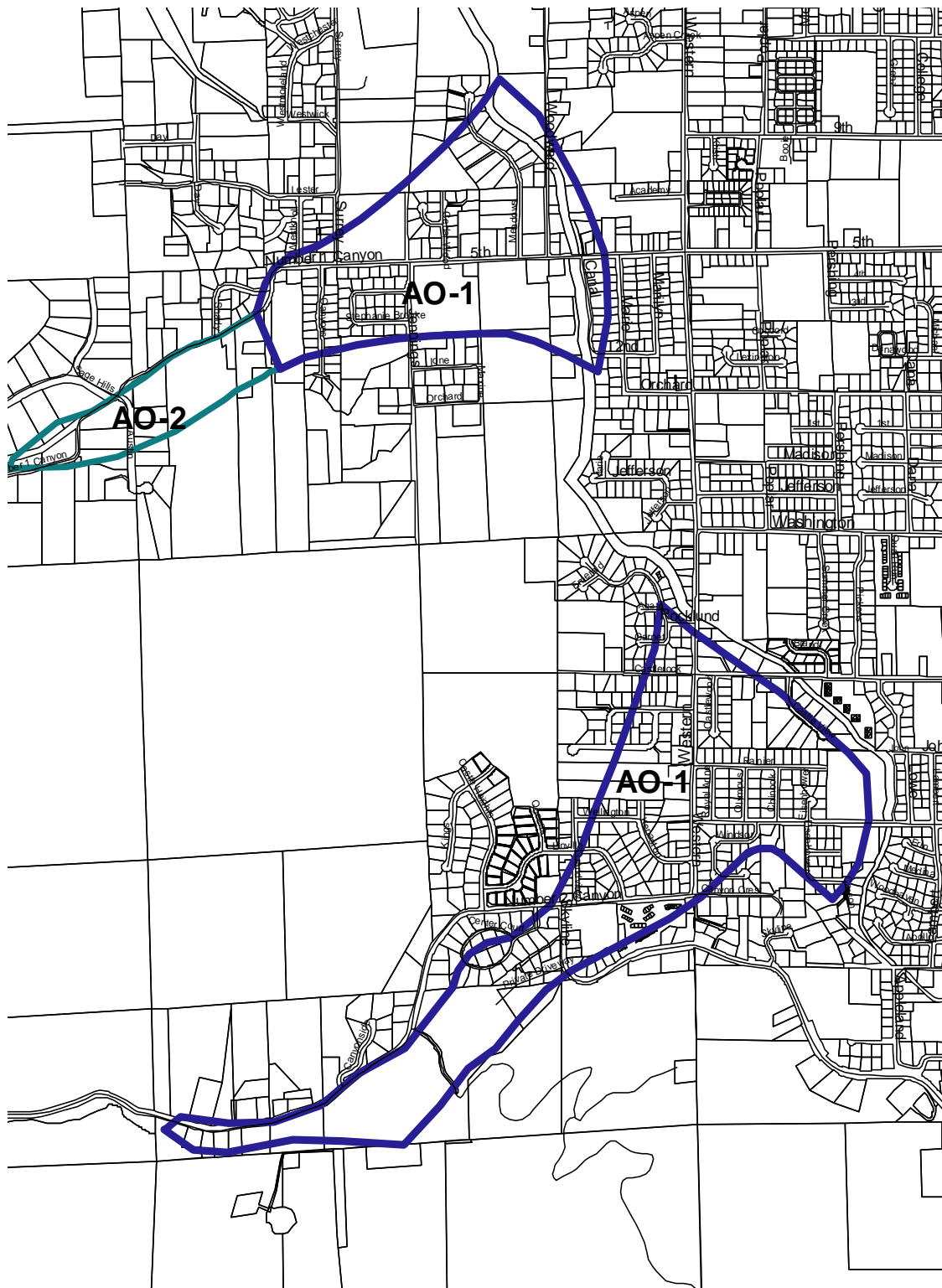
Impacts

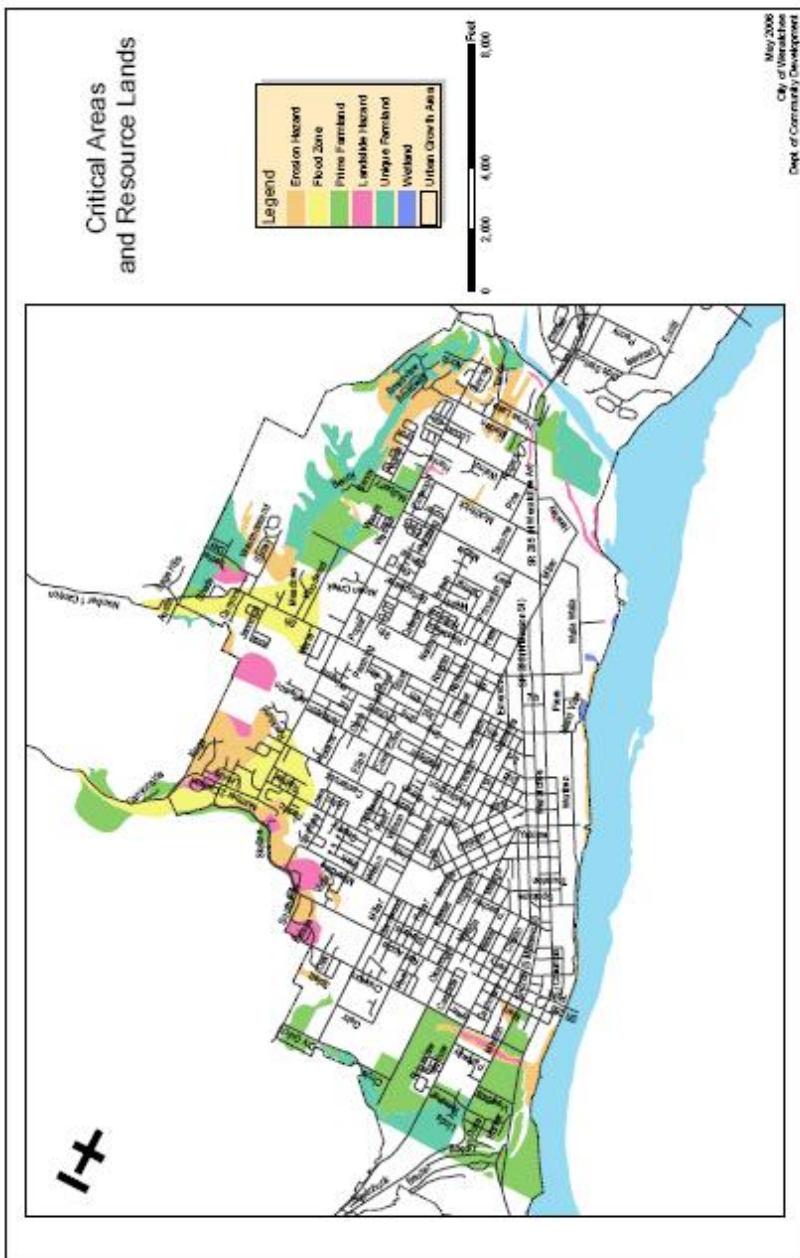
Primary impacts to the City of Wenatchee from natural hazard events are from wildland fires, severe winter storms and localized flash flooding. Wildland fires affect residential structures on the urban fringe and typically result in the loss of outbuildings. While some structural damage to older buildings from rain-on-snow events can occur, the primary impact is economic from loss of transportation capacity, primarily road closures, but also from closure of Pangborn airport in East Wenatchee. Pangborn airport is a regional hub and can be closed frequently during the winter due to winter storms and poor visibility. Visitors may not be able to enter or leave, residents may not be able to travel to work, elderly residents may be at risk from loss of heat, and schools may be closed. Localized flash flooding from the western canyons primarily affects landscaping and outbuildings, although impediments in drainage ditches can force water into residences, which occurred in 2010. Earthquakes and landslides, while unlikely to occur, could affect residential neighborhoods near the Foothills to the west of the city. Drought impacts would be minor and restricted to possible outdoor water use restrictions due to the reliable regional water supply system. Avalanche conditions do not exist within the city limits. Impacts from volcanic activity could include reduced visibility and possible traffic congestion and restrictions as well as air quality concerns.

Value of Resources at Risk

Losses from wildland fire would be primarily to residential areas with an emphasis on outbuildings and minor structures of low value. Similarly, flash flooding has typically affected minor structures with some impact to residences in areas where drainage ditches have been blocked. Structures affected by severe winter storms would be primarily residential or older commercial buildings but relatively minor in nature. It would be difficult to estimate economic losses from winter storms.

Flood Zones





High Priority Natural Hazard Mitigation Actions

Based on the hazard risk and vulnerability specific to the City and the County-wide natural hazard mitigation planning effort, the City has identified the following high-priority mitigation actions specific to the City of Wenatchee. The City stresses that mitigation actions identified in the County-wide plan are equally appropriate for the City to consider, particularly multi-hazard mitigation actions.

Wildland Urban Interface Risk Reduction

Priority 1. Continue enforcement of planning, zoning, and building codes within wildland urban interface areas of the City.

Priority 2. Continue public education programs that emphasize fire defensible space through FireWise landscaping.

Priority 3. Continue emphasis of automatic and mutual aid agreements to ensure efficient fire response and use of resources.

Severe Storm Mitigation

Priority 1. Early warning from the National Weather Service and public notification from the emergency alert system.

Priority 2. Community public education and preparedness for disasters.

Priority 3. Maintain emergency response plans that include warning, evacuation, emergency shelters, and other emergency procedures.

Flood Zone Mitigation

Priority 1. Strict floodplain zoning / regulations both in the current city limits and the urban growth area.

Priority 2. Public education to alert the public of flooding hazards.

Priority 3. Maintain emergency response plans that include warning, evacuation, emergency shelters, and other emergency procedures.

Priority 4. Encourage and support watershed monitoring and rehabilitation practices for fire burn areas surrounding the city.

Earthquake

Priority 1. Continued enforcement of building and fire code requirements.

Priority 2. Community public education and preparedness for disasters.

Priority 3. Maintain emergency response plans that include warning, evacuation, emergency shelters, and other emergency procedures.

Priority 4. Maintain emergency response readiness through disaster training and exercises.

Landslide

Priority 1. Development of appropriate land use controls as City expands into Wenatchee Foothills and No. 1 and No. 2 Canyons.

Chelan County Unincorporated Areas Natural Hazard Mitigation Sub-Plan

Overview

Chelan County, in partnership with members of the Chelan County Emergency Management Council, has been an active participant in the development of the Chelan County Natural Hazards Mitigation Plan. The county-wide plan reflects the hazards, vulnerabilities, and mitigation actions most likely to affect the citizens of Chelan County. The Chelan County Natural Hazard Mitigation Sub-Plan builds on the County-wide plan and describes the unincorporated areas within the County, including Stehekin, Manson, Monitor, Dryden, and Peshastin, by using seven (7) area designations to describe the rural communities within the County. Infrastructure, demographics, land use patterns, utilities, and transportation throughout the County are described in the sub-plan. Chelan County unincorporated areas will rely on the hazard risk assessment and mitigation actions identified in the larger plan. Individual jurisdictions will rely on their specific sub-plans for these items.

Straightforward, simplified technical analyses were used for tasks such as estimating property values, determining the size of populations affected, and so forth. The reliance on the judgment of knowledgeable officials and simplified analyses is considered acceptable at this stage of the hazard mitigation planning process to allow the participating organizations to complete the tasks needed to develop the multi-jurisdictional natural hazards mitigation plan. As hazard mitigation planning continues and mitigation actions are proposed for funding and implementation, the participating organizations and jurisdictions recognize that additional information and analyses may be required.

Contact Information:

Mike Kaputa, Director
Natural Resource Department
Wenatchee, WA 98801
Telephone: (509) 670-6935

Population of Jurisdiction:	72,100 and increasing slightly
Estimated Geographical Size:	2,996 square miles
Principal Economic Base:	Agriculture; Recreation and Tourism
Economic Characteristic:	Below Average for the State
Predominant neighborhood types:	Agricultural, residential, commercial/retail
Approximate number of structures:	See below
Estimated average value:	See below

Geographic Area Descriptions

Geographic area descriptions include the following:

1. Chelan-Manson
2. Entiat River Valley

3. Malaga-Stemilt-Squilchuck
4. Lower Wenatchee River Valley
5. Upper Wenatchee River Valley
6. Plain-Lake Wenatchee
7. Stehekin

CHELAN-MANSON

Location and Geology

In the Chelan-Manson area is situated between the Sawtooth and Chelan Mountains and is bounded by the Columbia River on the southeast. The Basin is dominated by Lake Chelan, a glacially formed lake approximately 55 miles long with an average width of 1.5 miles and a maximum depth of 1,500 feet. Three major tributaries: the Stehekin River, Railroad Creek and Twenty Five Mile Creek, along with numerous lesser streams feed the lake. The outfall is controlled through a hydroelectric dam and a penstock system to the Columbia River. Lake Chelan and the Columbia River are important water bodies; providing the main source of drinking water for the area, they are also important for irrigation and recreation. The water quality of Lake Chelan is a major concern to many area residents. As described in The Lake Chelan Water Quality Plan, the Lake currently has been classified as having low biological productivity and high water clarity.

Elevations in the Chelan/Manson area range from just over 700 feet above sea level along the Columbia River to 9,511 feet at the summit of Bonanza Peak, the highest point in the County. Many of the soils within the area become unstable or erosive as slopes increase. An analysis of existing land use patterns indicates that virtually all existing structural and orchard development has occurred on those lands below 2,000 feet in elevation and on less than a 20% slope. The geology is characterized by underlying rock formations covered by a shallow mantle of soils in the valleys.

There is a wide variety of soil conditions in the planning area. Throughout much of the area, the soil is underlain with alluvial deposits and glacial drift. Volcanic pumice and ash from the Glacier Peak region have added substantially to the depth and character of the soil in many areas. The mountainous terrain, with characteristically steep slopes and high elevations, consist largely of rock outcroppings and shallow soils. The Soil Conservation Service has classified 84% of the Lake Chelan Basin area as being forest. Lands below the forest level consist of grasses, sagebrush and shrubs, with the more level areas developed as crop land.

The climate is characterized as "marine west coast", with hot, dry summers and mild to severe winters. Temperature and precipitation vary widely depending on the elevation and proximity to the Cascade Crest. Lake Chelan exercises a local moderating influence on temperatures which adds to the suitability of the area for orchard production.

The thermal winds around Chelan Butte provide national and international hang gliding and parasailing opportunities. With development of access to the top of the Butte, parking, launches and other facilities, the Sky Park is now renowned as one of the best hang gliding areas and facilities in the world.

Vegetation

Fauna is found in three specific habitats: the wetlands along the Columbia River and the Lake Chelan shorelines, the canyon/steppe habitat of the steep drainage's and the urban areas of Manson, Chelan and Chelan Falls. The Chelan Butte Wildlife Refuge is a 12,000 acre game refuge. The property was purchased by the Chelan County PUD #1 in 1967 as a mitigating measure for the construction of the Rocky Reach Hydroelectric Dam. The refuge is primarily inhabited by game birds and occasionally migrating big game animals. The area is presently managed by the Washington State Department of Fish and Wildlife.

Land Uses

As stated above, most development has occurred below the 2,000 elevation on slope of less than 20%. The area enjoys a variety of recreational uses with two urban growth areas: City of Chelan and unincorporated Manson, the incorporated City of Chelan, and a developed community of Chelan Falls.

Most development is concentrated around the lower end of Lake Chelan, where private land dominates. The upper portion of the basin lies within the North Cascades National Park and the Lake Chelan National Recreation Area, while the area between is in the Wenatchee National Forest, a portion of which is in the Glacier Peak Wilderness Area.

Rural Character

Chelan and Manson communities provide urban services within defined boundaries. The remaining portion of the region is characterized by a variety of parcel sizes containing a mix of orchards and vineyards, wineries, large estate homes, golf courses, ranchettes, open space, pasture land. To the west access roads become primitive, private or forest service which greatly reduces the number and types of land uses. Higher levels of development, primarily residential uses, are common along the lakes. These homes provide for the rural recreational lifestyle and character of the area. Development among the hills and hilltops is relatively new but is consistent with the rural area, especially when developed in a manner which reduces road cuts and visual impacts, preserves open space, provides agriculture and/or recreational opportunities and protects environmentally sensitive areas.

ENTIAT VALLEY

Location and Geology

The Entiat Valley area encompasses the Entiat River Basin. The Basin is shaped like a triangle with the Columbia River forming the base and the valley lying between the Chelan and Entiat Mountains. The Entiat River begins at the terminus of the Entiat Glacier on Mt. Maude and flows approximately 50 miles into the Columbia River at the south end of the City of Entiat. The drainage is generally long and narrow, with numerous small tributaries flowing into the main river. The north fork of the Entiat River and the Mad River are the largest tributaries. Not only do these bodies of water and their tributaries provide the main source of drinking water for the area, but they are also important for irrigation and recreation.

The climate is also characterized as “marine west coast”, with hot, dry summers and mild to severe winters.

Elevations in the area range from just over 700 feet above sea level along the Columbia River to 9,249 feet at the summit of Mt. Fernow. Many of the soils within the area become unstable or erosive as slopes increase. Consistent with development patterns in Chelan/Manson, virtually all existing structural and orchard development has occurred on those lands below 2,000 feet in elevation and on less than a 20% slope. Throughout much of the area, the soil is underlain with alluvial deposits and glacial drift. The geology of the Entiat area is igneous bedrock with granite and diorite predominating.

Vegetation

Vegetation in the valley depends to a great extent on the elevation, with most of the land above 1,500 feet being forested. Lands below the forest level consist of grasses, sagebrush and shrubs. The more level sites have, for the most part been developed as crop land, with orchards generally occurring where irrigation has been possible.

Land Uses

The Entiat basin is primarily natural habitat area with rural residential primarily along the Entiat River. Development is limited by single public access up the valley. The City of Entiat and associated urban growth area are located at the base of the Entiat River along the Columbia.

Rural Character

As noted above, the Entiat Valley is a long narrow valley along the Entiat River, over forty miles long. The area provides for several pockets of residential development and rural commercial or businesses necessary to support the isolated lifestyle. Parcel sizes vary greatly due to ownership and buildable area. Along the river there are portions of land which provide generally flat developable land which hills and steep slopes primarily contain larger parcels of land which help protect critical areas. Residential structures are mixed in among the natural environment. Mining, timber activities and ranchettes are common. Higher levels of development are common along the eastern portion of the river, closer to the main highway and the City of Entiat. Several branch roads provide access to residential and recreational land uses among the mountains adjacent to the river. Future development and clustering would be compatible when developed in a manner which reduces road cuts and visual impacts, preserves open space, provides agriculture and/or recreational opportunities and protects environmentally sensitive areas.

MALAGA-STEMILT-SQUILCHUCK

Location and Geology

The Malaga-Stemilt-Squilchuck area covers the southeast corner of the County. It includes Pitcher Canyon, Halverson Canyon, Mission Peak, Wenatchee Heights, Jumpoff Ridge, the Malaga and Three Lakes Communities, Rock Island Dam and vicinity, and the drainage basins of

Squilchuck Creek, Stemilt Creek, and Colockum Creek. The area is bordered by the Columbia River to the north and east, and by the Kittitas County boundary to the south.

Land Uses

Chelan County's first irrigation ditch was built in Malaga to serve the orchards and vineyards planted by early settlers. Malaga was named for the grapes which were grown there for many years. The town site of Malaga was originally platted in 1903. Development of the Alcoa plant in the early 1950's stimulated residential development in the area. Most of the recent development has occurred southwest of the original town site especially around Cortez Lake which is part of the Three Lakes residential area. In 2006, Malaga completed a visioning planning document which defined the LAMIRD boundary and set appropriate land use designations (see Appendix E).

The Stemilt-Squilchuck Community Vision (see Appendix J) addresses the areas primary land uses and goals. The area includes the Wenatchee Heights area is a large plateau overlooking the Wenatchee Valley. The Heights contains several large orchard tracts. Primary crops include apples, cherries and pears. Residences are scattered throughout the area. The Stemilt Hill is another large agricultural area. The area is well known for its high quality cherry crop. Most residential development is scattered throughout the orchards. Colockum Creek, Jumpoff Ridge, Stemilt Basin, Mission Ridge comprise mainly undeveloped open spaces varying from grassland to forest. Primary land uses in those areas include rangeland, timber production and recreation. Recreation, industrial development, and agriculture are the most significant contributors to the economic base of the planning area. Mission Ridge ski area is located in the upper most portion of the planning area and is accessed by way of Squilchuck Road.

Rural Character

Malaga's unique rural character is addressed in large part by the Malaga Plan (Appendix E); however, the region outside the plan provides a rural character unlike any other in the County. This area is known for widening roadways that hug the hill sides. Rural farm life is most common with early morning tractors, spraying, farm worker housing, ranches are common where water rights are available. Larger parcels of land with dry farms or natural landscape are common as the roads turn private or end. Moving to the south of Malaga the rural character is defined by industrial uses, primarily the Alcoa plant. Future development and clustering would be compatible when developed in a manner which reduces road cuts and visual impacts, preserves open space, provides agriculture and/or recreational opportunities and protects environmentally sensitive areas.

LOWER WENATCHEE RIVER VALLEY

The Lower Wenatchee River area includes the City of Cashmere and the communities of Monitor and Sunnyslope, Ollala, Hay, Nahahum, Warner, Warm Springs, Brender, Brisky, Tripp, Yaksum and Fairview Canyons, Mission, Brender and Swakane Creeks.

This area was first settled by members of the Wenatchi Indian Tribe. Where Cashmere now stands, the winter village of Ntuatckam was located and had a population of about 400 in 1850.

Missionaries founded a small mission near the present site of Cashmere in 1863. In 1870, the first irrigation ditch in the valley was built which permitted irrigation around the mission. Other permanent settlers began arriving around 1881. They first settled in the Monitor area, but gradually home sites could be found in all areas of the Wenatchee Valley. The first major irrigation project, the Peshastin Ditch, was completed in 1890 to serve Cashmere and Dryden. The completion of the Great Northern Railway through Wenatchee in 1892 provided the impetus for undertaking the construction of the Highline and Icicle Canals. Completed in the early 1900s, these canals provided a source of water for orchards on the north and south sides of the Wenatchee River.

Today, the agricultural and services industries are the most significant contributors to the economy of the planning area. Orchards are located throughout much of the lower valley between Dryden and Sunnyslope. Major crops include apples, pears and cherries. Services industries are found primarily in the incorporated City of Cashmere and the unincorporated community of Sunnyslope. In 2008 Sunnyslope was included in the City of Wenatchee Urban Growth Area (see Appendix K).

Rural Character

This region of Chelan County provides areas of flat or rolling hills development for orchards and residential living among the numerous streams, hills and natural habitat areas. The rural environment is characterized by orchards in the valley and on the lower elevations of the rolling hills. Preservation of farming rights is important to the regional. Along the primary river – the Wenatchee River, and the highway there are several communities which provide small town living and work opportunities. These towns are a source of great pride to the local residents. They represent the best of small town living with concentrated development in a core “downtown” and residential homes, and rural public services, such as a post office or school. These areas also contain industrial processing facilities necessary for the agricultural activities. Moving away from the Wenatchee river valley and orchards, land to the north is characterized by evergreen trees while the southern portion of the valley’s undeveloped land contains natural grasses, shrubs and occasional trees. Future development and clustering would be compatible when the development was consistent with farming rights, reduced road cuts and visual impacts, and protects environmentally sensitive areas.

UPPER WENATCHEE RIVER VALLEY

The Upper Wenatchee River Valley area includes portions of the Wenatchee River, Chumstick Creek, Peshastin Creek and Icicle River Valleys, including the City of Leavenworth, the Urban Growth Area for Peshastin and the community of Dryden.

The topography of the west and north is a direct result of large mountain glaciers that formed in the Icicle, Tumwater, and Chumstick Canyons. Glacial action was responsible for deepening and smoothing the valley floors. These glaciers probably terminated along the Mountain Home Road, to the southeast of Leavenworth, where there is evidence of a terminal moraine.

Throughout much of the area, the soil is underlain with alluvial deposits and glacial drift. Volcanic pumice and ash from the Glacier Peak region have added substantially to the depth and

character of the soil in many areas. The mountainous terrain, with characteristically steep slopes and high elevations, consist largely of rock outcroppings and shallow soils.

The Wenatchee and Icicle Rivers and supporting tributaries are important bodies of water. Not only do these bodies of water and their tributaries provide the main source of drinking water for the area, they are also important for irrigation, recreation, and fish and wildlife habitat.

Rural Character

Most of the Upper Wenatchee River Valley contains evergreen mountains with residential development along the rivers and lakes. The development areas are “pockets” of higher densities surrounded by natural lands. Land north and east of Leavenworth contains several unofficial communities – Tumwater, Chumstick, etc, which are expected to continue growth patterns of smaller lots sizes along developed roads and water ways. Land to the west of Leavenworth is extremely limited by the mountains and steep slopes. Small parcel sizes are common due to the building area and ownership patterns. Future development and clustering would be compatible when developed in a manner which reduces road cuts and visual impacts, preserves open space, provides recreational opportunities and protects environmentally sensitive areas.

PLAIN-LAKE WENATCHEE

The Plain/Lake Wenatchee area is located on the east slope of the Cascade Mountains in west central Chelan County, roughly within the boundaries of the Lake Wenatchee Range District of the Wenatchee National Forest. It is comprised of a number of river valleys which feed into Lake Wenatchee and the Wenatchee River in the Cascade Mountains in North Central Washington State.

Much of the area is mountainous forest land designated as National Forest. Most of the private land in the area is concentrated along the major water bodies and transportation routes.

Due to steep unstable slopes, floodways, wetlands and other critical areas, much of the area is not suitable for development. Development is also constrained by designated resource lands. Current development has occurred on limited areas around the river edges, Lake Wenatchee and Fish Lake.

There are 30 different soil types in the area. Of primary concern is the limitation for septic tank absorption fields, based on soil types. Three of the soil series, the Brief, Burch and Chiwawa have only slight limitations for septic tanks and are therefore desirable soils to develop. The remaining 27 soil types have septic tank limitations.

The area has two large lakes of state-wide significance: Lake Wenatchee and Fish Lake. There are also dozens of smaller alpine lakes in the Wenatchee National Forest, which includes portions of three different wilderness areas. Lake Wenatchee and Fish Lake support a number of recreational uses. There are also a number of significant rivers including: Wenatchee River, Chiwawa River, Nason Creek, Little Wenatchee River, White River, Napeequa River, Phelps Creek, and Whitepine Creek.

Rural Character

Most of the Plain-Lake Wenatchee area contains residential homes among the evergreen mountains with denser populations along the lakes and rivers. This is consistent with the rural recreation opportunities of the area. Plain provides a community area with commercial services and a public post office and school. Development is limited by ownership and parks but future development of recreational support services would be consistent with current activities. Future development and clustering would be compatible when developed in a manner which reduces road cuts and visual impacts, preserves open space, provides recreational opportunities and protects environmentally sensitive areas.

STEHEKIN

The Stehekin area includes the northeastern most portion of the Lake Chelan National Recreation Area, extending to the County boundary and the entirety of the northwest end of Chelan County, including that part of the North Cascades National Park that falls within the County boundary. The Stehekin area is impacted by the National Park Service 1995 General Management Plan for the Lake Chelan National Recreation Area. The Park Service manages the majority of federal property in the Stehekin. There are about 820 acres of private land, classified as single family in the above tables, intermingled with federal land administered by the National Park Service and commercial forest lands.

The Stehekin Valley is a U-shaped, glacially-carved canyon in the North Cascades. The valley is nearly 6000 feet deep, and a mile or less wide as it extends 25 miles from Lake Chelan to the Cascade Crest. The valley floor is relatively flat with very little slope. The walls rise abruptly on each side of the river; hence, all construction has occurred on the floor of the valley. It is prone to flooding. Efforts have been made to move residential structures from the flood plain/way areas to higher ground.

The surface waters of the Stehekin River system, including the upper portion of Lake Chelan, can be characterized as clear and cold, with high oxygen content and low fertility. During major floods, the river spills its banks and occupies its floodplain, moderating the ultimate height of the flood's crest.

Native trees include western red cedar, Douglas and grand firs, ponderosa and white pines, big leaf, Douglas and vine maples, dogwoods, alders and cottonwoods. Limited logging, and timber cutting for firewood have opened some areas to change. Taking advantage of such change, or adapting to it, have been mule deer, black bears, coyotes and cougars, along with numerous small mammals and birds.

Rural Character

Most of the Stehekin is undeveloped federal land. A small community along the northern most shore of Lake Chelan continues to develop and grow as a recreation tourist service center. The area is spotted with remote cabins and is not expected to develop. Should future development or clustering occur it would be compatible when developed in a manner which reduces road cuts and visual impacts, preserves open space, provides recreational opportunities and protects environmentally sensitive areas.

NATURAL SYSTEMS/CRITICAL AREAS

The GMA states that counties should “protect critical area.” Critical areas include the following areas and ecosystems: (a) wetland; (b) areas with a critical recharging effect on aquifers used for potable water; (c) fish and wildlife habitat conservation areas; (d) frequently flooded areas; and (e) geologically hazardous areas.

The GMA requires the adoption of interim development regulations for protection of these critical areas. The County has completed the planning process for developing these regulations following an extensive citizen participation process. Many of the issues and concerns that guided the development of the critical area regulations were discussed and addressed in the comprehensive planning process that led to the formation of this document.

The GMA also requires the provision for the protection of the quality and quantity of ground water used for public water supplies. The land use element is also required to review; where applicable, drainage, flooding, and storm water run-off and to provide guidance for corrective actions to mitigate or cleanse those discharges that pollute waters of the state.

Wetland(s) are defined as “areas that are inundated or saturated by surface water or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Wetlands do not include those artificial wetlands intentionally created from non-wetland sites, including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street, or highway. Wetlands may include those artificial wetlands intentionally created from non-wetland areas created to mitigate conversion of wetlands”, RCW 36.70A.030.

III. FUTURE NEEDS AND ALTERNATIVES

Analysis of Population and Demographics

The analysis of local population and demographic trends is important for a broad understanding of the County and to anticipate future needs. The analysis of population projections for the next 20 years is based on Office of Financial Management projections for the County. Population within the County has grown steadily over the last few decades.

Table 3: Population Data for Cities and County

	US Census				OFM Projections (High Series)			
Jurisdiction	1970	1980	1990	2000	2008	2010	2020	2030
Chelan County	41,103	45,061	52,250	66,616	72,100	80,050	93,826	107,177

Cashmere	1,976	2,240	2,544	2,965	See below
Chelan	2,837	2,802	2,976	3,526	
Entiat	360	445	449	957	
Leavenworth	1,322	1,526	1,692	2,074	
Wenatchee	1,6912	17,257	21,829	27,856	

Within Chelan County the Census Bureau has delineated areas known as Census County Divisions (CCD). There are eight CCD's in Chelan County. The population of Chelan County grew by 7,189 persons (16% increase) during the decade from 1980 to 1990. The population increased from 45,061 to 52,250. From 1990 to 2000 the county population grew from 52,250 to 66,616, a 27.5% increase. During this same period, 55% of the growth went to the cities.

Age Groups

Total population age 65 and over in 2000 dropped from 16% of the county population to 13.9%.

In 1990, the predominant age group county wide was the 30-39 cohort. This cohort averaged 17% of each respective CCD. In 2000 the 30-39(1990) cohort tracked into the 40-49 age group as still the predominant age group. The changes were: in the Cashmere CCD, the 40-49 age group was replaced by the 10-19 age group as the largest; In the Wenatchee CCD, the 0-9 age group became the largest; and county wide the 40-49 cohort was replaced by the 10-19 cohort. However, the majority of the CCDs still maintained the 40-49 age group as the largest.

During the School year period of 1980-81 to 1990-91, the Washington State Public School system within the Chelan – Manson Area experienced a 39% increase in full time equivalent (FTE) students from grades K-12. All school districts experienced significant growth between 1990 and 2000. The Chelan District experienced a 38.6% increase. From 1990 -2000, the Lake Chelan School District experienced another 15.8% increase in enrollment. Entiat District experienced a 15% increase and another 29.6% increase between 1990 and 2000. The Manson District experienced a 61.5% increase and another 31.4% increase to 477 full time enrolled students.

The Wenatchee School District grew by 21.1% to 6768 students in 2000. The Cascade School District grew by 18.5% in 1990 and another 278 students (21.7%) between 1990 and 2000. During the same period, the Cashmere School District increased enrollment by 24.6% to 1386 students.

Minority Distribution

There are numerous challenges in collecting cultural data, including, cultural changes affect how individuals classify themselves or how they want to be seen by others. Additionally, changes in how demographic information is collected and tracked, through the US Census, have occurred making it difficult to compare census data. The following tables from 1990 and 2000 provide a

glance at Census demographics. Numbers will not make population projections due to varying response rates.

1990 US Census Data

	Census CCD Areas								Totals
	Cashmere	Chelan	Entiat	Leavenworth Lake Wenatchee	Malaga	Manson	Stehekin	Wenatchee	
P009: Hispanic Origin									
Not of Hispanic origin	8018	4329	1344	4276	2347	1745	124	25281	47464
Hispanic origin:									0
Mexican	823	562	153	102	235	551	0	1894	4320
Puerto Rican	1	1	1	1	1	0	0	17	22
Cuban	0	0	0	0	0	0	0	12	12
Other Hispanic	50	57	9	9	25	13	0	269	432
P007: Detailed Race (part)									
White	8517	4357	1378	4278	2433	1882	121	25367	48333
Black	6	4	4	7	1	2	0	56	80
American Indian, Eskimo, or Aleut	39	38	35	47	22	22	2	282	487
Asian	17	27	1	11	8	6	1	240	311
Pacific Islander	313	523	89	45	144	397	0	1528	3039
White	8517	4357	1378	4278	2433	1882	121	25367	48333

2000 US Census Data

	Census CCD Areas								Totals
	Cashmere	Chelan	Entiat	Leavenworth Lake Wenatchee	Malaga	Manson	Stehekin	Wenatchee	
Total Population:	10,824	6,222	2,138	5,902	3,506	3,248	98	34,678	66,616
Not Hispanic or Latino:	8,658	4,865	1,734	5,632	3,049	2,044	98	27,642	53,722
<i>White alone</i>	8,330	4,654	1,637	5,453	2,994	1,960	95	26,422	51,545
<i>Black or African American alone</i>	14	27	5	0	4	0	0	64	114
<i>American Indian and Alaska Native alone</i>	108	65	38	70	6	37	3	301	628
<i>Asian alone</i>	29	23	24	11	24	8	0	293	412
<i>Native Hawaiian and Other Pacific Islander alone</i>	17	0	0	0	0	0	0	12	29
<i>Some other race alone</i>	5	21	0	10	0	3	0	9	48
<i>Two or more races</i>	155	75	30	88	21	36	0	541	946
Hispanic or Latino:	2,166	1,357	404	270	457	1,204	0	7,036	12,894
<i>White alone</i>	946	464	103	148	152	410	0	2,029	4,252
<i>Black or African American alone</i>	0	0	3	0	0	3	0	73	79
<i>American Indian and Alaska Native alone</i>	43	10	2	17	0	4	0	51	127
<i>Asian alone</i>	0	0	0	0	0	0	0	5	5
<i>Native Hawaiian and Other Pacific Islander alone</i>	0	0	0	0	0	6	0	0	6
<i>Some other race alone</i>	1,156	878	263	105	280	744	0	4,457	7,883
<i>Two or more races</i>	21	5	33	0	25	37	0	421	542

US Census Bureau 2000: P7. HISPANIC OR LATINO BY RACE [17] - Universe: Total population

POPULATION PROJECTIONS

The Office of Financial Management released population projections in February of 2008. These projections provided three alternative growth scenarios for Chelan County and the incorporated cities to consider; a high, medium, and a low projection. The cities and the County chose to plan for the high projection, as they felt it best matched the high rates of growth being experienced within the County and would provide sufficient room for growth in the twenty year planning period without artificially inflating development costs. It is essential to consider these numbers

in order to meet the requirements of the Growth Management Act (GMA) in addressing the minimum/maximum population.

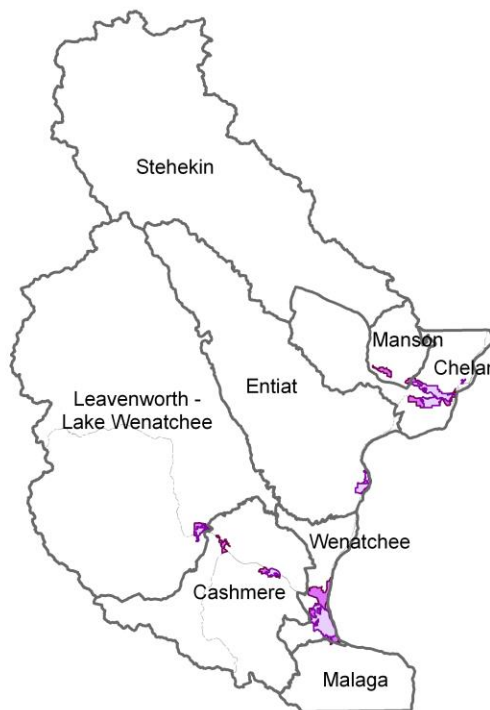
There are eight county census divisions within Chelan County. Table 4 illustrates the population growth projected within each of the county census divisions, utilizing the high series population projection from the Office of Financial Management. The Chelan County 'High Series' population number for the year 2030 was distributed to each of the eight Census County Divisions (CCDs) in Chelan County. The distribution was based on a historical trend of each CCD's percentage of the total county population. In order to give more emphasis to more recent counts, a weighted average was used. This weighted average used the following factors: 1970 Census, 10%; 1980 Census, 20%; 1990 Census, 30%; 2000 Census, 40%. This method of regional population distribution was reviewed and agreed upon by the cities and the county.

With the adoption of urban growth areas and the designation of rural and resource lands, historic growth rates within the census county divisions are intended to shift with the majority of growth being accommodated by those areas which have adequate facilities and services to accommodate the projected growth. Table 4 notes the population projection allocations by area, to the year 2030.

TABLE 4: CCD Populations

CCD Boundary	Population	
	1990 ¹	2000 ²
Cashmere	8,892	10,824
Chelan	4,949	6,222
Entiat	1,507	2,130
Leavenworth – Lake	4,388	5,902
Wenatchee		
Malaga	2,608	3,506
Manson	2,309	3,248
Stehekin	124	106
Wenatchee	27,473	34,678
TOTAL Countywide	52,250	66,616

¹ US Census P003; ² US CensusDP-1



The CCD's are used as the initial means of dividing County-wide population projects, as determined by the Office of Financial Management (OFM). Each CCD was assigned a percentage of the County growth then, using a ratio urban/rural split, each designated Urban Growth Area or LAMIRD was assigned a percent of the expected population. This division of growth was agreed to by the County and most cities in 2002.

Table 5 identifies the County growth from 2008 to 2030, as 35,077 people, and uses the CCD division of population growth and the urban/rural split to identify the growth throughout the County. While other CCD's only have one UGA or LAMIRD within its boundary, the Cashmere CCD divides its urban growth among three distinct areas: Cashmere, Peshastin and Monitor (see Table 6).

Table 5: Population Divisions Projected Growth

CCD	% of County Growth (2002 Agreement)	2008 - 2030 Population Growth OFM Projections (High)	Target Split Urban/ Rural %	Rural Split	Urban Split
Cashmere	16.780%	5,886	60/40	2,354	3,532
Chelan	9.404%	3,299	70/30	990	2,309
Entiat	3.060%	1,073	65/35	376	698
Leavenworth – Lake Wenatchee	8.299%	2,911	60/40	1,164	1,747
Malaga	4.674%	1,639	90/10*	574	1,066
Manson	4.495%	1,577	90/10**	158	1,419
Stehekin	0.214%	75	n/a	75	n/a
Wenatchee	53.074%	18,617	90/10	1,862	16,755
TOTAL	100.000%	35,077		7,552	27,525

* Consistent with Malaga Vision Plan projections; ** Consistent with Manson Subarea Plan 2009 (2002 agreement showed a 60/40 split)

Table 6: Current and Future Population Estimates

Urban Areas	Estimated Growth	2008 Estimated Population	2030 Estimated Population
Cashmere UGA	1476	2,990	4,466
Chelan UGA	2309	4,060	6,369
Entiat UGA	698	1,160	1,858
Leavenworth UGA	1747	2,295	4,042
Malaga LAMIRD	2620	2,030	4,650
Manson UGA	1419	1,685	3,104
Monitor LAMIRD*	1,573	190	1,763
Peshastin UGA	483	697	1,180
Stehekin	75	60	135
Wenatchee UGA	16,755	30,810	47,565

*2008 Population based on ACG Land Use (76 SF parcels *2.5 PPH); **Calculated annual growth rate based on Malaga Vision Plan 5.5% annually

The Stehekin Census County Division contacts no urban area therefore growth is only expected in the rural lands. The National Park Service estimated the 1995 year round population to be 70-90 persons and the seasonal population to be 175-190 persons during the peak season. In addition, the Park Service has estimated that the 2010 population for the community of Stehekin may reach 122 year round residents and up to 399 seasonal persons during the peak season. This

rate of growth is higher than what the County projects and does not appear to be consistent with available land or permit applications.

Critical Facilities

Critical facilities are services and facilities that may include water systems, sanitary sewer systems, storm-water facilities, schools, parks and recreational facilities, law enforcement and fire protection facilities. Critical facilities play a vital role in how the County grows, the quality of life, and the stability of the local economy. The primary driver for planning and development of public facilities is the growth projected for the County. Public facilities should be planned to support the projected growth and distribution of land uses. Public facilities in the County's urban growth areas should be provided at a level that can support urban densities and encourage urban in-fill. Public facilities in rural areas should be provided at levels reflecting the reduced demands and higher costs of serving these lower density, more dispersed patterns of development.

Inventory/Planned Improvements of Capital Facilities within Chelan County

The following discussion generally describes critical facilities that are used in providing public services within Chelan County and includes water systems,

WATER SYSTEMS

Domestic water in Chelan County is provided through several hundred private and public sources. A "public water system" means any system, excluding a system serving only one single-family residence and a system with four or fewer connections all of which serve residences on the same farm, providing piped water for human consumption, including collection, treatment, storage, or distribution facilities used primarily in connection with such system (WAC 246-291-010). The Chelan-Douglas Health District classifies a "Group A" system as serving 15 or more connections, regardless of the number of people, or a transient business with 25 or more customers per day. A "Group B" system serves less than 15 connections. A 2 party system is a public system but is exempt from the requirements for a "Group B" water system. The larger public water systems operated by public entities include the following:

Chelan County Public Utility District (PUD):

In 2001 the Chelan County PUD completed a Comprehensive Water Utility Plan. The Wastewater Comprehensive Utility Plan was completed in 1994. Locations, capacities, deficiencies and proposed improvements of water/wastewater system components are identified. For inventory purposes this plan is referenced for this comprehensive plan.

Chelan County PUD has developed a satellite management (SMA) program to assist utilities with their technical and administrative tasks, minimize extended water outages and other issues associated with water and wastewater systems. The SMA provides water and wastewater utilities with an avenue to receive assistance for their utility regulations, operation and

maintenance needs and provide a variety of other functions. The PUD has signed a Memorandum of Understanding with Chelan County to provide satellite system management services. PUD water systems are included in the following:

Wenatchee Regional Water System:

The primary source for the Wenatchee area is a high yield groundwater aquifer. In 1979 the Chelan County PUD entered into a contract with the City of Wenatchee for joint development of a Regional Water Supply System utilizing the groundwater aquifer adjacent to Rocky Reach Dam as a source of water. This new system was completed and placed into operation in 1983. East Wenatchee Water District was added as a partner to Regional Water Supply System in 2001. The City of Wenatchee operates and maintains the regional wells and water mains.

The system includes four wells capable of producing up to 20 million gallons per day (MGD) and approximately 10 miles of 30-inch diameter pipe delivering water from the Rocky Reach aquifer. Water is introduced into the District's system at three metering points: Lincoln Rock State Park, Olds Station and Hawley Street. The District's five wells, previously used as the primary source of water, are now used as a standby supply system for emergency backup:

The regional water system services commercial, industrial and residential land uses. There are currently approximately 4200 connections on the system. Approximately 6000 connections are projected through the year 2020. The District, in conjunction with the City of Wenatchee and East Wenatchee Water District, are entitled to receive delivery of up to 36 (MGD) from the Regional System. Peak demand for the Wenatchee area through the 2020 Water Plan horizon is 6.2 MGD.

The PUD's portion of the water system serves Sunnyslope, Olds Station, and the outer western and southern boundaries of the greater Wenatchee area. The system was extended to the Wenatchee Heights area in the 1970's and is available along Squilchuck Road up to the Forest Ridge development. On the north end of Wenatchee, service was extended to the Sleepy Hollow area in 1997. Several reservoirs, booster pumps, and water mains are currently being installed to upgrade the Sunnyslope area.

Chelan County PUD - Chelan Falls Water System:

The Chelan Falls water system is located along the Columbia River, southeast of the City of Chelan in the southwest portion of Township 27 N. and Range 23 E. The system is located primarily along the Columbia River. In 1987, the PUD assumed maintenance and operation of the system, which is owned by the Chelan Falls Water District. Two wells, a pump station, a storage tank, and approximately 15,000 lineal feet of 6-inch diameter distribution mains serve approximately 120 connections. The two wells, named No. 1 and No. 2 serve the Chelan Falls water system. Located north of the distribution system, the wells are connected in series to the reservoir by a 6-inch PVC line.

Water rights for the Chelan Falls water system are covered by Certificate G4-27862. The PUD is authorized to withdraw 1,350 gallons per minute at any given time, not to exceed a total yearly

withdrawal of 300-acre feet (97.8 million gallons per year). Current pumping records indicate that approximately 36.2 million gallons of water per year are being pumped at Wells No. 1 and No. 2. This amount is only about 37 percent of the total water right for the system. Clearly, adequate water rights exist to meet the needs of the Chelan Falls system through 2020.

Chelan County PUD - Chelan Ridge Water System:

The Chelan Ridge Water System is located on the south shore of Lake Chelan near the intersection of Navarre Coulee Road and South Lakeshore Road. The system consists of a water treatment plant, a 100,000 gallon reservoir and distribution system. There are approximately 20 service connections plus the State Park.

The system has a capacity of 90 E.R.U.s (equivalent residential units) with 30 of these allocated to the Lake Chelan State Park. The estimated future demand for the system is 90 E.R.U connections.

Chelan County PUD - Olalla Canyon Water System:

The Olalla Canyon water system is located in Olalla Canyon just west of the City of Cashmere and North of U.S. Highway 2. The system consists of a well, 100,000-gallon reservoir and distribution system.

The system currently has 30 connections and is limited to this number due to water right restrictions. There are no plans for additional users on this system. Any future expansion of this system to accommodate additional users would require acquisition of additional water rights.

Chelan County PUD - Dryden Water System:

The Dryden water system is located along the Wenatchee River in Dryden. The topography of the system does not exhibit tremendous changes in elevation over short runs. The system is supplied by two submersible pumps installed in wells that are about 150 feet from the Wenatchee River, near the State highway bridge. The system is currently, operating well below the established water right of seventy four-acre feet water per year. A single 100,000-gallon capacity reservoir serves the water system.

The distribution system at Dryden consists of approximately 7,200 lineal feet of 6 inch and 8 inch mains. The service area map and detailed system description are located in the *Chelan County PUD No. 1 Water and Wastewater Utility Plan, Volume No. 2*. Currently, there are 61 connections on the system. It is projected that there will be 82 connections by the year 2020.

Lake Chelan Reclamation District Water System:

The domestic water system for the community of Manson was purchased by the Lake Chelan Reclamation District (LCRD) in February of 1922. The system has two intakes in Lake Chelan, one raw water reservoir, a Water Treatment Plant, two finished water reservoirs and over 47 miles of distribution system. The system serves approximately 1350 connections and a peak

tourist population of 5,500 in the summer months. Connections are projected at 2,549 in the year 2025 with an estimated peak tourist population served of approximately 8,500.

The area served by the LCRD domestic water system is a mixture of commercial agriculture, rural residential and urban residential and commercial land uses. Agricultural and rural residential usage is the dominant land use while the remaining uses are located within the Manson urban growth area.

The LCRD has an approved Domestic Comprehensive Plan for the system, dated January 2000, that includes a description, analysis and proposed improvements to the system, and is adopted by reference as part of this comprehensive plan. This LCRD Plan was designed to be in concurrence with the Chelan County Comprehensive Plan.

Malaga Water District:

The Malaga Water District service includes the Malaga and Stemilt area. There are several small water systems within its boundaries, the largest being the Three lakes Water District and Stemilt and the Stemilt Irrigation District Domestic system.

The system consists of 2 wells, 3 booster stations,,6 reservoirs and approximately 16 miles of distribution line located along the Malaga-Alcoa Highway, West Malaga Rd., Joe Miller Rd., Hamlin Rd. and Crown Ln. with a spur to the Stemilt Hill Rd. at the Stemilt Growers warehouse.

There are currently 310 connections on the system. The system capacity is 700 to 1,000 connections. The future projected demand for the system is 1200 connections through the year 2014. Up to thirteen miles of additional water lines are needed for future projected demand.

The District is working on updating the Malaga Water District 1994 Comprehensive Plan, prepared by Forsgren and Associates. The Malaga Water District Plan is adopted by reference as part of this comprehensive plan. The draft 2002 plan is currently being reviewed by the Department of Health.

Three Lakes Water District:

The Three Lakes Water District wells are located on Tract B of the Three Lakes Subdivision with a nearby reservoir. The system includes two wells with a looped distribution system and a 100,000-gallon concrete reservoir.

There are currently 240 connections on this system, including potable water to the Three Lakes Golf Course and one additional connection outside of the subdivision. The system capacity is 280 connections. Eventual possible build-out for the Three Lakes Subdivision would include a total of 333 connections. To serve this demand, more reservoir storage capacity and additional water permitting would be required through the Washington State Department of Ecology. Permits were applied for in 1991 and 1992 and are still pending.

City of Chelan Water System:

The City of Chelan operates a water filtration plant, and a water distribution system serving customers inside and outside of the city limits. The water filtration plant became operational in 1999 and brought the City's water supply into compliance with state and federal requirements. In general, the water system supplies potable water to the customers within or abutting the city limits. The water system also supplies potable water to the Chelan River Irrigation District and to the Isenhart Irrigation District. Per the City's August 2001 Water System Plan, Average Daily Demand (ADD), and Maximum Daily Demand (MDD) were forecast as follows, including the Chelan River Irrigation District and Isenhart Irrigation District:

	ERU	ADD(gpd)	MDD
Present	2895	1339k	3883k
2021 Est.	5664	2622k	7640k

Present capacity of the Supply source and WTP is 6,700,000 gpd. Planned enhancements to the system within the 20 year Planning period will raise this capacity to 10,000,000 gpd.

City of Leavenworth Water System

The City of Leavenworth addressed the City Water System in its comprehensive plan amended and adopted August 13th, 2002 and is adopted by reference for this comprehensive plan. Action Item #8 within the Critical Facilities Element of the Leavenworth Comprehensive Plan disallows, with some exceptions, additional connections to the City of Leavenworth Water System outside of the urban growth area or the incorporated city limits. Currently there are 339 water connections to this system outside of the urban growth area. These connections are along the Icicle Road and in the East Leavenworth area.

The City of Leavenworth water system consists of City owned and operated water supply, storage, treatment, transmission and distribution facilities. The water supply is from both surface and ground water sources. The present system serves 1223 customers with seventy-five per cent inside of the City limits, evenly divided between residential and commercial demand. The total water service population is 3055. The City of Leavenworth has updated the Comprehensive Water Plan, produced by Verela and Associates, scheduled for adoption late in 2002. Locations, capacities, deficiencies and proposed improvements of system components are identified in this plan.

The following summary inventory describes the present Leavenworth water system.

<u>Description</u>	<u>Size, Capacity or Length</u>
Supply: Icicle Creek WTP	2.9 MGD
Well No. 1	1.8 MGD
Well No. 2	1.0 MGD
Storage: Concrete Lined Reservoir	700,000 Gallons

Transmission:

Icicle Creek 16" & 12"	4.5 Miles
East Leavenworth Rd. 10"	3.0 Miles

Distribution:

4" - 10" DI, STL	8.8 Miles
Services	1,100

Currently the City of Leavenworth has surface water rights to 3.02 cubic feet per second (CFS) from Icicle and Wenatchee Rivers (1.96 MGD), and groundwater rights to 1,000 GPM (gallons per minute) or 1.44 MGD. Total Municipal Water Rights allow for 2.359 gpm (3.4 MGD). Interruptible Water Rights allow for 2 MGD. Present maximum total system water demand is approximately 1.84 MGD (1.278 GPM on a 24-hour average basis).

Future Needs: The Leavenworth Urban Growth Area share of the Office of Financial Management (OFM) projected population growth is approximately 2,900 people through 2025. The City has adequate water rights to serve this population, however, there is a deficiency in flow due to substandard pipe size. The 4-inch water lines need upgraded to 8-inch water lines to increase flow. The Icicle Road/SR2 water main needs to be upgraded from a 12-inch to a 16-inch ductile iron (DI) pipe. The East Leavenworth water main needs to be upgraded from a 10-inch to a 12-inch line. A 12-inch water transmission line, a 12-inch main, and a reservoir in the Ski Hill area will need to be developed to serve projected urban growth. Details of water system improvements are located in Appendix C of the Leavenworth Comprehensive Plan.

Peshastin Water District:

The Peshastin Water District owns and operates the water system that serves the community of Peshastin, located along the north side of the Wenatchee River three miles east of Leavenworth.

The water source for the system includes four wells. The system includes two, 250,000-gallon reservoirs storage tanks located on the District's property northeast of Peshastin. The water system is operated by gravity feed. The system includes four miles of pipe of various sizes, from 1 to 12 inches.

There are 221 service connections. The system is approved for 430 connections, which is sufficient to serve the projected future demand of 241 connections through the year 2018.

The District is currently in the process of an extensive water system replacement project. The project includes replacement of all pipes, well house improvements, meter installation on all connections, cistern replacement, rebuilding one well house, and construction of a new well/reservoir control system. This project will be funded by Rural Development, Community Investment Funds, Public Works Trust Fund, and local matching funds. The district has approved the preliminary engineering report and the project is expected to go to bid during the winter months with construction to begin in spring of 2003 with completion by late summer of 2003.

There is possible service extension in the “old mill” property. Water rights have been settled and the District owns water rights to that property. The property is in the process of being sold to the Port of Chelan County for possible development of an Industrial Park. Possible connections are estimated at 75.

The Water System Plan for Peshastin Water District was prepared by Chelan Count PUD and has been approved by the State Department of Health. This plan is adopted by reference for this comprehensive plan.

Alpine Water District

The Alpine Water District was formed in late 1999. The customers purchased the water system which was built by the Chelan County Public Utility District (PUD). Rh2 did a feasibility study for the PUD to address an expanded system that would serve all of the populated area around Lake Wenatchee.

The system includes a source well and pump near the east end of Lake Wenatchee. Six inch mains extend 13,800 feet from the source along Chiwawa Loop Road to the 100,000 gallon storage tank located near Alpine Tracts, and 5,800 feet fro the entrance to the State park along the Lake Wenatchee Highway and the North Shore Road.

The system serves Alpine Tracts, the YMCA camp, Midway Village residential, and Lake Wenatchee State Park. There are currently 58 customers connected to the system. The District is pursuing additional connections. The reservoir is capable of handling 50 more customers.

Other major public water systems in the Plain/Lake Wenatchee area are currently owned and operated by private user associations or individuals. Public water systems actually owned and operated by public agencies include forest service facilities and state campgrounds, and WSDOT facilities.

The following table shows other larger existing public water systems in the Plain/Lake Wenatchee Area..

WATER SYSTEM	TYPE	CONNECTIONS	SOURCE
Chiwawa Comm. Assn.	A COMM	320	4 Wells
Ponderosa Comm. Club Inc.	A COMM	385	Well
Thousand Trails Water System	A TNC	271	Surface Water

Little Butte Water System

The Little Butte Water System is owned and operated by the Little Butte property Owner’s Association. With water rights to pump from Lake Chelan and serving 46 lots on approximately 906 acres located approximately one mile up Chelan Butte Lookout Rd. the system is composed of a lakeside pump house, filtration plant, a 96,000 gallon reservoir and distribution lines.

There are currently 30 authorized hookups. Future demand is anticipated to total 60 hookups, accomplished in two phases with 16 more hookups when authority is granted from the state to the original platted lots (phase I) and 14 additional hookups (phase II) by the year 2017. This is anticipated to include a new reservoir to serve properties at higher elevations.

There are currently 30 authorized hookups. Future demand is anticipated to total 60 hookups, accomplished in two phases with 16 more hookups when authority is granted from the state to the original platted lots (phase I) and 14 additional hookups (phase II) by the year 2017. This is anticipated to include a new reservoir to serve properties at higher elevations.

IRRIGATION SYSTEMS

In addition to some irrigation usage of domestic water, irrigation water in Chelan County is provided through several sources. Irrigation purveyors in Chelan County are included below.

Pioneer Water Users Association:

The Pioneer irrigation system supplies water for irrigation use only to agricultural and residential customers. The system serves an area between Monitor and the City of Wenatchee including some area inside the Wenatchee City Limits. The system's capacity is 15 cubic feet per second (CFS). The system serves 96 customers with no future expansions anticipated for the system. Planned Improvements include ongoing maintenance.

Icicle Irrigation District:

The Icicle Irrigation District provides irrigation water only. The intake for the system is located on Icicle Creek five miles up Icicle Canyon Road from Highway 2 and serves from there to Monitor along both sides of Highway 97. The system serves approximately 425 customers with approximately 800 parcels of land. The capacity of the system is 117.71 CFS set by available water rights. No expansion of the system is anticipated; however habitat improvements and ongoing maintenance are planned for the system.

Lake Chelan Reclamation District:

The Lake Chelan Reclamation District (LCRD) was organized on May 8, 1920 under Title 87 RCW and provides irrigation water to 6,600 acres of land along the north shore of Lake Chelan from Green's Landing down-lake to just east of the City of Chelan.

The LCRD system provides pressurized water to 660 connections along 73 miles of distribution system with an instantaneous capacity of 106.7 cfs and an annual right of withdrawal of 22,388 acre-feet during the months of March to October each year. System expansions are limited by contract within the LCRD boundary and the system is presently at its acreage capacity. Planned improvements are operations and maintenance oriented.

Peshastin Irrigation District:

The Peshastin Irrigation District system serves irrigation use only. The intake for the system is located three miles up Peshastin Creek from the junction of Highway 97 and Highway 2, serving from that point to Pioneer Dr. at Cashmere.

There are approximately 400 customers on the Peshastin Irrigation District system with approximately 800 parcels of land. The capacity of the system is set by water rights at 42 CFS. No expansion to the system is anticipated. Planned improvements to the system include ongoing maintenance.

Spring Hill Irrigation Company:

The Springhill Irrigation Co. is operated and managed by the Wenatchee Heights Recreation District. The capacity of the system is 300-acre feet (AF) annually set by existing water rights, plus 500 miner's inches of 5th water right from the Stemilt Creek watershed

Recent improvements to the system included 100-year flood condition standard improvements and ongoing maintenance work. During dry years there is a need for additional water in this area.

Wenatchee Heights Water Company

The Wenatchee Heights Water Company is operated and managed by the Wenatchee Heights Reclamation District. It serves approximate 15 customers. The capacity of the system is 600 acre feet (AF) annually. Currently there are no plans for expansion of the system.

Wenatchee Heights Reclamation District:

The Wenatchee Heights Reclamation District lies approximately three air miles south of Wenatchee, on a plateau about two thousand feet above Wenatchee, in Sections 34,35,25,and 26, Township 22 N., Range 20 E. The system serves 52 customers within the district and approximately 15 customers outside of the district boundaries. Approximately 750 acres of land are served by the District.

The capacity of the Wenatchee Heights Reclamation District system is 1500 acre feet annually. In 1994 a request to expand the system was forwarded to the Washington State Department of Ecology. This request is still pending.

Wenatchee Reclamation District:

The Wenatchee Reclamation District provides irrigation water diverted from the Wenatchee River at the Dryden Dam. The Distribution system includes a system of canals, flumes and tunnels going from the dam site through Sunnyslope and to the Columbia Lateral, and through the City of Wenatchee in the Highline Canal. The system crosses the Columbia River at the footbridge and proceeds on to East Wenatchee to the top of Ninth Street, with distribution north to 38th street and distribution south to Rock Island.

The Dryden Dam diversion area includes the first 11,500 feet of the distribution system that is operated and maintained by the Chelan County Public Utility District. The Wenatchee Reclamation District's operations begin near Williams Canyon. With a capacity set by water rights limits of 200 CFS the system serves over 9,000 customers and approximately 12,500 acres in Chelan and Douglas Counties.

In 1988 Kyle Rumble completed a report outlining improvements to the system, which have since been completed. There are no anticipated expansions to the system or customer base. Planned Improvements include normal ongoing maintenance.

Greater Wenatchee Irrigation District

The Greater Wenatchee Irrigation District serves 54 Chelan County customers in the Howard Flats area near the Chelan Municipal Airport. The capacity of the system is 5,000 AF annually. There are no plans for expansion of the system. A system plan that was completed in 1986, by CH2M Hill, outlined needed system improvements. Improvements were completed in 1989. Ongoing improvements include maintenance and improvements in telemetry.

Cascade Orchard Irrigation Company, Inc.

The Cascade Orchard Irrigation Company serves approximately 200 customers and 500 acres along the Icicle Valley up to the Fish Hatchery Canal at the intersection with the Wenatchee River. Any expansion to the system would be internal, limited by the boundaries of the plat. An engineering study was begun in 1999 by the firm Geomax, located in Spokane WA. The report recommended continuing upgrading the main canal and to keep it open. It serves as a water barrier for flood control, controlling seepage from uphill). It also provides water for firefighting, recharges wells, and provides a barrier for rattle snakes. Conservation methods have reduced demand and will enable the system to meet foreseeable demand from growth.

Entiat Irrigation District

The Entiat Irrigation District has 850 shares serving approximately 800 acres in and around the City of Entiat, extending approximately 1 mile up the Entiat River from the city. The system delivers water with a minimum of 40 pounds of pressure, and the board feels that the system is pumping at capacity.

The system delivers only irrigation water. Some conversion from orchard to housing is anticipated. Planned Improvements include piping replacement and updating of the pump house. Computers and valve assemblies are also gradually being replaced.

Isenhardt Irrigation District

The Isenhardt Irrigation district serves 26 equivalent residential users with irrigation water east of the City of Chelan and east of Highway 150, on both sides of Highway 97 Alt. The capacity of the system is 4 CFS, including domestic and irrigation usage.

Lower Squilchuck Irrigation District

The Lower Squilchuck Irrigation District serves irrigation 9 customers along Methow Street south of the City of Wenatchee out to the Lovitt Mining Company Orchards, including the Heath Development. The capacity of the system is 1,100 CFS. No expansion of the system is anticipated, as the system is limited to existing water rights. Recent improvements have included major piping replacement.

Sunnyslope Irrigation Company

The Sunnyslope Irrigation Company serves 48 users in the vicinity of American Fruit, Crestview and Lovell and Knowles Roads in the Sunnyslope area. The capacity of the system is 2,400 GPM and could be expanded to 3200 GPM if service area were expanded. About one third of the area is currently in orchards, with the remaining likely to be developed into residential use. Future demand will be met with the capacity of the system. Another pump will be added to attain full capacity within 5 to 7 years.

Sleepy Hollow Water System (aka Warm Springs Irrigation)

The sleepy hollow serves irrigation water to Short subdivision # 1755 and 1754, Sleepy Hollow Estates, Phases I and II and one other adjacent property. The system also provides a secondary source of water for fire protection to SS # 1754 and Sleepy Hollow Estates Phase I and II. The water permit is for 2 CFS, 512 AF per year between April 15, and October 15 of each year. There are presently 26 users of the system, representing 70% of the shares. When fully utilized, there will be 48 users, which is the designed capacity of the system.

Lower Stemilt Irrigation District

The Lower Stemilt Irrigation District serves 11 customers in the Stemilt Creek Basin. The capacity of the system is 5,730 GPM with no expansion to the system planned. System improvements include ongoing upgrading of system and normal maintenance.

Chelan Falls Irrigation District

The Chelan Falls Irrigation District serves 30 customers at the south end of Chelan Falls, and along the Columbia River south to the end of the Dovex Property. The system was upgraded in 1995-96 with new piping and was pressurized, operating now at 120 PSI. The system capacity is 15 CFS by agreement with Chelan County PUD. There are no plans for expansion of the system. Ongoing improvements include normal maintenance.

Wenatchee-Chiwawa Irrigation District

The Wenatchee-Chiwawa Irrigation District serves approximately 1300 acres near the town of Plain in the Plain Valley. The system serves approximately 300 customers and has a capacity of 33.3 CFS withdrawn from the Chiwawa River. There are no plans for expanding the system. Planned improvements to the system include ongoing maintenance

Beehive Irrigation District

The Beehive Irrigation District is located on both sides of Squilchuck road, Northeast of Squilchuck State Park. The district serves 63 irrigation customers owning 223 shares. There are no plans for expansion to the system. Planned improvements to the system include general maintenance.

SANITARY SEWER SYSTEMS

On site sewage disposal is the anticipated method for treatment of wastewater in the rural portions of Chelan County due to lower population densities and the prohibitive associated costs of providing treatment plant capabilities.

In 1994 the Chelan County PUD completed a Wastewater Utility Plan. Locations, capacities, deficiencies and proposed improvements of water/wastewater system components are identified. For inventory purposes this plan is referenced for this comprehensive plan.

Chelan County PUD has developed a satellite system program to assist utilities with their technical and administrative tasks, minimize extended water outages and other inconveniences associated with emergency conditions. This is to ensure that customers are receiving safe and satisfactory water and wastewater service, and provide a variety of other functions. The PUD has signed a Memorandum of Understanding with Chelan County to provide satellite system management services. PUD wastewater systems along with other wastewater treatment systems outside of incorporated areas and their associated urban growth areas are included in the following:

Chelan County Public Utility District - Olds Station:

The Olds Station wastewater system serves 46 primarily commercial and industrial customers in the Sunnyslope/Olds Station area. The wastewater system consists of a gravity collection system containing approximately 16,000 lineal feet (3.03 miles) of 6 to 15-inch diameter sewers; a duplex pump station; and 11,300 feet (2.14 miles) of 12-inch diameter force main. The force main discharges to the City of Wenatchee collection system. The PUD is charged by the City based on the quantity and strength of the discharged wastewater.

The system is a collection system that conveys wastewater from Olds Station to the City of Wenatchee for treatment. Therefore, system deficiencies for Olds Station are related to the system's ability to collect and transport wastewater. Additional capacity will need to be negotiated with the City of Wenatchee or a new treatment facility is required to provide additional wastewater service beyond the current agreement between the PUD and the City of Wenatchee. According to the PUD *Water and Wastewater Utility Plan*, the Olds Station sewage pumps or pump station may require an overhaul or upgrade to larger pumps if sewer service is extended into Sunnyslope, or if industrial growth exceeds the present pumping capacity of the system.

The existing wastewater flow capacity that Olds Station can transport to the City of Wenatchee sewage treatment plan, as specified under their service agreement, is 810,000 gallons per day (gpd). The present average wastewater flow through the Olds Station system is approximately 430,000 gpd. Peak daily flows have been significantly higher than the 430,000-gpd average; however, the PUD believes a significant portion of the system capacity is not presently being used. The *Water and Wastewater Utility Plan* contains an inventory of the locations, capacities, deficiencies and planned improvements of the Olds Station Wastewater System.

Additional system capacity may be needed for the Olds Station system if wastewater service is extended into Sunnyslope to serve the Urban Growth Area. A joint effort by Chelan County, Chelan County PUD and the City of Wenatchee is being considered to study expanded wastewater collection and treatment for the Sunnyslope Area.

City of Chelan Sanitary Sewer System:

The City of Chelan operates a sewer collection system and two waste water treatment plants (WWTP). The sewer system receives sewage from city customers as well as the Lake Chelan Reclamation District (LCRD) on the north shore of Lake Chelan and from the Lake Chelan Sewer District on the South Shore.

The demarcation line between The City sewer service and LCRD sewer service is approximately the down-lake tip of Rocky Point on SR 150. Customers up-lake from this point are served by LCRD and customers down-lake are served by the City of Chelan. It is approximately one mile down-lake from Rocky Point to the City Limits.

The LCSD is administered by the City of Chelan. All of the LCSD customers are in the County. With the recently completed extension, this system collects sewage from approximately on mile up-lake of Minneapolis Beach back to Chelan along SR 971 and SR 97A.. The Chelan County PUD no longer has an interest in this system.

Per the City's Wastewater Facility Plan, published in Feb. 2000 and adopted herein by reference, the Phase I upgrades to the wastewater treatment plant (completed in 2002) will result in a plant capacity of 1.77 million Gallons per day (mgd). Phase II improvements scheduled to commence in year 2008 or as required by growth would result in a capacity of 2.66 mgd. The City's average and maximum sewer flows at present and in 2021 were calculated as follows.

	LCSD	LCRD	CITY	TOTAL
Present average:				
ERU	235	1265	3076	
Avg. total GPD	51k	171k	652k	874K
Estimated 2021 Avg.:				
ERU	369	215	7498	

Avg. total GDP	80k	291k	1590k	1961K
Estimated 2021 Max.:	215k	421k	2020k	2656K

Lake Chelan Reclamation District Sewer System:

Sanitary sewers were first installed in the Manson area in the late 1940's. The Lake Chelan Reclamation District (LCRD) became the successor in interest of facilities from several sewer entities between 1979 and 1994 and presently provides sewage collection and transmission services from Willow Point down-lake to Rocky Point including the urban growth area of the community of Manson. The system is comprised of several major lift stations and over 15 miles of collection and transmission pipelines. Sewage treatment is provided at the City of Chelan Wastewater Treatment Plant. The LCRD pays for a pro-rata share of operations and maintenance costs for treatment as well as Critical improvement costs to the City of Chelan for the wastewater treatment facility.

The LCRD system serves approximately 1,360 connections with a peak tourist population of 3,500 in the summer months. The existing capacity is 1,585 connections with construction planned in 2003 - 2004 to increase the capacity to the demand forecast for the planning period. Connections are projected at 2,266 in the year 2025 with an estimated peak tourist population served of approximately 5,700.

The area served by the LCRD sewer system is a mixture of commercial agriculture, rural residential and urban residential and commercial land uses. Rural residential usage is the dominant land use with a small amount of commercial agriculture while the remaining uses are located within the Manson urban growth area.

The LCRD has a draft General Sewer Plan and Northshore Wastewater System Improvements Facility Plan, dated October 2002, that includes a description, analysis and proposed improvements to the system, and is adopted by reference as part of this comprehensive plan. This LCRD Plan was designed to be in concurrence with the Chelan County Comprehensive Plan.

Chelan County Public Utility District Wastewater System – Dryden:

The Dryden wastewater system consists of a collection system and community septic tank and drainfield. The collection system consists of approximately 4,000 lineal feet of concrete and some PVC pipe. The treatment facility consists of two septic tanks each having a capacity of 23,000 gallons and three separate drainfields, each having approximately 3,400 feet of drainpipe. The system serves approximately fifty-five customers and receives an average daily flow of 24,000 gallons per day. The system service area map and details of the system components are located in the *Chelan County PUD No. 1 Water and Wastewater Utility Plan, Volume 3*, hereby referenced for inventory purposes.

The Dryden wastewater system has not experienced water quality problems to date. However, a possibility exists of future water quality problems as a result of the system's proximity to the Wenatchee River. Needed system improvements include replacing all old substandard pipes.

There is no identified capacity expansion needs at this time. The Critical Improvement Plan for the Dryden Wastewater Treatment System is located in Volume 3 listed above.

Chelan County Public Utility District Wastewater System - Peshastin:

The Peshastin wastewater system serves the community of Peshastin, located along the north side of the Wenatchee River three miles east of Leavenworth. The system is a step tank, force main collection system with a secondary treatment plant with discharge to the Wenatchee River.

The current demand on the system is 73,000 GPD. Currently there are 125 residential connections, 4 commercial connections, 2 industrial connections and 6 institutional connections. The projected demand is 110,000 GPD, through the year 2020, which is the design capacity of the system. A projection for the mix of types of future uses has not been made.

Chelan County Public Utility District Wastewater System - Lake Wenatchee:

The Lake Wenatchee area wastewater system, composed of collection and treatment facilities, is managed and operated by the Chelan County PUD in the District's role as a Satellite System Management Agency for Chelan County.

The Lake Wenatchee Wastewater collection system currently serves the Lake Wenatchee area including properties on the north shore along North Shore Drive west to the former location of the Cougar Inn, on south shore of the lake along South Shore Drive (Cedar Brae Road) west near Camp Zanika Lache, and around the outlet of the lake.

The collection system processes the wastewater from the customers using septic tank effluent pumping (STEP) systems with each tank serving approximately 1 to 3 lots. Effluent is pumped from each septic tank to collection lines and the solids are detained in septic tanks. Periodically, the tanks are pumped out and the solids are hauled to a licensed disposal site (currently in Douglas County) where they are spread and disked into the ground. Disposal sites have been readily available according to a licensed septic tank pumping contractor. Operation and maintenance of the STEP systems are the responsibility of the PUD. Not all residences with sewer availability or adjacent to the collection system are connected. This is their individual choice. New residents and properties with failing systems must hook up to the system.

The treatment facility is a lagoon/sand filtration system located near the intersection of Hwy 207 and the Chumstick Hwy., which is an upgrade of the old primary treatment system that was operated by the Forest Service. The system was designed to add incremental capacity as needed when additional users connect to the system.

The Lake Wenatchee/Fish Lake sector is the only portion of the Plain/Lake Wenatchee area that has the density, and water bodies to protect that indicates the need for a public wastewater system. Collection lines could be extended to serve other properties within this sector such as the Fish Lake area via the existing transportation corridors. Similarly, wastewater service can be extended to properties such as the State Park and Kahler Glen. Treatment facility improvements are in the process to increase plant capacity and will be completed in 2003.

The Plain area has a number of urban density subdivisions served by septic systems that may have the potential to impact the quality of the local ground water and the Wenatchee and Chiwawa Rivers. The extension of pipe and pump stations to the existing facility at Lake Wenatchee is cost prohibitive at this time.

Development of a public wastewater system serving the remainder of the area is unlikely due to low population growth and insignificant new development predictions for the next 20 years. Any new development in rural areas, outside of the Lake Wenatchee/Fish Lake sector, could be served by adequately designed and constructed on-site disposal systems.

Stehekin Wastewater Treatment - National Park Service:

The National Park service maintains a sewage treatment plant serving only the Stehekin landing area used for National Park Service businesses and residents at Stehekin Landing. Any increases to capacity will be the responsibility of the National Park Service.

The system includes gravity flow collection to a lift station that pumps to the treatment plant. The lift station was rebuilt in 1998. The plant's service capacity is 25,000 GPD and currently handles 15,000 to 18,000 GPD. The service area includes approximately 76 ERU (equivalent residential units).

There are no additional plans for expansion of the system as there are no projected increased demands for the system. Future improvements to the system involve maintenance of the system.

STORMWATER

The storm drain system for Chelan County's roads consists primarily of roadside ditches, with culvert pipes used to carry drainage under roads and driveway approaches. Drainage is typically carried in the roadside ditch to a point where it is directed to a natural drainage course.

In more urbanized areas, a limited number of piped drain systems are in place. These areas include Olds Station, Sunnyslope, Peshastin, Leavenworth, and Manson. The piped systems are located where it was necessary to construct a roadway with curb and gutter with catch basins.

The Chelan County Public Works Department has developed a Stormwater Management Plan for the Olds Station area that is adopted by reference for this comprehensive plan. The port of Chelan County is in the process of developing more storm systems in the Olds Station area.

To address potential problems associated with water runoff it is important to address stormwater with development standards at the time that development proposals are considered for approval.

SCHOOLS

Public schools in the County are administered through seven school districts. Not include in this inventory is a small portion of the Azwell School District lies with Chelan County. None of this

District's facilities are located within the County. School facilities within the seven districts include the following:

Chelan School District 129 Facilities:

Lake Chelan High School/Middle School, 215 Webster St., Chelan
105,000 sq. ft.
Enrollment: HS – 450 (includes MAC)
Enrollment: MS – 299

Morgan Owens Elementary School, 407 E Woodin Ave., Chelan
60,464 sq. ft.
Enrollment: 555

Lake Chelan School District Office, 303 E. Johnson, Chelan
4,107 sq. ft.

Community Gym, 1063 E. Woodin St., Chelan
24,995 sq. ft.

Bus garage/Locker rooms at football field, 1063 E Woodin St., Chelan
13,670 sq. ft.

Glacier Valley Alternative School/Nite Preparatory School, 324 E. Johnson Ave.
9,600 sq. ft.

At the present time there are no plans to provide additional facilities.

Manson School District 19 Facilities:

Administration Office, 312 Quetilquasoon, Manson
3,000 sq. ft.
Manson Elementary, 950 Totem Pole Road, Manson
41,600 sq. ft.
Enrollment: 312

Manson Junior/Senior High School, 1000 Totem Pole Road, Manson
76,612 sq. ft.
Enrollment: 296
Football field

Future needs for the district include updating of the transportation facility as well as the football field. Manson's enrollment is projected to remain stable.

Cascade School District 228 Facilities:

Cascade School District office, located at 330 Evans Street, Leavenworth, WA 98826

Beaver Valley School, 19265 Beaver Valley Road, Leavenworth, WA 98826

Peshastin-Dryden Elementary School, 10001 School Rd., Peshastin, WA 98847
Grades K-4 Enrollment: 178

John Osborn Elementary School, 225 Central Ave., Leavenworth, WA 98826
Grades K-4, Enrollment: 268

Icicle River Middle School, 10195 Titus Road, Leavenworth, WA 98826
Grades 5-8, Enrollment: 450

Cascade High School, 10190 Chumstick Hwy, Leavenworth, WA 98826
Grades 9-12, Enrollment: 518

The Cascade School District does not project any significant enrollment increase within the next five to ten years. Winton School was closed and replaced by Beaver Valley School in 2000 to accommodate grades kindergarten through 4th.

Entiat School District 127 Facilities:

Paul Rumberg Elementary School, 2650 Entiat Way
23,163 sq. ft. plus 2,400 sq. ft. in portable classrooms
Enrollment: 211

Entiat Junior/Senior High School, 2650 Entiat Way
23,855 sq. ft. including District office space
3,120 sq. ft.: Elementary and High school offices
9,263 sq. ft.: Multi purpose room
8,000 sq. ft. Helen Kinzel Gymnasium
484 sq. ft. Concession stand
Enrollment: 173

Bus Garage - 13580 Davis St., Entiat
4,285 sq. ft.

The Entiat School District projects enrollment to be 450 in the year 2006/7. In 3 to 5 years the District anticipates building one new school on the existing 25-acre school site to accommodate this demand.

Cashmere School District 228 Facilities:

Vale Elementary School, 101 Pioneer Ave., Cashmere

Cashmere Middle School, 300 Tiger Road, Cashmere

Cashmere High School, 329 Tiger Road, Cashmere

Bus Garage, 103 Paton Street, Cashmere

Superintendents Office, 210 S. Division, Cashmere

Maintenance Office, 103 Paton St., Cashmere

The District is currently near capacity with 1,479 students for the 2002-2003 school years. The district anticipates that it may need additional facilities in the future but has no current plans for expansion.

Wenatchee School District #246 Facilities:

Wenatchee Public Schools located and serving primarily outside of the Wenatchee Urban growth area include:

Sunnyslope Elementary School
3109 School St., Wenatchee
Enrollment: 284

Students living in the Sunnyslope area in grades K-6 attend Sunnyslope Elementary School of the Wenatchee School District. This facility is scheduled to be modernized during the spring and summer of 2004. When completed the capacity of the school will be at 315 students with a total of twelve classrooms. The district has acquired 4 acres east of the existing school for new facilities as needed.

No public schools are located within the Malaga-Stemilt-Squilchuck Area. The Malaga area school closed in 1969 when the Wenatchee School District extended its boundaries to include that part of the county. Students from the Malaga-Stemilt-Squilchuck Area attend Wenatchee School District facilities.

According to the 2000 Census there were 372 elementary school age children living in the Malaga/Stemilt/Squilchuck Area. High and low projections of elementary school age children have been prepared. It is projected that by the year 2012 there could be 590 (low projection) to 689 (high projection). If either of these projections is realized, it is likely that a new elementary school will be needed to serve the area.

The Wenatchee School District indicated that they use a threshold of 500 children for establishing the need for new elementary schools. As the population of the area increases it is anticipated that a new elementary school will be needed to serve the area. Currently the nearest elementary school, Mission View, is located in the south end of Wenatchee on Terminal Avenue. It is important to note that the Malaga-Stemilt-Squilchuck Area includes the Squilchuck Road corridor which, due to the restricted transportation network, would most likely remain within the

service area of Mission View School. Approximately 25 acres of land has been acquired for future expansion in the Malaga area.

Stehekin School District #69:

Stehekin Public School
Stehekin WA 98852
Enrollment: 9 Students K-8

The Stehekin School serves the area surrounding the North end of Lake Chelan. The present school was built in 1988 and can serve up to 30 students. There is no anticipated need for a new school.. Future enrollment is anticipated to remain constant, from 5 to 15 pupils.

PARKS AND RECREATION FACILITIES

The Wenatchee River County Park, located in the Monitor area, is the only County-owned park. This park includes 17 developed acres adjacent to the Wenatchee River, and includes full service camp- sites for recreational vehicles. Chelan County is well known as an area of outstanding and diverse recreational opportunities. Many of these opportunities are dispersed and occur on State and Federal lands. The County includes all or portions of the North Cascades National Park, Lake Chelan National Recreation Area, and The Glacier Peak, Henry M Jackson and Alpine Lakes and Sawtooth Wilderness Areas.

Included among the many recreation opportunities are snowboarding, cross-country and downhill skiing at Mission Ridge, Stevens Pass Nordic Center, and other ski locations, boating and water sports, golf, hiking, hunting, fishing, camping, motorized trail sports, horseback riding, sightseeing, bird watching, fossil, rock and mushroom collecting, etc.

Many regional facilities are inventoried within the incorporated Cities comprehensive plans and will not be listed in an effort to avoid duplication. Other public developed recreation sites within the County are included below.

Manson Park and Recreation District:

The Manson Park District manages 5 parks within the planning area: Manson Bay Park, Old Mill Park, Singleton Park, Willow Point Park, and Wapato Lake Campground.

The 2 acre Manson Bay Park is located in downtown Manson and consists of a lake overview, swimming area, picnic area, restrooms, 3 boat docks, and winter only boat launch. Future improvements include the 30 -slip Manson Bay Moorage, marine dump station, and parking.

The 23-acre Old Mill Park is located 2 miles east of Manson on Highway 150. The facilities at the park consist of a 4-lane boat launch, short-term moorage, a picnic area, restrooms, marine dump station, and boat trailer parking. Fifteen acres are currently developed. The Manson

Recreation District hopes to eventually provide camping facilities on the remainder of the property.

The 10-acre Singleton Park is located on the corner of Madeline and Hyacinth off of Highway 150. This park contains baseball fields and a soccer field, as well as picnic gazebo and restroom facilities. Future developments include a basketball court, and universally accessible paths and parking, and playground improvements.

The 2 acre Willow Point Park, located on Lake Chelan on Willow Point Drive in Manson, provides opportunities for swimming and day use with 3 barbecues and 5 picnic tables.

The Wapato Lake Campground is located at the East End of Wapato Lake. The campground facilities include a boat launch, 24 recreational vehicle hookups, 11 campsites, 2 boat docks, 1 gazebo and restroom facilities. Future improvements include an electric upgrade.

Manson Park Office, is located on Pedoi Street in downtown Manson. Remodels planned for 2003 and 2004 will expand the facility from 750 sq. ft. on the first level and an unimproved basement to add 595 sq. ft. on each of two levels, and add public shower facilities near the Manson Bay Moorage.

Chelan County Public Utility District:

The Chelan County Public Utility District has developed a number of parks within the County. Parks beyond the City jurisdictional planning areas include:

Chelan Falls Park is a 53-acre park constructed along the banks of the Columbia River in the small community of Chelan Falls. Facilities at the park contain a 2-lane boat launch, short-term boat moorage, parking, extensive day use facilities, picnic shelters, restrooms, showers, shoreline trail, a tennis court, playground equipment and a swimming area.

State Recreation Facilities:

Lake Chelan State Park is located at 7544 S. Lakeshore Drive. The park includes 127 acres with 6400 feet of shoreline on Lake Chelan.

Twenty Five Mile Creek State Park is located at 2530 S. Lakeshore Drive. The park includes 235 acres with 1500 feet of shoreline on Lake Chelan.

Lake Wenatchee State Park (including Nason Creek) is located at 21588 A Highway 207, Leavenworth. The park includes 488 acres with 12,623 feet of shoreline on Lake Wenatchee.

Wenatchee Confluence Park, owned by Chelan County Public Utility District #1, and operated by the State, is located at 333 Olds Station Road, Wenatchee, at the confluence of the Wenatchee and Columbia Rivers. The park is 197 acres with 8,625 feet of shoreline on the Columbia River.

Ohme Garden State Park is located at 3327 Ohme Road, Wenatchee. The park includes nine acres and is operated by Chelan County.

Squilchuck State Park is located near the junction of Squilchuck road and Wenatchee, Mountain Road south of Wenatchee. Long term plans for the park have not been determined.

Pinnacles State Park is located on Dryden Rd. 2 miles west of Cashmere. The park is 135 acres and is popular for hiking and rock climbing.

United States Forest Service Facilities:

There are a number of recreational opportunities available to residents and visitors alike on lands owned and managed by the U. S. Forest service located within Chelan County. Besides a variety of hiking, mountain biking and motorized trails there are dozens of drive to and remote campgrounds, day use and trailhead facilities. Included in the developed Forest Service Campgrounds are the following:

Antilon Lake	Grouse Mtn. Springs	Handy Springs
Junior Point	Cascade Creek	South Navarre
Windy Camp	Fields Point Landing	Fish Lake
Domke Lake	Domke Falls	Stuart
Hatchery	Moore Point	Prince Creek
Bygone Byways	Big Creek	Corral Creek
Deer Point	Fox Creek	Lake Creek
Silver Falls	North Fork	Spruce Grove
Three Creek,	Cottonwood	Pine Flat
Graham Harbor Creek	Lucerne	Mitchell Creek
Refrigerator Harbor	Safety Harbor	Eight Mile
Bridge Creek	Johnny Creek	Ida Creek
Chatter Creek	Rock Island	Black Pine Creek
Tumwater	Alder Creek	Goose Creek
Meadow Creek	Deep Creek	Deer Camp
Grouse Creek	Finner Creek	Riverbend
Chiwawa Horse Camp	Schafer Creek	Nineteen Mile
Alpine Meadows	Phelps Creek	Nason Creek
Glacier View	Soda Springs	Little Wenatchee Ford
Theseus Creek	Napeequa Crossing	Grasshopper Meadows
White River Falls	Fish Pond	Rock Creek
Atkinson Flats	Graham Harbor	Grouse Mountain
Holden	Ramona Park	Swiftwater
White Pine		

National Park Service Developed Campgrounds:

There are a number of recreational opportunities available to residents and visitors alike on lands owned and managed by the National Park Service located within Chelan County. Included in the developed National Park Service Campgrounds are the following:

Purple Point, Weaver Point, Harlequin, High Bridge, Tumwater, Dolly Varden, and Shady campground.

Although the County is rich in recreational opportunities some parts of the County have few opportunities for traditional community sports activities such as baseball, soccer, etc. Facilities for these types of activities tend to be located in more urbanized locations. Opportunities for expanding these types of facilities should be considered as sites and resources are identified.

Law Enforcement

The Chelan County Sheriff's Office provides 24-hour Law Enforcement services to the unincorporated areas of the County as well as the incorporated contract cities of Cashmere, Leavenworth, and Entiat.

The Chelan County Sheriff's Office provides for police protection to the unincorporated Chelan-Manson Area utilizing an unmanned office at the Trout Blue Chelan Building on State Rt. 150 east of Chelan.

Chelan County also provides law enforcement services to the Entiat Valley Area including the City of Entiat under contract. The City of Entiat provides a branch office for deputies to complete reports and interviews, located in the Entiat City Hall.

Chelan County also provides law enforcement services to the Lower Wenatchee River Valley Area, including the City of Cashmere under contract. Five deputies, including a sergeant, work out of the Cashmere detachment office located at the Cashmere City Hall.

Chelan County provides law enforcement services to the Upper Wenatchee River Valley Area, including the City of Leavenworth under contract. Five deputies, including a sergeant, work out of the Leavenworth detachment office located at the Leavenworth City Hall. An additional two deputies are assigned to provide law enforcement services to the Lake Wenatchee area with a detachment office established in the District 9 Fire Hall.

The Regional Law and Justice Building in Wenatchee houses the headquarters of the Sheriff's Office, the 911 emergency dispatch center, the Regional Jail, and the County Prosecuting Attorney's Office, and Superior Court offices. The facility opened in 1984. Principal partners in the Regional Jail are Chelan County, Douglas County and the City of Wenatchee. Expansion of the existing adult detention facility was completed in 2000, which increased the capacity to 269 beds. The facility is considered to be chronically overcrowded. Plans are being prepared to expand the facility to adjacent County-owned buildings to provide a 400-bed facility, which is projected to be sufficient for the planning horizon.

In 1998 the County completed a new 50-bed juvenile detention facility located at 300 Washington Street, Wenatchee.

Fire protection

CHELAN-MANSON AREA

Two Chelan County fire districts provide fire protection for the Chelan Area and one fire district provides protection of the Entiat Area. Fire District 5, which covers the Manson area, has their main station located in Manson. Fire District 7 provides fire protection for the City of Chelan and the unincorporated areas around the City including Chelan Falls. District 7 stations are located in Chelan, in Chelan Falls, at the Chelan Airport and at Kelly's Resort.

Chelan County Fire District #7:

a. Station #1 Location: 232 E Wapato Way, Chelan

Equipment: 2 Fire Engine/Pumpers; 1 Rescue/Medical Assist; 1 Water Tender/Tanker; 1 Brush Truck, 1 Ladder Truck

Number of Personnel: 1 full-time, 2 seasonal, 40 Volunteer (personnel for all 4 stations in District)

b. Station #2 Location: Chelan Falls

Equipment: 1 Fire Engine/Pumper, 1 Water Tender/Tanker, and 1 Brush Truck

c. Station #3 Location: Kelly's Resort (South Shore of Lake Chelan)

Equipment: 1 Fire Engine/Pumper, 1 Water Tender/Tanker, and 1 Brush Truck

d. Station #4 Location: 565 Apple Acres Road. Chelan Airport

Equipment: 1 Fire Engine/Pumper, 1 Brush Truck

There are no planned Critical improvements or expansions for Fire District #7.

Chelan County Fire District #5:

a. Station Location: 250 W. Manson Blvd. Way, Manson

Equipment: 2 Fire Engines/Pumpers; 1 Brush Truck, 1 Ambulance/Aid car

Number of Personnel: 27 volunteers

b. Station Location: 2010 Wapato Lake Road. Manson

Equipment: 1 Pumper, 1 Tender/Tanker, and 2 Brush Trucks

There are no planned Critical improvements or expansions for Fire District #5.

ENTIAT VALLEY AREA

Chelan County Fire District #8 provides fire protection for the area. Five stations serve the City of Entiat, the Entiat River Valley and property north and south of the City of Entiat adjacent to the Columbia River, from Tenas George Canyon to Staymen Flats. The residents of Navarre Coulee are also served by Fire District #8.

Chelan County Fire District #8:

- a. Station #1 Location: 4674 Entiat River Road, Entiat
Equipment: 2 Water Tender/Tankers, 1 Fire Engine/Brush Truck
Number of Personnel: 40 Volunteer (for the entire district)
- b. Station #2 Location: Entiat River Road. and Entiat Way
Equipment: 1 Fire Engine/Brush Truck, 2 Ambulances
- c. Station #3 Location: City Of Entiat Station in conjunction with City Hall
Equipment: 1 Pumper Truck, 1 Brush Truck
- d. Station #4 Location: Ardenvoir
Equipment: 1 Fire Engine, 1 Brush Truck, and 1 Water Tender
- e. Station #5 Location: 20 Miles up the Entiat River Road from Hwy. 97, in the Riverwood Subdivision.
Equipment:
- f. Future Station Location: Stayman Flats

No additional improvements are currently planned by Fire District 8.

MALAGA-STEMILT-SQUILCHUCK AREA

Chelan County Fire District #1 provides fire protection to approximately one-third of the area. The rest of the area is not within a public fire district boundary. On federal lands outside of the district boundary fire protection services are coordinated between the District and the U.S. Forest Service pursuant to an Emergency Fire Suppression Agreement.

Chelan County Fire District #1:

- a. Station #4 Location: 4852 Squilchuck Road, 1836 S. Mission, Wenatchee
- b. Station #5 Location: 320 Bohart Road, Wenatchee
- c. Station #7 Location: 3760 West Malaga Road, Wenatchee.
Station #7 is a training center that has been designed as a multi-purpose facility, which will be available as a public meeting place. Also, the heliport here will replace the existing facility at the District's Easy Street headquarters.

Being a rural area the area has some unique fire protection needs. Most of the area is not served with public water. During the summer months the threat of fire in the outlying areas usually results in road closures which restrict access and activities in certain areas. The roads and areas most often affected include: Pitcher Canyon Road, Forest Ridge Road, Wenatchee Heights Road, Stemilt Loop Road, Dago Grade and Halvorson Loop Road.

The Citizen Advisory Committee identified the Stemilt Hill area as an area of specific concern due to the lack of fire stations located in that area.

LOWER WENATCHEE RIVER VALLEY AREA

Chelan County Fire Districts #1, #6 and #8 and the Cashmere Fire Department provide fire protection for the area.

Chelan County Fire District #1:

Chelan County Fire District #1, which covers Sunnyslope and unincorporated areas west and south of Wenatchee, has their main station located on Easy Street in the Sunnyslope area.

Station Location: 206 Easy Street (Sunnyslope)

Equipment: 1 Fire Engine/Pumper; 1 Aerial/Ladder Truck; 1 Water Tender/Tanker, 2 Brush Trucks

Number of Personnel: 17 paid, 35 Volunteer (personnel for all 9 stations in District)

The District believes an additional fire station will not be needed in the Sunnyslope area over the next 20 years.

Chelan County Fire District #6:

Fire District #6 provides fire protection for Monitor north to Peshastin and has a station in Monitor, and shares space at the City of Cashmere station.

Station Location: Main Street, Monitor

Equipment: 1 Pumper, 1 Brush Truck

Station Location: City of Cashmere

Equipment: 1 Water tender, 1 Brush Truck, 1 Pumper

No planned improvements by Fire District 6 are known.

Cashmere Fire Department:

Station Location: 200 Cottage Avenue, Cashmere

Equipment: 2 Fire Engines/Pumpers; 2 Brush Trucks; 1 Water Tender/Tanker; 1 Aerial/ladder Truck; 1 Ambulance/Aid Car, 1 Command Vehicle, 1 Utility Truck

Number of Personnel: 25 Volunteer

UPPER WENATCHEE RIVER VALLEY AREA

Chelan County Fire Districts #3 and #6 provide fire protection for the area.

Chelan County Fire District #3:

Main Station Location: 228 Chumstick Rd., Leavenworth

Equipment: 1 1500 GPM/750 Gallon and 1 1250 GPM Fire Engine Pumper, 80" Platform Truck, 1 500 GPM/2000 Gallon Tanker, 1 4x4 Crewcab Wildland/Rescue, 1 4x4 wildland, 1 4x4 Crewcab Command Pickup, 1 Utility Truck/Wildland.

Mile 7.5 Chumstick Rd.

Equipment: 1 1250 GPM/750 Pumper, 1 250 GPM/2500 Gallon Tanker

Number of Personnel: three (3) Career and twenty five (25) Volunteer personnel.

Fire District 3 provides fire protection for the Icicle and Chumstick Valleys, the City of Leavenworth and surrounding area.

Chelan County Fire District #6:

Station Location: Main Street Peshastin.

Equipment: 2 Pumpers, 1 Brush Truck

Personnel: 17 volunteers.

Station Location: 6817 Dryden Avenue, Dryden.

Equipment: 2 Pumpers, 1 Brush Truck

Personnel: 23 volunteers

Station Location: Blewett Pass

Equipment: 1 Brush Truck, 1 Pumper

Personnel: 14 volunteers.

Future Needs: None identified by the Fire District.

Fire District #6 provides fire protection for the Peshastin, Dryden and Blewett Pass areas. Outside of the fire district boundaries, fire protection services are coordinated between the districts and the U.S. Forest Service pursuant to an Emergency Fire Suppression Agreement. The Chelan County Department of Emergency Management (DEM) acts as coordinating agency for that agreement. The DEM is currently working on an interlocal agreement to include the State Department of Natural Resources in the Emergency Fire Suppression Agreement process.

PLAIN/LK. WENATCHEE AREA

Chelan County Fire District #4:

Fire District #4 has a service area that which includes the Ponderosa Subdivision and the southeast portion of Wenatchee Park #1. The District is 23 years old and one of the smallest fire districts in the state. District #4 also provides emergency medical service to Ponderosa and outlying areas. Equipment: The District has one station and 4 fire vehicles. The District participates in statewide mobilization efforts.

Chelan County Fire District #9:

Fire District #9 serves most all of the rest of the populated areas in the Area, including Plain, Lake Wenatchee and the US Hwy 2 corridor from Chiwaukum to Cascade Meadows Church Camp up to White Pine Creek.

Station Locations: Station #1 located at 216 Lake Wenatchee Hwy.; 1 Engine/Pumper, 1 Brush Truck, 1 Water Tender, 1 Rescue/Air Vehicle. Station #2 located at Chiwawa Pines; 1 Engine/Pumper, 1 Brush Truck. Station #3 located at Plain; 1 Engine/Pumper, 1 Water Tender, 1 Brush Truck. Station #4/Shop located at Plain; 1 Water Tender 1 Command Vehicle.

Twenty-two volunteers staff all stations.

STEHEKIN AREA

The National Park Service provides wildland and structure fire protection for federal lands and federally owned structures in Stehekin. Through a memorandum of agreement the Park Service provides initial attack response for wildland fire on non-federal land. The Park Service is not equipped or staffed to provide fire protection services for privately owned structures in Stehekin. In 2006, Fire District #10 was formed by a public vote of the citizens of Stehekin and outlying areas. Fire District #10 coordinates closely with federal land managers and provides fire protection and prevention services for privately owned structures. Resources are currently limited.

CHELAN COUNTY PROPERTIES

Sunnyslope Shop, 210 Easy Street, Wenatchee, 8.77 acres

Equipment Maintenance Shop

Wenatchee Road Crew Shop

Sign Crew Shop

Sander Storage Shed

Emergency Services Buildings

Fuel Storage

Materials Stockpile

Cashmere Shop, 5815 Wescott Drive, Cashmere, 4.36 acres

Cashmere District Shop

Sander Storage Shed

Materials Stockpile

Fuel Storage

Metal Building

Leavenworth Shop, 10210 County Shop Road, Leavenworth, 6.87 acres

Leavenworth District Shop

Sander Storage Shed

Materials Stockpile

Fuel Storage

Ardenvoir Shop, 9486 Entiat River Road, Entiat, 1.7 acres

Special Permit from Forest Service

Entiat District Shop

Materials Stockpile

Fuel Storage

Chelan Shop, 23290 Highway 97A, Chelan, 5.0 acres

Chelan District Shop

Sander Storage Shed

Materials Stockpile

Fuel Storage

Squilchuck Sand Storage

Metal Building

Materials Stockpile

Transfer Stations:

Dryden, 18.53 acres

Chelan, 1.79 acre

Miscellaneous:

Sludge Site, Leased to City of Wenatchee, 43.93 acres

Manson Landfill (Closed), 12.52 acres

Pit Sites

Shaw Pit K-116, Stemilt Hill Road,
2.4 acres

Shugart Flats Gravel
12.25 acres

Colockum Pit
2.02 acres

Boyd Road
5.12 acres

Malaga Pit K-129
7.58 acres, Metal Building, Materials Stockpile

Arne Sorlie Property,
120' x 500'

West Malaga Pit K-104
26.12 acres, Materials Stockpile

Lepley Pit - Chapman Road
.8 acres

Icicle Road and SR 2 Pit K—36
3.24 acres

Washington Creek
1.9 acres

Leavenworth Day Pit K-155,
13 acres

State Pit PS K 190
Lot 2, Block 2, River Glen Orchards

Stanley Borrow and Gravel
1.63 acres, Materials Stockpile

Property next to Leavenworth shop

County Buildings

Annex Building, 411 & 415 Washington Street, Wenatchee, 17,250 sq. ft.

Auditorium, 400 Douglas Street, Wenatchee, 10, 000 sq. ft.

Chaplain's Building, 428 A. Orondo Avenue, Wenatchee, 1,500 sq. ft.

Courthouse, 350 Orondo Avenue, Wenatchee, 41,000 sq. ft.

Detoxification Center, 327 Okanogan Street, Wenatchee, 11,934 sq. ft.

East Annex, 311 & 315 Palouse, Wenatchee, 2,800 sq. ft.

Juvenile Administration, 316 Washington Street, Wenatchee, 18,000 sq. ft.

Juvenile Detention, 300 Washington Street, Wenatchee, 39,000 sq. ft., 50 bed facility.

Law & Justice Building, 401 Washington, Wenatchee, 98,560 sq. ft.
The Law & Justice Building includes the 197 bed regional jail facility.

Maintenance Garage, 428 B Orondo Avenue, Wenatchee, 16,000 sq. ft.

Improvements to these facilities, that have been identified as needed to maintain and improve the services supported by these facilities, are itemized in the Critical Financing Plan included in this Element.

SERVICES

Telecommunication Services

Television Service

Cable television is provided in various locations throughout the County by various service providers.

In the Chelan – Manson Area, there are currently three cable television purveyors, Millennium Cable, Sun Cable, and T.V. Improvement District #1. These purveyors provide service to portions of the area. Cable television is available in the City of Chelan, North and South Shore of Lake Chelan, Community of Manson, and Chelan Falls.

In the Entiat Valley Area, service is available in the City of Entiat and surrounding area through Millennium Cable, and in Navarre Coulee through Sun Cable. In the remainder of the Area, cable television service is not available.

Television service in the Malaga-Stemilt-Squilchuck Area is provided by Falcon Cable and Sun County Cable. Falcon Cable is available in the Squilchuck corridor up to the Wenatchee Heights turn-off only. They have indicated that they may extend service into Wenatchee Heights, and farther up Squilchuck Road to the Forest Ridge Development. Sun County Cable provides service in the Malaga area. At this time they have no plans to increase their service in this area.

In the Lower and Upper Wenatchee River Valley Areas cable television service is provided by Falcon Cable. Cable is available in many areas from the Sunnyslope area to the Icicle Canyon area near Leavenworth. Service is also provided to portions of Fairview and Hay Canyons and the Blewett Pass area.

There is no cable television service to the Plain/Lake Wenatchee area. Provisions of service to the area has been explored by at least one purveyor.

In the Stehekin Valley, no cable service presently exists or is contemplated in the planning horizon. In the areas not presently served by a cable television provider, small dish satellite technology is utilized for television service.

Telephone/Cellular Phone

Local telephone service has been provided to the County by GTE Northwest since 1952. There are various facilities located throughout the County and the cities within Chelan County. According to GTE, the delivery of telecommunication services sometimes does not coincide with the exact location of customers. Many of the telecommunication facilities, including overhead and underground delivery lines, are co-located with those of the electrical power

provider. In the Stehekin Area, the National Park Service provides a satellite operated, coinless public telephone at the Stehekin Landing.

Cellular telephone service has been provided in Chelan County since 1991. Both Air Touch Cellular and Cellular One provide this service in the County. Facilities related to cellular telephone service include low-powered transmitting antennas and a central computer called a telephone switching office. The mobile nature of the service requires the installation of transmitting antennas strategically placed to transmit the signal from the mobile unit to the switching center.

Air Touch Cellular presently has cellular towers sited in the following locations in Chelan County:

Wenatchee Heights

1. Stevens Pass – summit
2. Round Mountain – 11 miles east of Stevens Pass summit
3. Natapoc – Lake Wenatchee
4. Boundary Butte – Leavenworth
5. Diamond Head – Blewett Pass
6. Blewett Pass – summit
7. Cashmere – Stine Hill Rd.
8. Laurel – Wenatchee Valley
9. Chelan Butte

Cellular One also has two cellular tower sites on Badger Mountain located in Douglas County serving the Wenatchee Valley. Cellular One is anticipating additional sites in the following areas: Entiat, Monitor and within the City of Wenatchee. With the movement to digital technology from analog technology, cellular tower siting is required to be located at lower elevation levels.

The telecommunications industry will continue to have tremendous advances in technology. Both cellular and optical fiber technologies are transforming service delivery in Chelan County. As the County grows and technological advances are made, telecommunication facilities will be upgraded to ensure adequate service levels.

Natural Gas

Cascade Natural Gas currently provides service to approximately 2000 residential customers in Chelan County. The major transmission line of the Northwest Pipeline Corporation natural gas utility comes from the southeastern portion of the County near Alcoa. The line generally follows the alignment of the Colockum Road/Malaga-Alcoa Highway.

In the Malaga-Stemilt-Squilchuck Area natural gas is currently available along the transmission line that runs near the Malaga-Alcoa Highway and within the old town-site of Malaga. No homes in the old town-site are connected to the line, although; along the highway several homes are connected to the line. Fire District #1 also has natural gas extended to their fire station on West Malaga Road.

Cascade Natural Gas also provides service to the Sunnyslope/Olds Station area with a 6 inch line that crosses the Wenatchee River at the railroad bridge. A line located along Easy Street

serves residential customers in the Sunnyslope area. The system was updated in 1997 and a new line installed providing service up to the Tree Top plant located on Highway 97A. Future plans include extension of this line to eventually serve the Chelan and Entiat Area.

Extension of service into new areas is on a demand basis. Cascade Natural Gas will provide the extension of the service and will enter into an agreement with the requesting party for reimbursement of the improvement. As additional customers connect to the extended line the initiating party is reimbursed. Expansion of the natural gas system i.e., the location, capacity, and timing, will depend greatly on opportunities for expansion and on how quickly the County grows. In addition, any route taken to provide service will depend on right-of way permitting, environmental impact, and the opportunities to install gas mains with new development, highway improvements or other utilities.

Liquid Petroleum Gas is provided to a number of customers in the County by three different suppliers: Empire Gas, Amerigas and Wenatchee Petroleum. Growth of this fuel as an alternative to electricity will depend on the ability of the PUD to provide low cost electrical service to the County.

Electrical Utilities

All public electric power in the County is provided by the Chelan County Public Utility District #1 (PUD), a special purpose public agency. The District is governed by an elected board of commissioners. The District is a publicly owned municipal corporation of the State of Washington. The PUD, as a public utility, is required to provide service to everyone in its service area. As of June 1999, the number of active meters is 37,614 and this number is expected to reach approximately 67,000 in a 20 year time period. The PUD is authorized to provide electric service to their owners at cost and without profit. According to the PUD, there currently is capacity to meet existing demand for both the incorporated areas of the County as well as the rural areas.

In 1998, the District hired the firm, Electrical Consultants, Inc. to conduct a long-range transmission planning study. The scope of the study included system planning and major station facilities. The study looked at contractual agreements and obligations, load forecasts and basic planning and design criteria. Some of the anticipated problems the study identified are low transmission system voltages in the Stevens Pass area, Chelan Union Valley area, and Sunnyslope area under certain operating conditions in the future. In addition, it is anticipated that several transformers and line sections will be overloaded with a projected annual load growth rate of 3.9%. This plan and subsequent updates are hereby adopted by reference.

The District's goal is to provide uninterrupted electrical service within their service area. To satisfy this goal, the PUD has in place electrical sub-stations at the following locations:

1. Wapato
2. Manson
3. Union Valley
4. Chelan
5. Chelan Falls Switchyard
6. Winesap
7. Entiat
8. Entiat Valley
9. Rocky Reach Switchyard

10. Rocky Reach
11. Malaga
12. Kaweck (Malaga area)
13. Valhalla McKenzie (Malaga area)
14. Alcoa
15. Squilchuck
16. Olds Station
17. Sunnyslope
18. Mission (Cashmere area)
19. Sunset (Cashmere area)
20. Peshastin/Dryden
21. Anderson Canyon Switchyard (Peshastin)
22. Leavenworth
23. Plain
24. Lake Wenatchee
25. Winton Mill
26. Coles Corner
27. Berne (Stevens Pass)
28. Summit (Stevens Pass Summit)

As of August 1999, the following Critical improvement projects are tentatively in the District's 20 year Long Range Plan:

1. Lake Crossing Substation – located in Manson to meet the projected load growth demand. (Tentative completion date 2012)
2. Boyd Switching Station – Located in the Chelan Boyd District area to meet the projected load growth demand and also to mitigate the projected low transmission system voltage. (Tentative construction date 2008)
3. South Shore Substation – Located on the Chelan Highway, near the Hawk's Meadow area to meet the projected load growth demand and minimize the projected low distribution system voltage. (To be completed in 2007)
4. South Wenatchee Substation – Located along Crawford St. to meet projected load growth demand. (To be completed as needed)
5. Castlerock Substation – Located at the western end of Castlerock St. in Wenatchee to meet the projected load growth demand. (To be completed in 2007)
6. Monitor Switching Station – Located on Easy Street, approximately ½ mile east of Boswell's Furniture to meet the projected 10% load growth demand in the Sunnyslope area and also to mitigate the projected low transmission system voltage. (To be completed in 2003)
7. Old Mill Substation – Located at the old Peshastin Mill site to meet the projected load growth demand. (To be completed as needed)
8. Transmission Line Construction Projects – Short transmission lines to be built to serve all future substations mentioned above.

These substations and switching stations will be built on existing PUD property or property acquired by leasing or purchase. The Critical cost and maintenance expense of establishing new substations will be borne by the PUD.

The Stehekin Area has a hydroelectric plant which is augmented by three diesel generators. The electric plant is located on Company Creek and only supplies the Stehekin Valley.

Normal base load is carried by the 200 kw hydro plant. When peak loads exceed the capacity of the hydro unit, an auto start relay starts a diesel driven 75 kw induction generator. The system is not on the Northwest Power Grid; it is a totally independent system.

The Stehekin power system has two synchronous diesel generators in addition to the one induction unit. There is a total capacity of 775kw with the hydroelectric and generators combined. In the winter when temperatures drop toward zero, the stream flow in Company Creek also drops and the hydro intake begins to ice up. When this condition occurs, the output of the hydro declines and is eventually taken out of service. This condition usually occurs every winter, with the duration of the outages varying. The National Park Service maintains an emergency backup system for federally owned facilities at Stehekin Landing.

STREETS AND ROADWAYS

Streets and roadways are provided in Chelan County by the Washington State Department of Transportation, Chelan County, and the Cities of Cashmere, Chelan, Entiat, Leavenworth, and Wenatchee. (Cashmere and Wenatchee are not included in this plan.) Public roadways in the Stehekin area are provided and maintained by the National Park Service. The National Forest Service maintains roads on and near National Forest lands.

WSDOT is responsible for six highways within Chelan County. These are US-2, US-97, SR-207, SR-150, SR-971 and SR 285. US-2 and US-97 are the major routes within the county. US-2 runs east/west passing through the cities of Coles Corner, Leavenworth, and Cashmere to Wenatchee. US-97 runs north/south on Interstate 90 from Ellensburg, connecting with US-2 (running east/west), then splitting into Alternative 97 (US-97A) and continuing north/south along the west side of the Columbia River, through the City of Chelan, where it reverts back to US-97. US-97A serves the cities of Wenatchee, Entiat and Chelan. US-97 links the County with Canada to the north and Ellensburg and Interstate 90 to the south. The state routes within the county (SR-207, SR-150, and SR-971) all run short distances, connecting smaller towns with either US-2 or US-97. Within the Wenatchee Urban Area SR 285 is coincident with County and City Roads traveling through Wenatchee.(see WATS). WSDOT is responsible for the south end bridge crossing between Wenatchee and East Wenatchee.

Chelan County owns and operates 755 miles of roadway in the County, as well as 46 bridges, and some bicycle and pedestrian facilities. Unless noted, information in this section refers to the County road system and its components.

BRIDGE FACILITIES

There are 44 bridges on County roadways that are listed on the National Bridge Inventory System (NBIS), and 30 bridges on State highways operated and maintained by WSDOT. There are also several bridges that are on city inventories and some bridges less than twenty feet long

(not on NBIS). Table 1 and Table 2 list both County and WSDOT bridges by area. The National Park service maintains six bridges in the lower Stehekin Valley.

County bridges are generally in good condition, however several bridges have rated capacity below the current HS-20 rating. Three bridges are load restricted including Old Griffith - 10 ton, Peshastin Creek Saunders - 15 ton, and West Monitor - 4 ton.

TABLE COUNTY BRIDGE INVENTORY				1:
BRIDGE NAME	BRIDGE	CROSSING	ROAD NAME	MILE POST
1 Ardenvoir	505A	Entiat River	Mad River Road	0.050
2 Beecher Hill	923	Irrigation Canal	Beecher Hill Road	0.710
3 Cascade Orchards	413	Wenatchee River	Cascade Orchard Rd	0.830
4 Chelan Falls 2nd	805A	Chelan River	Chelan Falls Road	0.200
5 Chiwawa River	703A	Chiwawa River	Chiwawa Loop Road	3.920
6 Chumstick Creek #1	2094.25	Chumstick Creek	Chumstick Highway	3.770
7 Chumstick Creek #2	2095	Chumstick Creek	Chumstick Highway	4.170
8 Chumstick Creek #3	2095.25	Chumstick Creek	Chumstick Highway	4.710
9 Chumstick Creek #4	2096.25	Chumstick Creek	Chumstick Highway	6.590
10 Chumstick Creek #5	2096.75	Chumstick Creek	Chumstick Highway	7.380
11 Chumstick Creek #6	2098.25	Chumstick Creek	Chumstick Highway	8.730
12 Colockum Dillville	910	Colockum Creek	Tarpiscan Road	0.270
13 Cowan-Entiat River	502	Entiat River	Entiat River Road	2.760
14 Crestview	922	Irrigation Canal	Crestview Street	0.200
15 Dryden	406A	Wenatchee River	Dryden Main Street	3.940
16 East Leavenworth	414	Icicle Creek	East Leavenworth Rd	2.790
17 Hay Canyon	911	Irrigation Canal	Hay Canyon Road	0.390
18 Highline-Dryden Main	404	Irrigation Canal	Dryden Main Street	0.070
19 Highline-Dryden School	405	Irrigation Canal	Dryden School Road	3.560
20 Highline-Fifth Ave	403	Irrigation Canal	North Dryden Road	0.200
21 Merritt	605A	Nason Creek	Gill Creek Road	0.090
22 Mission Creek #2	312A	Mission Creek	Mission Creek Road	0.090
23 Mission Creek #3	313A	Mission Creek	Mission Creek Road	1.520
24 Mission Creek #4	314A	Mission Creek	Mission Creek Road	1.730
25 Mission Creek #5	317A	Mission Creek	Mission Creek Road	0.200
26 Mission Creek/Sunset	314	Mission Creek	Sunset Highway	0.280
27 Moe Ridge	506	Mad River	Moe Ridge Road	0.080
28 Monitor	305	Wenatchee River	Monitor Main Street	1.560
29 Nason Creek (Lake Wenatchee)	704A	Nason Creek	Cedar Brae Road	0.150
30 New Griffith	503B	Entiat River	Entiat River Road	3.950
31 Old Griffith	503	Entiat River	Entiat River Road	0.240
32 Peshastin	411A	Wenatchee River	Peshastin Main St	4.390
33 Peshastin Cr./Green Bridge	409A	Peshastin Creek	Green Bridge Road	0.070
34 Peshastin Creek	410B	Peshastin Creek	Log Bridge Road	0.020
35 Peshastin Creek/Ingalls	321	Peshastin Creek	Ingalls Creek Road	0.030
36 Peshastin Creek/Saunders	408	Peshastin Creek	Saunders	0.280
37 Roaring Creek New	504A	Entiat River	Roaring Creek Road	0.100
38 Sleepy Hollow	303A	Wenatchee River	Sleepy Hollow Road	0.140
39 Stemilt Creek	201	Stemilt Creek	Malaga Alcoa Hwy	3.710
40 Stone Hill	915	Colockum Creek	Colockum Road	7.410
41 Wenatchee River	20912	Wenatchee River	Beaver Valley Road	14.410
42 West Cashmere (Goodwin)	401	Wenatchee River	Goodwin Road	0.160
43 West Monitor	306	Wenatchee River	Old Monitor Road	0.170

TABLE WSDOT BRIDGE INVENTORY				2:
BRIDGE NUMBER	BRIDGE / LOCATION	CROSSING	MILEPOST	
2/203	6.8 E. King Co.	BN RR Undercrossing	71.79	
2/204	7.7 E. King Co.	Nason Cr	72.65	
2/207	16.3 E. King Co.	Nason Cr	81.36	
2/210	1.7 E Jct SR-207	BN RR Undercrossing	86.99	
2/212	4.7 E Jct SR-207	Chiwaukum Cr.	98.88	
2/215	5.5 E Jct SR-207	Wenatchee R.	90.57	
2/217	8.2 E Jct SR-207	Drury Canyon	93.35	
2/219	0.2 E Jct SR-209	Wenatchee R. Bridge	100.44	
2/220	16.4 E Jct SR-209	Icicle Ditch Spillway	101.04	
2/224S	0.1 E Jct SR-97	Peshastin Cr	104.78	
2/224N	0.1 E Jct SR-97	Peshastin Cr	104.78	
2/226S	1.1 E Jct SR-97	Wenatchee River	105.78	
2/226N	1.1 E Jct SR-97	Wenatchee River	105.78	
2/227S	1.5 E Jct SR-97	Wenatchee River	106.17	
2/227N	1.5 E Jct SR-97	Wenatchee River	106.17	
2/228S	2.4 E Jct SR-97	Wenatchee River	107.03	
2/228N	2.4 E Jct SR-97	Wenatchee River	107.03	
2/229	2.6 E Jct SR-97	BN RR Undercrossing	107.33	
2/236	10.5 E Jct SR-97	Pedestrian Undercrossing Monitor	115.18	
2/238	14.2 E Jct SR-97	SR-2 Overcrossing	118.87	
2/260S	14.9 E Jct SR-97	Euclid Ave OvercrossingC SR-97 Int	119.66	
2/260N	14.9 E Jct SR-97	Euclid Ave OvercrossingC SR-97 Int	119.66	
2/270	0.2 E Jct SR-97Alt	BN RR Overcrossing	119.69	
972/275	0.3 E Jct SR-97Alt	Columbia R @ Olds	119.78	
97/364 ALT	34.1 N Jct SR-2	Chelan R-Dan Gordon Br	233.96	
97/403	0.5 N Jct SR-2	Pine Canyon Creek	213.53	
97/406	4.3 N Jct SR-2	Dry Gulch	217.31	
97/408	6.2 N Jct SR-2	Dry Gulch	219.28	
97/420	21.8 N Jct SR-2	Columbia R Beebe	235.06	
97/391	25.6 N Jct SR-2	BNRR Overcrossing	238.87	

Source: NBNS/Chelan County 1996 Bridge Inventory and WSDOT 1995 Bridge List

PUBLIC/QUASI PUBLIC TRANSPORTATION

Aviation Facilities and Services

Aviation facilities in Chelan County consist of four airports of various size serving general aviation users. General aviation consists of all civil aviation activity except that of certified air carriers. Approximately 185 private-use general aviation aircraft are registered in Chelan County⁹. No passenger service is currently provided at a facility in Chelan County. The closest air carrier airport is Pangborn Memorial Field in East Wenatchee. Pangborn Field, at the time of this report, was served by Horizon Airlines and United Express, with approximately nine flights

per day to Seattle-Tacoma International Airport and two flights per day to Portland International Airport.

Pangborn Memorial Airport Master Plan Update 1993-2013 was prepared by the Airport Board as part of an ongoing program of providing and supporting the transportation needs of the Wenatchee area as well as Chelan, Douglas, and Okanogan Counties. Short-, intermediate-, and long-range needs for facilities at Pangborn Memorial Airport are addressed in the plan.

The 125 airplanes expected to be based at the airport in the year 2013 represent a 25 percent increase over the 100 based there in 1993. Along with increases in the number of based aircraft, general aviation aircraft operations are forecast to increase about 73 percent, from 52,500 annual take-offs and landings in 1992 to 91,000 operations by the year 2013. The composition of the fleet that is flying these operations is expected to continue to reflect national general aviation trends. Consequently, future general aviation operations will continue to be dominated by business oriented flight, private transportation, flight training, or other forms of non-commercial activity using single and multi-engine piston aircraft.

Turboprop Dash 8 aircraft provides commercial passenger service. Horizon Airlines is the single scheduled airline serving the airport. Commercial operations are forecast to increase by about 3 percent while passenger enplanements are expected to grow by about 135 percent. The comparatively small increase in commercial operations is due to the expected increased use of aircraft with higher seating capacities.

Aviation service within the northern part of the County is provided out of the City of Chelan (Chelan Municipal Airport) by Chelan Airways. Chelan Airways is located at 1328 West Wooden Avenue in the City of Chelan. Chelan Airways fly two floatplanes in and out of Stehekin and Domke Lake on a pre-arranged basis when weather conditions permit. Scenic tours over Lake Chelan and the Stehekin Valley are also available out of the Chelan Municipal Airport. Aviation service is available seven days a week but hours vary because they fly on demand. During the summer months, service averages six to eight flights per day, however; during the winter, several weeks can go by without a flight (Personal Communication, I. Eischens, December 10, 1996).

Chelan Municipal Airport is owned and operated by the City of Chelan. The airport is located in the Howard Flats area 3 miles northeast of Chelan. It is classified as a general aviation uncontrolled airport. The airport is staffed with one full-time maintenance worker and one part-time assistant who allows the airport to be manned 24 hours a day. There is one 40x50 foot building that serves as a pilots lounge, and a mobile home that houses a full-time staff person. The airport runway is 3,570 feet long, paved, and has Medium Intensity Runway Lighting (MIRL). In 1996, the City of Chelan applied for a grant from the State of Washington to build a taxi lane for the runway. This was received and work was completed in 1997.

The Stehekin Airfield is a seasonally operated facility with a 2,700-foot long runway. The airstrip is located on federal land and is operated by the Washington State Department of Transportation under the terms and conditions of a Special Use Permit issued by the National Park Service. This permit specifically prohibits commercial operation. The airfield is used as a

staging area for helicopter operations during some fire and emergency responses. The 1995 General Management Plan for the Lake Chelan National Recreation Area provides for continued operation of the airstrip only as long as the State Department of Transportation agrees to operate the facility subject to the terms and conditions of a Special Use Permit.

There is one airfield in the central part of the County. Lake Wenatchee State Airport is located 16 miles northwest of the City of Leavenworth (north of SR-207 and northeast of Lake Wenatchee). This is a state-owned, unlit, unpaved airfield with a runway length of 2,400 feet. The airfield is closed from October 1 through June 1. Lake Wenatchee is commonly used to land float planes; however there are no established aviation facilities or services.

The Cashmere-Dryden Airport, located 1.1 miles southwest of Cashmere, is a County-owned airport with a 1,800 foot asphalt runway and a Non-Standard Lighting System. Services at this facility are provided on an on-call basis.

Rail Facilities and Services

Passenger rail service to Chelan County is provided by AMTRAK. Trains make one stop within the County at the AMTRAK station in downtown Wenatchee. The eastbound train (Empire Builder) travels to Chicago via Spokane, Montana and St. Paul, Minnesota. This train operates daily, leaving at 8:51 pm. The westbound train travels to Seattle, leaving at 5:16 a.m. daily. Other locations are served by changing trains in Seattle or Chicago.

Rail freight facilities in the County consist of a Burlington Northern-Santa Fe (BNSF) branch line that runs between Spokane and Everett through Chelan County. Approximately 22 trains/day utilize the rail, carrying freight. These trains are usually approximately 1-mile long or about 60 railroad cars. Freight loaded in Chelan County includes, lumber, wood chips, aluminum, apples, pears, etc.

In addition to the BNSF line, The Columbia River Railroad Company (a subsidiary of Rail America Inc.) operates the stretch of rail from Wenatchee to Entiat, Chelan, and north to Oroville, near the Canadian border in Okanogan County. One train operates between Wenatchee and Okanogan. Sidings, or industry tracks, are provided to regular users in a number of locations. Service varies with demand, from one round trip/day (Monday-Saturday) to as little as three round trips/week. The Okanogan branch line connects with a BNSF main line in Wenatchee for access to Spokane to the east and Everett to the west.

The Chelan County BNSF railroad branch line is reported in good condition. The main line through Wenatchee is considered a high capacity multimodal line with high priority for service. No change in facilities or service is anticipated in the short term.

Transit Service and Routes

The Chelan County Public Benefit Transportation Area (PTBA) known as Link provides transit service in Chelan County. The *Link* system began operating in 1991 after the formation of the Chelan-Douglas Public Transportation Benefit Area. *Link* currently offers fixed route and route-deviated bus service, and provides para-transit services for elderly and disabled users. The system's service district includes all of Chelan County and parts of Douglas County.

The level of service provided by *Link* is outlined in the current published Service Plan. It is funded through a 0.4% County sales tax, Motor Vehicle Excise Tax funds and a fair system that was established in the year 2000. *Link*'s fixed transit routes in Chelan County begin and end at the Wenatchee Transfer Center in downtown Wenatchee.

SCHOOL BUS SERVICES AND ROUTES

Seven school districts operate between 9 and 20 bus routes per district within Chelan County. These school districts are:

- Chelan School District (#129)
- Cascade (Leavenworth) School District (#228)
- Cashmere District (#222)
- Entiat School District (#127)
- Manson School District (#19)
- North Central (Wenatchee) District (#171)
- Wenatchee District (#246)

Most County roads are used for school bus routes, however all routes are subject to change as school populations change. Roadway maintenance needs, such as snow removal, on bus routes receive higher priority from County staff on a normal basis.

United States Forest Service (USFS) Roadways

The Wenatchee National Forest (largely located in Chelan County with a portion located in Kittitas County) operates and maintains approximately 5,000 miles of roadway and about 2,500 miles of trail. Cars, trucks, motorcycles, horses, bicycles, wheelchairs, pedestrians and other modes of transportation traverse these roads and trails for recreation, resource management projects and private property use. Historically, much of the road system on the Wenatchee National Forest was developed to gain access to timberlands. These access points have been maintained largely at the expense of the United States Forest Service.

The United States Forest Service operating budgets and ability to maintain all of the existing road system have been reduced. Therefore, some roads may be removed from the system, others

closed until future access is needed, and many others kept at the lowest possible maintenance levels for budget and resource protection reasons.

Water Transportation

Commercial water transportation in the northern part of the County includes the passenger ferryboats, commercial barges, and a small commercial boat service on Lake Chelan. The communities of Stehekin, Lucerne, and Holden are primarily accessed by boat, or float plane. A National Park Service boat is available for emergency transportation from the community of Stehekin to the City of Chelan. The National Park Service boat provides a valuable service in emergencies and is the only boat consistently available day or night for evacuation of severely ill or injured persons.

Passenger ferry boats, owned by the Chelan Boat Company, make scheduled daily round trips from the City of Chelan to Stehekin from March 15 through October 15, then provide reduced service of three or four trips per week the remainder of the year. U.S. mail is carried by the ferry system.

Commercial water transportation is primarily provided by Tom Courtney Tug and Barge and the Lake Chelan Boat Company. Barges provide the only means of transport of large goods, fuel, building supplies, vehicles, and gear not carried via smaller boat or plane. An additional small commercial boat service is also available on a limited pre-arranged basis from Chelan.

Docking facilities for private boats are located at Stehekin Landing, Weaver Point and Purple Point and in and around the City of Chelan.

There is no established commercial water transportation in the central or southern parts of the County. Recreational boating facilities are provided at various locations along the Columbia River, Lake Chelan, Fish Lake and Lake Wenatchee.

Emergency Service Facilities and Routes

There are no established emergency routes in the County designated for police, fire, or emergency medical service response. Emergency vehicles primary use arterial roads whenever possible (Personal Communication, K. Amaral, December 9, 1996). Emergency vehicle response times depend on traffic volume and level of service. The state routes and the arterial roads in the County seem to operate at an acceptable level of service. This means that emergency vehicles could respond to accidents and other issues in short time. Most of the fire districts are served by volunteers who respond from home or work which affects the response time for fire calls.

Non-Motorized Transportation

There are no significant stretches of roadway in the County with restricted pedestrian or bicycle usage, however, pathways and sidewalks are provided mostly, at limited locations within city limits and Urban Growth Area Boundaries urban areas or near transit stops. Pedestrian/bicycle/equestrian routes primarily serve recreational uses where available. In recent

years, the awareness of the potential for non-motorized transportation routes for non-recreational purposes has increased throughout the nation.

The Lake Chelan Recreation Association directed the preparation of the Lake Chelan Valley Public Trails Comprehensive Plan adopted by the Lake Chelan Recreation Association (LCRA) on March 13, 1996. The Plan was developed to serve as the foundation from which new trail projects in and around the lower Lake Chelan Valley will be selected and set into motion over the next 20 years. Lead by the LCRA, the findings of this plan reflect public preference and LCRA goals regarding trail types, quantities, locations, and design standards.

The primary goal of the plan was to identify conceptual trail project corridors that are instrumental to the completion of a multi-faceted, non-motorized trail system in the lower Lake Chelan Valley. In most cases, the corridor locations are general, and will not become specific until a detailed design study is addressed on a project by project basis. The top priority will be in the selection of specific trail routes in order to obtain the consent of all persons or agencies who own sections of the trail. As part of the planning process, a trail needs assessment was conducted and a trail project priority list was generated. The process of the analysis is described as follows:

In a 1995 Public Trail Survey, an overwhelming number of local respondents indicated a strong desire to see improved bike lanes that are safe and accessible year round, and additional multi-use paved trails similar to that in Chelan Riverwalk Park. The Public Trail Survey also placed a high priority on additional hiking trails and improved availability of restrooms, trail signs, maps, and parking.

With an estimated 50 percent increase in population over the next 20 years, a priority ranking of each trail type was proposed by the citizens in the Public Trails Survey and at a series of planning workshops. The top ten priorities identified were:

1. Bike Lanes
2. Paved Bicycle/Pedestrian/Multi-Use Trails
3. Tie between Hiking Trails & Restroom Facilities
4. Wider Shoulders on Roads
5. Shoreline Trails
6. Sidewalks
7. Trail Maps & Signs
8. Mountain Biking Trails
9. Trail Parking Areas
10. Tie between Cross Country Ski Trails and Crosswalks

This ranking was then translated into a trail project priority list for short range planning purposes (to be accomplished within 7 years shown in Table 6) and long range planning purposes (to be accomplished within 20 years shown in Table 7). It should be noted that the proposed projects lack a priority rating.

Bicycle Facilities

The Washington Department of Transportation (WSDOT) produces the *Washington State Traffic Data for Bicyclists* road map of which the primary purpose is to identify those segments of state highways and interstates that are closed for bicycling and identify traffic volumes on all sections. WSDOT has posted signs on those sections of highways where bicycling is prohibited. There are no state highways or interstates within Chelan County that prohibit bicyclists. In addition to roadway bicycling, the United States Forest Service (USFS) provides opportunities for mountain biking on many of their lands within Chelan County.

In the northern part of the County bicyclists frequently use the roadways in and around the town of Stehekin.

In the central part of the County. A class II bicycle route is proposed for the Leavenworth area. Within the City of Leavenworth, there is a designated bike path along SR-2 through town. The City has proposed development of bike paths along East Leavenworth Road, Icicle Road, Ski Hill Road, and in Trout Unlimited Park. The bike path in Trout Unlimited Park will include a pedestrian/bicycle bridge over the Wenatchee River (Personal Communication: Osborne, 1997).

In 1998 the Greater Wenatchee Bicycle Advisory Board issued a report, *Bicycle Routes Committee Report - 10/06/98*, that included bicycle route recommendations with recommendations for implementation throughout the greater Wenatchee Area. These recommendations were subsequently adopted by the Wenatchee City Commission and the Chelan County Board Of Commissioners (reported by Jim Ajax May 5, 1998).

Pedestrian Facilities

Pedestrian facilities are provided in the County in the form of both sidewalks and paths and trails. Sidewalks are used in the denser urban areas of the cities, such as Chelan, Wenatchee, Cashmere and Leavenworth, and their surrounding urban areas. Paths and trails are used in the less dense rural areas, mainly for recreation.

The City of Chelan has sidewalks in many areas of town, and requires they be constructed in new developments. The City of Leavenworth currently has some sidewalks, particularly in the downtown commercial area, and also requires they be provided for new development. There are sidewalks present in some unincorporated areas of the County adjacent to the cities. Additionally, pedestrian paths and trails within the County consist of established trails that are part of utility district, city, and county park systems and/or the United States

Forest Service (USFS) trails. USFS trails can be accessed from many locations throughout the County and are the primary source for trails within the region. Many National Park Service trails interconnect with USFS trails and/or originate from the Stehekin Valley.

The Chelan County Public Utility District has developed a number of parks within the northern part of the County that have trails. Chelan Riverwalk Park, located along the Chelan River in downtown Chelan, provides a 1 mile scenic river loop trail. Chelan Falls Park, a 53-acre park recently constructed along the banks of the Columbia River in the community of Chelan Falls provides a shoreline trail.

Trails within the incorporated cities in the northern part of the County include:

- Chelan Valley View Park and Trail Head, City of Chelan

There are several parks within the City of Leavenworth that have established trail systems; these facilities are described as follows:

- City Park located on Front Street in downtown Leavenworth provides walking trails and is accessible to the handicapped by means of sidewalk and several curb ramps
- Waterfront Park located along the Wenatchee River, two blocks from downtown is a 24-acre park with trails for walking and jogging. The park's primary drawback is its poor access from the main part of town and the need for improved pedestrian access to the main trail network.

Pedestrian paths and trails within the southern part of the County consist of USFS trails and established trails that are within parks developed by the Chelan County Public Utility District, that include: North and South Confluence Parks, Walla Walla Point Park and Riverfront Park. These park trails also connect with trails in East Wenatchee via the Odabashian Bridge (SR2/97) and a pedestrian bridge three miles to the south.

Equestrian Facilities

Most of the equestrian trails existing in Chelan County are on National Forest Land. No designated equestrian trails currently exist within the County, outside of State land and/or Federal Parks.

A good deal of riding and hiking takes place throughout the County along road rights-of-way and in other areas where a trail is not guaranteed to the user. Designated trails outside state-owned land in Chelan County are almost nonexistent with the exception of a few private routes and routes along existing roads that have been designated for tourist information but which have not been developed for safe utilization by bicycles, horses, or pedestrians.

Appendix A: Public Workshop Meeting Notices and Meeting Minutes

**Chelan County Natural Hazard Mitigation Plan
Update Proposal
Chelan County Emergency Management Council
March 2009**

Overview

The Chelan County Multi-Jurisdiction Natural Hazard Mitigation Plan was completed and adopted in October 2004 with subsequent approval by the Washington Emergency Management Division (EMD) and the Federal Emergency Management Agency (FEMA). The plan allows for jurisdictions within Chelan County to receive state and federal disaster relief and mitigation funds and essentially acts as an “insurance policy” to offset losses incurred as a result of natural disasters. Chelan County, the cities within Chelan County, and various districts, schools, hospitals, etc., must update the plan by February 2010 in order to remain eligible for state and federal disaster relief funds.

Original Plan Development

The original plan was developed through a collaborative effort lead by Chelan County Natural Resources and Chelan County Emergency Management using grant funds from WA EMD. The total cost to develop the original plan was approximately \$43,000, which included policy consultant costs (\$15,000), Natural Resource staff time (\$18,000), GIS consultant costs (\$5,000), public meeting and advertising costs (\$3,000), and plan production (\$2,000).

Update Proposal

We recommend using Chelan County Natural Resource staff to lead and coordinate the update effort with substantial assistance from Emergency Management staff. Given current budget constraints, we do not recommend using consultants but instead shifting those tasks to County staff. Additionally, other jurisdictions, particularly the cities, must contribute significant staff time to the update.

Update task assignments and associated cost

Chelan County Natural Resources

- Ensure compliance with EMD and FEMA update standards, including meetings with EMD and FEMA
- Write updated plan
- Assist cities and other jurisdictions with update
- Coordinate public review process

Cost:

Chelan County Emergency Management

- Review County Emergency Management procedures for compliance
- Update natural hazard history
- Provide administrative staff support

Cost:

ATTENTION LEGAL ADS

NOTICE

NOTICE IS HEREBY GIVEN that the Board of Chelan County Commissioners will hold three (3) public meetings to gather public input on the draft revised Chelan County Multi-Jurisdiction Natural Hazard Mitigation Plan. The Plan has been updated and revised since its adoption in 2005 to comply with the requirements of the Federal Disaster Mitigation Act. The plan addresses a variety of natural hazards and strategies to mitigate for those hazards, including flooding, earthquakes, severe storms, volcanic hazards, landslides, drought, wildfire and avalanche. The Plan covers Chelan County and the Cities of Cashmere, Chelan, Entiat, Leavenworth and Wenatchee. Chelan County Natural Resource Department staff will present the plan and gather public comments on the Plan.

The public meetings will be held on the following dates and locations:

May 3, 2011, 6:00 PM, Chelan County Commissioners' Chambers, 400 Douglas Street, Wenatchee, WA, 98801

May 4, 2011, 1:00 PM, City of Leavenworth Council Chambers, 700 US HWY 2, Leavenworth, WA 98826

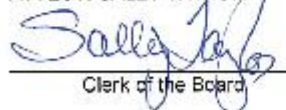
May 5, 2011, 4:00 PM, City of Chelan Council Chambers, 135 E. Johnson Avenue, Chelan, WA 98816

If you are unable to attend one of these meetings and would like to provide comments on the Plan, please contact Mike Kaputa at the Chelan County Natural Resource Department, 316 Washington Street, Suite 401, Wenatchee, WA, 98801; mike.kaputa@co.chelan.wa.us; (509) 670-6935. Comments on the Plan must be received by 5:00 PM, May 13, 2011.

DATED at Wenatchee, Washington this 11th day of April, 2011.



ATTEST: SALLY TAYLOR


Clerk of the Board

BOARD OF CHELAN COUNTY COMMISSIONERS


DOUG ENGLAND, CHAIRMAN


RON WALTER, COMMISSIONER


KEITH GOEHNER, COMMISSIONER

(Please publish once as soon as possible. Send bill and affidavit of publication to the Chelan County Natural Resource Department, 316 Washington Street, Suite 401, Wenatchee, WA 98801)

Chelan County Emergency Management Council Meeting
May 27, 2009

Natural Hazard Mitigation Plan Meeting

ATTENDEES:

Mike Kaputa, Chelan County Natural Resources
Bob Whitehall, City of Entiat
Keith Vradenburg, City of Entiat
Susan Driver, City of Entiat
Craig Gildroy, City of Chelan
Dave Schettler, City of Leavenworth
Eileen Ervin, Chelan County Sheriff's Office Emergency Management
Keith Goehner, Chelan County Commissioner
Gene Ellis, Chelan County Sheriff's Office Emergency Management
Stan Smoke, City of Wenatchee

AGENDA:

1. Welcome/Introductions
2. Previous plan development
3. FEMA update requirements
4. Next Steps

9:06 a.m. Commissioner Goehner called the meeting to order and turned the meeting over to Mike Kaputa.

Introductions were made.

The last plan was completed in October, 2004. We have a fairly tight time line to update the plan.

Documents were distributed. Mike will e-mail out the documents and will also work with IT to set up a website where he can post documents and information that may be needed.

Documents distributed: FEMA document, guidelines on updating the current plan
Jurisdiction-specific plan
First portion of existing plan

In 2004 the first plan was put together with the Chelan County Emergency Management Council. Page 9 of the FEMA guidelines shows a chart of how the plan comes together. We worked with 2 groups, the EM Council and a Staff development group. Our Staff development group would be comparable to the Planning Team of Direct Representatives as shown on the chart.

Chelan County Emergency Management Council
Natural Hazard Mitigation Plan Meeting
October 7, 2009

Draft should be done in about 2 weeks. Will be meeting with WA EMD on October 30th to review. Have questions about a few issues. One issue is the involvement of smaller districts – don't believe they have to be in the plan when submitted, but there is a process for them to opt-in later if they want. Also need to check on Benefit Cost Analysis --- don't believe this will have to be redone, but will check with EMD to be sure that what we have is sufficient.

Will have one general public meeting before meeting with the city councils and the county commission -- will need at least an intent to adopt resolution when the plan goes in in February 2010.

Mike will create a cover memo describing changes in the plan, a sample resolution for the intent to adopt, and a copy of the draft plan for the cities.

After meeting with EMD in October, hope to do changes to the plans in November, council meetings in December, and proceed to adoption or intent to adopt in January -- with plan submitted to EMD in February. After EMD reviews it the plan will be submitted to FEMA. It may take several months for EMD/FEMA to review due to numerous plans being due in the same time frame.

The subplans for the cities are looking good. The subplan for the county is still being worked on and is being matched up to the Chelan County Comprehensive Plan.

Reference the grant --- we had a concern that the grant funding would come late, if ever --- it appears that it will be late, if ever. Cannot go back on expenses incurred prior to the grant being issued. So there will probably not be any funds available for costs associated with the updates.

Appendix B: Natural Hazard Maps

