Appendix A
Public Participation and Outreach Materials

The hazards mitigation planning process engaged the public and a variety of stakeholders at Emergency Preparedness Expos, community meetings and events, and an open house meeting. Appendix A includes a sample of these materials.

• A-1: Invitation to Plan Partners to Participate in the Plan Update
• A-2: Statement of Intent to Participate
• A-4: Disaster Declarations of Thurston County Poster
• A-5: Hazards Assessment GIS Story Map Poster
• A-6: Bookmarks
• A-7: Hazards Mitigation Plan Open House Press Release
• A-8: The Chronicle News Article for Open House Meeting
• A-9: Open House Meeting Flyer
• A-10: Risk Assessment Poster
• A-11: Earthquake Hazards Poster
• A-12: Storm Hazards Poster
• A-13: Flood Hazards Poster
• A-14: Landslide Hazards Poster
• A-15 Wildland Fire Hazards Poster
• A-16: Lahar Hazards Poster
• A-17: Other Hazards Poster
• A-18: Plan Goals and Objectives Poster
• A-19: Countywide Mitigation Initiatives Poster
• A-20: Draft Plan Comment Form
• A-21: Open House Meeting Feedback and Evaluation Form
• A-22: Project Website
• A-23: The Olympian News Article for Draft Plan
• A-24: Legal Notice for Draft Plan
• A-25: Public Comments
A-1: Invitation to Plan Partners to Participate in the Plan Update

Paul Brewster

From: Steve Romines <romines@co.thurston.wa.us>
Sent: Thursday, September 04, 2014 6:25 PM
To: chairman@chehalistribe.org; aryder@ci.lacey.wa.us; citymanager@ci.lacey.wa.us; sbuxbaum@ci.olympia.wa.us; shall@ci.olympia.wa.us; mayor@ci.tenino.wa.us; jdoan@ci.tumwater.wa.us; pkmet@ci.tumwater.wa.us; mayorofci.yelm.wa.us; shellyb@ci.yelm.wa.us; Cliff Moore; Sandra Romero; Karen Valenzuela; Cathy Wolfe; teninocityhall@comcast.net; mayorofrainier@fairpoint.net; iyall.cynthia@nisqually-nsn.gov; mayorofbucoda@scattercreek.com; Rainier@ywave.com
Cc: ALoudermilk@chehalistribe.org; rwyman@chehalistribe.org; bdileona@ci.lacey.wa.us; gwright@ci.olympia.wa.us; dginther@ci.tumwater.wa.us; todds@ci.yelm.wa.us; Kathy Estes; Sandy Johnson; Andrew Kinney; Cushman.joe@nisqually-nsn.gov; kautz.joe@nisqually-nsn.gov; Fred Evander

Subject: Invitation to Make Our Communities Safer
Attachments: Hazard Mitigation Plan Overview.docx; HMP_Statement_of_Intent.doc

Dear Community Leader,

On behalf of the Thurston County Emergency Management Council, I invite your community to participate in the update to the Thurston County region’s Hazards Mitigation Plan. While the region is generally safe and secure, we are vulnerable to the effects of earthquakes, volcanic eruptions, landslides, severe winter storms, flooding, and wildfires. Natural disasters and technological hazards are devastating and can severely disrupt life in our communities. Recent events in neighboring counties illustrate this fact. While we can’t prevent nature’s outbursts, we can understand the risks that certain hazards pose and take steps to avoid or minimize their impacts.

The Hazards Mitigation Plan for the Thurston Region is a multi-jurisdictional plan that identifies and prioritizes sustained measures that if enacted, will help communities break the disaster cycle. States, local governments, and tribes perform hazard mitigation planning and adopt federally approved strategies as a precondition for receiving funding from a variety of federal grants such as the Hazard Mitigation, Pre-disaster Mitigation, and Flood Mitigation Assistance programs. These grant programs help finance important projects that make our communities safer. To maintain compliance with these programs, the Federal Emergency Management Agency (FEMA) requires that communities maintain and update their plans every five years. The current plan (second edition) was adopted in 2009 and will expire this November.

In 2012, we asked communities to sign a “Statement of Intent to Participate” in the plan update. Your jurisdiction’s commitment assisted Thurston County with receiving a grant to update the plan. While this grant covers most of the cost to update the plan, it requires a local match. Your organization’s participation, in the form of in-kind staff contributions to the planning process, will fulfill the grant’s match requirements.

Thurston County Emergency Management is partnering with Thurston Regional Planning Council to facilitate and manage the planning process. This planning process is expected to run from September 2014 to October 2015. Local adoption is likely to occur around December 2015. Your jurisdiction can learn more about the plan and the update process by attending a Mitigation Planning Workgroup meeting on September 18 at the Thurston County Emergency Coordination Center (Tilley Road) at 1:00 p.m.

To reconfirm your jurisdiction’s commitment to the plan update process, please review and re-sign the “Statement of Intent to Participate” (attached with this email). This statement will serve as a partners’ agreement to fulfill all of the prerequisite planning requirements that are necessary to obtain FEMA’s approval prior to local adoption. Your Emergency Management Council representative will assist you in completing this first step.
Please contact Paul Brewster, Senior Planner at TRPC if you have questions: brewstp@trpc.org or 956-7575.

Sincerely,

Steve Romines, Director
Thurston County Emergency Services
Chair, Thurston County Emergency Management Council

cc: City Managers
    Emergency Management Council Representatives
Natural Hazards Mitigation Plan Update
Statement of Intent to Participate
For the
Thurston County, Washington Region

Purpose: The purpose of this Statement of Intent (SOI) is to provide a mutual understanding in support of the signatory local governments, school districts, special purpose districts, colleges and universities, and other organizations that will be working in cooperation to complete an update to the multi-jurisdictional "Natural Hazards Mitigation Plan for the Thurston Region." This SOI serves as the "partners' agreement."

Background and Federal Policy: The Hazard Mitigation Grant Program (HMGP) is a federally funded program managed by the Washington Military Department's Emergency Management Division (State EMD). It provides grant funds for hazard mitigation plans and projects that reduce casualties and damage to structures in future disasters. This grant program, made available following Presidential Disaster Declarations, is funded by the Federal Emergency Management Agency (FEMA), and authorized by Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act.

Cities, towns, counties, tribes, ports, school districts, and other special purpose local governments must have a FEMA-approved mitigation plan developed under 44 CFR Part 201 as a condition of receiving federal HMGP funds for mitigation plans or projects. Plans must be updated every five years in order to remain eligible for federal mitigation assistance. The current "Natural Hazards Mitigation Plan for the Thurston Region" (2nd edition) expires on November 24, 2014.

Roles and Expectations: Consistent with the region's previous planning framework, the Thurston County Emergency Management Council will serve as the Steering Committee to direct the development of the plan. A multi-jurisdictional Hazard Mitigation Planning Workgroup composed of designees from each of the participating partners, will build the plan.

For the Hazard Mitigation Plan update process, signatory participation is defined as:

1. Designating a lead point of contact to represent the partner agency's interests on the regional Hazard Mitigation Plan Workgroup
2. Participating in the planning process including the Hazard Mitigation Plan Workgroup meetings, public meetings or open houses, workshops, planning partner specific training sessions, or public review and comment periods.
3. Providing reasonable support in the form of data, mailing lists, meeting space, and public information materials to solicit public participation in the planning process.
4. Conducting relevant jurisdiction specific meetings to review and refine its hazard mitigation capabilities, its risk assessment, and prioritize its mitigation strategy.
5. Creating and prioritizing a mitigation strategy that will identify each project, the responsible entity for overseeing the project, how it will be financed, and when it is estimated to occur.
6. Formally adopting the regional plan and a jurisdiction-specific mitigation strategy.

Joinability: It is expected that there will be interested parties not currently included in this SOI that will request inclusion at a later date. Other jurisdictions may be included in the regional plan update considering that they actively participate in all of the roles and expectations as outlined above.
AGREEMENT:

Whereas, the Federal Disaster Mitigation Act of 2000 requires that for all disasters declared on or after November 1, 2004, local and tribal government applicants must have an approved local mitigation plan in accordance with 44 CFR 201.6 prior to receipt of Hazard Mitigation Grant Program project funding; and

Whereas, Thurston County residents, businesses, and local governments are subject to frequent impacts from the destructive effects of flooding, winter storms, landslides, earthquakes, wildland fires, and other natural hazards that has resulted in 24 Presidential Disaster Declarations since 1965; and

Whereas, a multi-jurisdictional mitigation plan represents the commitment of jurisdictions to reduce risks from multiple hazards, serving as a guide for decision makers as they commit resources to reducing the effects of natural hazards, and is in the public interest to proceed with the multi-jurisdictional grant application and planning process in a timely manner; and

Whereas, an open public involvement process is essential to the development of an effective plan, and the process will be coordinated with affected jurisdictions, agencies, businesses, academia and other private and non-profit interests in the county to insure a comprehensive approach to mitigating the effects of natural disasters; and

Whereas, the plan shall include documentation of the planning process, and a risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses, sufficient to enable each jurisdiction to identify and prioritize appropriate mitigation actions, a detailed mitigation strategy that provides the blueprint for reducing the potential losses identified in the risk assessment, a five year cycle for plan maintenance, and documentation of formal adoption by each participating jurisdiction; and

Whereas, the signatories agree to the best of their abilities and within the limits of their resources to work cooperatively on the project; and

Now, Therefore, this SOI is established to create a framework for coordinating efforts related to successfully completing the work funded under a Hazard Mitigation Grant Program grant or other relevant source of funding.

SIGNATORIES:

The undersigned individuals hereby commit to this SOI on behalf of their respective agencies. This SOI may be executed in one or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. Each Party has signed this two-page SOI. The original signature pages are on file at the Thurston Regional Planning Council: 2424 Heritage Ct. SW, Suite A, Olympia, WA 98502-6031, Phone: (360) 956-7575.

[Signature]
Pete Kmet, Mayor
City of Tumwater

Emergency Preparedness Expo

Hope for the Best... Prepare for the Worst!

Saturday, September 27, 2014
10:00 a.m. ~ 3:00 p.m.
Peter G. Schmidt Elementary School
225 Dennis St. Tumwater

FREE Vendor Booths, Preparedness Info, and More!!

Guest Speakers/Schedule:

10:30 a.m. Living with Mt. Rainier, Our Backyard Volcano
Carolyn Driedger, Hydrologist, USGS

11:30 a.m. SR 530, Oso Landslide – Volunteer Management
Bob Bippert, WA EMD

12:30 p.m. Run, Hide, Fight, Active Shooter Forum
Scott Eastman, Lacey PD and Alex Christiansen, Lacey FD

Highlights:

• K9 Demonstration
• Tiller Fire Truck & Jaws of Life
• Safe Kids Thurston County
• Fire Extinguisher Safety
• WA National Guard
• And much, much more!

Details: 360-867-2800
www.co.thurston.wa.us/em/expo

If you require special accommodations, please call 360-867-2825 by Sept. 15, 2014.
Hope for the Best . . . Prepare for the Worst

Emergency Preparedness Expo

Saturday, September 26, 2015
10:00 a.m. ~ 3:00 p.m.
Yelm High School
1315 W. Yelm Ave., Yelm, WA

Guest Speakers:

10:30 a.m.
Ted Buehner, National Weather Service
Winter Weather Outlook & Impacts

1:00 p.m.
Andrew Kinney, TC Emergency Mgmt.
Thurston County Hazards

Expert speakers and vendors with information on emergency preparedness, food storage and other topics.
Games, door prizes and more!

Details: 360-867-2825
www.co.thurston.wa.us/em/expo
EMERGENCY Preparedness Expo

BECAUSE EVERYTHING CAN CHANGE IN A HEARTBEAT . . .

Saturday, Sept. 17 2016
10:00 am — 3:00 p.m.

Rochester Middle School
9937 US-Hwy 12
Rochester, WA

Get in FREE for

Expert Speakers and Vendors with information on getting YOU prepared!

Learn about food storage, what supplies to have and taking care of your pets. Learn to prepare for the unexpected!

Guest Speakers:

10:30 a.m.
Tim Walsh, DNR
Natural Hazards in Your Backyard

1:00 p.m.
Capt. Lanette Dyer, West Thurston Fire
Learn Pet CPR

Details: 360-867-2825
www.co.thurston.wa.us/em/expo

Sponsored by Thurston County Emergency Management Council and West Thurston Fire
HAZARD MITIGATION BREAKS THE DISASTER CYCLE

Storm, Flood, Earthquake, Wildland, Fire, Landslide, Volcanism

“All Sectors of the community work together to create a disaster resilient community”
A-5: Hazards Assessment GIS Story Map Poster

Is your home vulnerable to...
- Flood?
- Earthquake?
- Landslide?
- Lahar?
- Wildland Fire?

What about your...
- Child’s school?
- Workplace?
- Municipal water supply?
- Fire station?
- Health care facilities?
- Other public facilities?

Know your risks... It’s Easy! It’s Free! No Registration required.

Thurston Region Hazard Assessment Map Tool
trpc.maps.arcgis.com

Bookmark it for later.

Thurston Region Hazard Assessment Map Tool
trpc maps arcgis com
FOR IMMEDIATE RELEASE: Friday, December 9, 2016

CONTACT: Paul B. Brewster, Senior Planner, Thurston Regional Planning Council, 360-741-2526, or brewstp@trpc.org

Public Invited to Hazard Mitigation Plan Open House
Help map out plans that will lessen the impacts from future disasters

OLYMPIA – Thurston County residents are invited to review local government efforts to reduce losses from future disasters and help update current plans. The Hazards Mitigation Plan for the Thurston Region is a multi-jurisdictional plan that identifies and prioritizes sustained measures that will help communities break the disaster cycle.

States, local governments, and tribes perform hazard mitigation planning and adopt federally approved strategies as a precondition for receiving a variety of federal grants. They include Hazard Mitigation, Pre-disaster Mitigation, and Flood Mitigation Assistance programs. These grants finance projects to make our communities safer. To maintain eligibility for these programs, the Federal Emergency Management Agency (FEMA) requires that communities maintain and update their plans every five years.

Thurston Regional Planning Council (TRPC) is partnering with local governments to update the plan. Community members are invited to attend an open house on Wednesday, December 14 from 5-7 p.m. Attendees will learn about the hazards that pose the greatest risks to the region. Participants can view information about the hazards, how they may pose a risk to their property, and comment on the plan’s draft mitigation activities. No presentations are scheduled, but staff will be available to answer questions and solicit feedback for the plan update.

Attendees can:
- Discover which hazards pose the greatest risk
- Use interactive maps to see what hazards affect where they live or work
- View and comment on elements of the Draft Hazards Mitigation Plan
  - Goals and objectives
  - Mitigation activities
  - And Share your ideas

What- Thurston County Hazards Mitigation Plan Open House
When- 5pm, Wednesday, December 14, 2016
Where- Thurston County Emergency Management, 9521 Tilley Road S. Olympia WA 98512

-30-
Public Invited to Thurston County Hazard Mitigation Plan Open House

By The Chronicle Dec 13, 2016 0

Thurston County residents are invited to review local government efforts to reduce losses from future disasters and help update current plans.

The Hazards Mitigation Plan for the Thurston Region is a multi-jurisdictional plan identifying and prioritizing sustained measures that will help communities break the disaster cycle, stated in a press release from the Thurston Regional Planning Council.

The council is partnering with local governments to update its plan. To maintain eligibility for programs that include hazard mitigation, pre-disaster mitigation andlood mitigation assistance, the Federal Emergency Management Agency requires that communities maintain and update their plans every five years.

States, local governments and tribes perform hazard mitigation planning and adopt federally approved strategies as a precondition for receiving a variety of federal grants, stated the release.

Community members are invited to attend the open house from 5 to 7 p.m. on Wednesday, Dec. 14. Those in attendance will learn about the hazards that pose the greatest risks to the region. Participants can view information about the hazards, how they may pose a risk to their property, and comment on the plan’s draft mitigation activities.

County staff will be available to answer questions and solicit feedback for the plan update. No presentations are scheduled.

The open house will be held at Thurston County Emergency Management, 9521 Tilley Road S., in Olympia.
A-9: Open House Meeting Flyer

For more information contact Paul Brewster, brewstpc@trpc.org or call 360-741-2526

HAZARDS MITIGATION PLAN

OPEN HOUSE

DEC 14 5-7 PM

THURSTON COUNTY EMERGENCY MANAGEMENT
9521 TILLEY RD S, OLYMPIA, WA 98512

All sections of the community work together to create a more disaster resilient region.

- Discover which hazards pose the greatest risk.
- Use interactive maps to see what hazards affect where you live or work.
- View and comment on elements of the Draft Hazards Mitigation Plan.
- Discuss goals and objectives.
- Share your ideas.

If you need special accommodations to participate in this meeting, please call us at 360-552-5757 by 11:00 a.m. three days prior to the meeting. Ask for the ADA Coordinator. For TDD users, please use the state’s toll free relay service at 711 and ask the operator to dial 360-552-5757.

March 2017

Hazards Mitigation Plan | ApxA-14
Appendix A: Public Participation and Outreach Materials

RISK ASSESSMENT

RISK

Risk, for the purpose of hazard mitigation planning, is the potential for damage, loss, or other impacts created by the interaction of natural hazards with community assets.

STEPS TO CONDUCT A RISK ASSESSMENT

For multi-jurisdictional hazard mitigation plans, the risk assessment must result in an evaluation of potential impacts and overall vulnerability that each participating jurisdiction will use to develop specific mitigation actions. Assets, vulnerabilities, and overall risk are unique to each community and must be addressed. Although hazards may be described for the entire planning area, the plan also must explain any hazards that are unique or varied within communities. For the Thurston Region Hazard Mitigation Plan, each community assesses its unique impacts in their annex to the plan.

Describing Hazards

The plan is required to include a description of the type of all of the natural hazards that can affect the community. The Thurston Region’s plan includes both natural and other technological or human-induced hazards. For each hazard affecting the planning area, the risk assessment must include a description for each of the following:

- Location
- Extent
- Previous occurrences
- Probability of future events

Hazard Profiles

Every hazard that is profiled in this plan meets one or all of the following criteria:

1. There is a high probability of the natural hazard occurring in Thurston County within the next 25 years; and/or
2. There is the potential for significant damage to impacted buildings and infrastructure; and/or
3. There is the potential for loss of life.

The following hazards meet one or more of the above criteria and are profiled in this plan: 1) Earthquake; 2) Flood; 3) Landslide; 4) Storm; 5) Volcanic Lahar; and 6) Wildland Fire.

For each of these hazards, an assessment of the region’s population, employment, residential units, valuation of assets, and essential facilities is provided. The portion of the region that is in or out of an area potentially affected by a hazard is summarized. Additional data and maps of hazard areas are also included. Loss estimation analysis, provided by HAZUS modeling software, is also included. Loss estimation analysis is only available for earthquake and flood. The hazard profiles are simplified summaries of the hazard profiles.

MEASURING RISK

Hazard Analysis Definitions

The Thurston Region Hazard Mitigation Plan uses a subjective risk measurement process based on Thurston County’s Hazard Inventory and Vulnerability Assessment or HIVA. This methodology rates elements of each hazard’s risk characteristics using adjective descriptors such as high, moderate, and low. These descriptors are applied to the hazards’ probability of occurrence, vulnerability, and overall risk. The following is an overview of the risk measurement process:

Risk Rating: An adjective description (High, Moderate, or Low) of the overall threat posed by a hazard is assessed for the next 25 years. Risk is the subjective estimate of the combination of any given hazard’s probability of occurrence and the region’s vulnerability to the hazard.

- High: There is strong potential for a disaster of major proportions during the next 25 years; or history suggests the occurrence of multiple disasters of moderate proportions during the next 25 years.
- Moderate: There is medium potential for a disaster of less than major proportions during the next 25 years.
- Low: There is little potential for a disaster during the next 25 years.

Probability of Occurrence: An adjective description (High, Moderate, or Low) of the probability of a hazard impacting Thurston County within the next 25 years.

- High: There is great likelihood that a hazardous event will occur within the next 25 years.
- Moderate: There is medium likelihood that a hazardous event will occur within the next 25 years.
- Low: There is little likelihood that a hazardous event will occur within the next 25 years.

Vulnerability: Vulnerability can be expressed as combination of the severity of a natural hazard’s effect and its consequential impacts to the community. An adjective description (High, Moderate, or Low) of the potential impact a hazard could have on Thurston County. It considers the population, property, commerce, infrastructure and services at risk relative to the entire county.

- High: The total population, property, commerce, infrastructure and services of the county are uniformly exposed to the effects of a hazard of potentially great magnitude. In a worst-case scenario, there could be a disaster of major to catastrophic proportions.
- Moderate: The total population, property, commerce, infrastructure, and services of the county are exposed to the effects of a hazard of moderate influence; or the total population, property, commerce, infrastructure, and services of the county are exposed to the effects of a hazard of moderate influence, but not all to the same degree; or an important segment of population, property, commerce, infrastructure and services of the county are exposed to the effects of a hazard. In a worst-case scenario there could be a disaster of moderate to major, though not catastrophic, proportions.
- Low: A limited area or segment of population, property, commerce, infrastructure, or service is exposed to the effects of a hazard. In a worst-case scenario, there could be a disaster of minor to moderate proportions.

RISK ASSESSMENT SUMMARY

Using this criteria, the six hazards profiled in this plan receive the following risk ratings:

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Probability of Occurrence</th>
<th>Vulnerability</th>
<th>Risk Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earthquake</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Flood</td>
<td>High</td>
<td>Moderate</td>
<td>High</td>
</tr>
<tr>
<td>Landslide</td>
<td>Moderate</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>Storm</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Volcanic Lahar</td>
<td>Low</td>
<td>High</td>
<td>Moderate</td>
</tr>
<tr>
<td>Wildland Fire</td>
<td>High</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

For further information or to view the current “Hazards Mitigation Plan for the Thurston Region,” visit www.trpc.org/hazards.
EARTHQUAKE

HAZARD DESCRIPTION
An earthquake is the sudden release of energy bound in a fault within the earth. They cause the most widespread damage to transportation, communications, utilities, buildings, business, and disruption to services across all sectors of society. Earthquakes are among the most feared natural hazards because they strike without warning and cause ground shaking, ground failures, liquefaction, tsunamis, and fires.

Spotlight: 2001 Nisqually Earthquake
On February 28, 2001, a 6.8 magnitude earthquake from 30 miles below the Nisqually River Delta shook the Pacific Northwest. In the day after the quake, a Presidential Disaster Declaration was issued.

Impacts
- Deaths and injuries: 1 death; 400 injuries
- Applicants for federal disaster assistance: 41,414
- Total damage estimates: $1 - $4 billion
- Federal assistance to date: $34 million
- Building Damage:
  - Downtown Olympia and Seattle's Pioneer Square area hit hard.
  - Several of the government buildings in Olympia, including the capital, were significantly damaged.
  - Damage to homes came in a variety of forms; chimney failure was the most common.
- Transportation Damage:
  - Serious damage to Seattle-Tacoma International Airport
  - 4th Avenue Bridge and Deschutes Parkway in Olympia were destroyed and remained closed until reconstructed.
- Other Impacts: landslides, power outages, some damage to dams, landline and wireless communications were overwhelmed by caller demands.

For further information or to view the current “Hazards Mitigation Plan for the Thurston Region,” visit www.trpc.org/hazards.

ASSESSING VULNERABILITY
There is a high probability of a destructive earthquake occurring in the next 25 years. A significant portion of the population lives in areas prone to liquefaction. Damage estimates from earthquake models and losses from historic events indicate that the region remains highly vulnerable. Accordingly, Thurston County is assigned a high-risk rating for major earthquakes.

Delineation of the Liquefaction Hazard Area
Liquefaction is the phenomenon of soils behaving like viscous fluid from strong ground shaking. Liquefaction causes two types of ground failure: lateral spread and loss of bearing strength. Lateral spreads develop upon gentle slopes and entail the side-to-side movement of large masses of soil as an underlying layer liquefies. Loss of bearing strength results when the soil supporting a structure liquefies, causing structures to subside and/or tip.

Liquefaction typically occurs in artificial fills and in areas with loose sandy soils that are saturated with water, such as low-lying coastal areas, lakeshores, and river valleys. Areas at risk to liquefaction are shown on the map on the right.

Population and Employment in the Hazard Area
Presently, nearly 99,000 people (37%) and 43,400 dwellings are located in areas with a moderate to high risk for liquefaction. Countywide, approximately 70,300 people work in liquefaction prone areas.

Inventory of Assets and Dollar Value in the Hazard Area
Nearly $5.3 billion in residential, $1.5 billion in commercial/industrial, and $2.1 billion in government/structural estimated property valuation is within areas at moderate to high risk.

Each whole number increase in magnitude represents a ten-fold increase in measured amplitude, and about 33 times more violent energy released in the form of seismic waves than the magnitude that produced it.
HAZARDOUS WEATHER: PRECIPITATION

1. High Winds/Windstorms

The National Weather Service defines high winds as “sustained wind speeds of 40 mph or greater lasting 1 hour or longer, or winds of 58 mph or greater for any duration.” Generally, winds above 30 mph can cause widespread damage and those above 50 mph can lead to more serious damages. Most large windstorms that affect the region are delivered by mid-latitude Pacific cyclones. While not as powerful as tropical hurricanes, these cyclones can generate wind speeds in excess of 100 mph and can maintain their strength farther inland.

2. Heavy Rain

Heavy rainfall is any amount of rain produced in a relatively short period that exceeds the capacity of natural systems’ or stormwater infrastructures’ ability to effectively and safely convey the flow of stormwater. The most common impacts from heavy rainfall are flooding and erosion. Prolonged rain delivered by weather systems north of the Hawaiian Islands disturbed atmospheric rivers, can rapidly melt snow in the Cascade Mountains and lowlands. This precipitation causes rivers to rise quickly cause flooding downstream in valleys and widespread landslides both in the uplands and the lowlands. Local rainfall also swells local creeks and streams, exacerbating local flood potential.

3. Freezing Rain

Freezing rain occurs when rain descends through a cold air mass, cools, and subsequently freezes on contact with cold surfaces. An ice coat will continue to accumulate on surfaces as long as conditions exist. Ice can accumulate to thicknesses greater than one inch.

4. Heavy Snow

The Washington State Hazard Mitigation Plan defines heavy snow as “four inches of snowfall in 12 hours or six inches in 24 hours for non-mountainous areas. This amount is sufficient to disrupt activities in Thurston County. Falling snow mixed with high winds produces a blizzard. The National Weather Service defines a blizzard as “…three hours or more of sustained wind or frequent gusts to 35 miles per hour or greater; and considerable falling and/or blowing snow (i.e., reducing visibility frequently to less than ¼ mile).”

The average annual snowfall for Thurston County is approximately 17 inches (average maximum of all weather stations in Thurston County, 1948-2015). Most snow events are very short and delivered as a single heavy snowfall. However, local weather station records indicate that local heavy snowfall events have occurred 39 times since 1946.

5. Tornado

The National Weather Service defines a tornado as “a violently rotating column of air, usually pendant to a cumulonimbus [cloud], with circulation reaching the ground. It nearly always starts as a funnel cloud and may be accompanied by a loud roaring noise. On a local scale, it is the most destructive of all atmospheric phenomena.”

In western Washington, tornados have occurred during the months of January, March, April, May, June, August, September, October, November, and December. A total of 194 tornados have been documented in Washington State between 1950 and 2005. Of these, 46 were F0, 29 were F1, 12 were F2, and 3 were F3. Damaging tornados are rare in Thurston County, and none have adversely affected densely populated areas. Between 1950 and 2008, four small tornados (three F0, and one F1) occurred in Thurston County near Bucoda, Tenino, Yelm and Lacey in 1994, 2003, 2004, and 2006 respectively.

6. Hail

Hail is precipitation that takes the form of ice balls or clusters of ice clumps, ranging from two-tenths of an inch to several inches in diameter. Hail forms in cumulonimbus or thunderstorm clouds that have strong updrafts. Most hail storms in Thurston County produce small non-destructive hail. The records of damaging hail storms are scant and suggest limited damage from these events with only small geographical areas likely affected. Hail storms may damage crops, but the extent of hail damage to agriculture within Thurston County is unknown.

Lightning storms in Thurston County are short lived and generally only a small area. Historically, lightning has not caused widespread damage locally. Since 1960, at least 11 lightning storms have caused $207,808 in property damage in Thurston County. Since 1972, lightning ignited at least 28 wildland fires. A total of 28 acres are known to have burned. The largest fire burned 15 acres on private timberland in a remote area of southeast Thurston County in June 2004.

VULNERABILITY

Severe storms have a high probability of occurrence. Historical damage and cumulative costs of destructive storms suggest high vulnerability. Accordingly, a high risk rating is assigned.

<table>
<thead>
<tr>
<th>Probability of Occurrence</th>
<th>Vulnerability</th>
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<td>High</td>
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For further information or to view the current “Hazards Mitigation Plan for the Thurston Region,” visit www.trpc.org/hazards.
FLOOD The Region’s Most Pervasive Hazard

HAZARD DESCRIPTION
Flooding is a natural cycle of streams and rivers. It occurs when the volume of precipitation or melting snow pack exceeds the capacity of river banks to keep flowing waters contained. Of all natural hazards that affect Thurston County, floods are the most common and, on an annual average basis, the most costly. Thurston County has been declared a Federal Disaster Area 18 times since 1962.

Several factors determine the severity of floods:
- Precipitation intensity and duration
- Soil saturation conditions
- Topography and ground cover
- Amount of snow

Four types of flooding occur in Thurston County:
1. River or stream flooding occurs with prolonged heavy rainfall, a rapidly melting snow pack or a combination of these.
2. Urban flooding results from intense storms dropping large volumes of rain within a short period of time, exceeding the capacity of stormwater management systems.
3. Tidal flooding occurs when extremely high tides combine with low atmospheric pressure, excessive run-off, or strong northerly winds. The tides can also enhance flooding in delta areas where rivers or creeks are at or near flood stage. Sea level rise will exacerbate tidal flooding.
4. Groundwater flooding occurs when there is a high water table and persistent heavy rains. The situation is caused in areas where an upper thin layer of permeable soils overlies an impermeable layer of hardpan. As the ground absorbs more and more rain water, the groundwater table rises and shows itself as flooding in areas where the land surface is below the water table. The 1998-1999 flood is the groundwater flood of record.

ASSESSING VULNERABILITY
The history of major flooding within the Thurston Region clearly demonstrates a high probability of occurrence. Because of the relative land area and population affected by flooding, the county’s vulnerability is rated as moderate. On a jurisdictional basis, an exception is the Town of Buckley, which has a high vulnerability due to the extent of the 100-year flood plain in the community. Countywide, the frequency of flooding, the potential for simultaneous flooding events, plus the historical record of recurrent flooding and cumulative costs, all lead to the assignment of a high risk rating.

<table>
<thead>
<tr>
<th>Probability of Occurrence</th>
<th>Vulnerability</th>
<th>Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>Moderate</td>
<td>High</td>
</tr>
</tbody>
</table>

For further information or to view the current “Hazards Mitigation Plan for the Thurston Region,” visit www.trpc.org/hazards.
LANDSLIDES AND DEBRIS FLOWS

HAZARD DESCRIPTION

Landslides are the movement of rock, soil, or other debris, down a slope. In general, the term landslide includes a wide range of ground movement, such as rock falls, and shallow or deep failure of slope.

Debris flows (or mudflows) are conglomerations of rock, earth, and other debris saturated with water. They develop when water rapidly saturates the ground from precipitation or a sudden influx of water that destabilizes the ground. As materials give way to gravity and move down a slope, a flowing river of mud or “slurry” can reach avalanche speeds and grow as it picks up trees, rocks, and other materials along the way.

Landslides occur naturally from heavy rains or snow storms, earthquakes, and volcanoes. However, a landform’s stability can be compromised by human activity such as construction of buildings or other infrastructure, logging, and mining near or along steep slopes.

Historical Occurrences and Impacts

The State of Washington rates landslide losses second to flood losses for the state as a whole with the Puget Sound area having the greatest vulnerability.

March 22, 2014 Federal Disaster 4168: Washington Flooding and Mudslides, Oso or “SR530 Landslide,” Snohomish County, Washington

On March 22, a massive landslide occurred 2 miles east of Oso along State Route 530. Higher than normal rainfall contributed to the collapse of an unstable slope north of the Stillaguamish River. The landslide generated a massive debris-avalanche flow that crossed the river and covered nearly one-half square mile. The landslide killed 43 people and buried over 40 homes and other structures in a rural neighborhood known as Steelhead Haven.

This tragic landslide was much larger, traveled much further, and had a greater destructive force than others previously experienced at or near the site. The United States Geological Survey states that the landslide moved 18 million tons of sand, till, and clay—enough material to cover approximately 600 football fields 10 feet deep. The landslide was believed to have traveled 40 miles per hour.

December 3-7, 2007 Federal Disaster 1734: Severe Winter Storms, Flooding, Landslides, and Mudslides

On December 3, an estimated 97 households were isolated by a complete washout of Cedar Flats Road. Washington State Department of Natural Resources found that heavy “…warmer rains easily melted snow on the ground in Capitol State Forest, saturating soils that began to slide. Three landslides on the tributary to Swift Creek triggered three debris flows, carrying debris and sediment into Swift Creek and creating a hyper concentrated flow. The debris clogged the culvert where Swift Creek flows under Cedar Flats Road.” The clogged culverts impeded creek flow and forced the surrounding embankment under the road to wash out. The county opened a temporary 1.5 mile detour route that served residents for several months until a temporary bridge was constructed. The emergency detour route construction cost approximately $135,000 and construction of the temporary and new bridges cost $891,000.

On December 3, another mudslide on Kennedy Creek Road in northwestern Thurston County destroyed the Ranch House BBQ restaurant and surrounding structures. Damage was estimated at $1 million. Slides also caused at least two homes to be tagged as uninhabitable off Sunset Beach Road.

Winter 1998-99, South Puget Sound Landslides

Three years of above average winter rainfall contributed to a massive slide in the Carlyon Beach area. The 66-acre landslide left 40 homes uninhabitable.

December 1996 to March 1997 Rainstorms

Following several rain storms, sections of the coastal bluff near Hunter Point across from Squaxin Island slid a few feet resulting in two residences being declared unsafe to occupy. A separate slide south of the City of Rainier threatened a section of the Northwest Pipeline and the disruption of natural gas distribution. A 26-inch diameter line was shut down, but gas was diverted to another line.

February 1996 Flooding

Sections of a bluff slid into the Nisqually River near Yelm. Several residences were declared unsafe to occupy. Another landslide broke the two main sewer lines that carried the majority of Tumwater’s and the former Olympia Brewery’s wastewater to the DOTT treatment plant in Olympia.

VULNERABILITY

Thurston County has a history of landslides and their numbers seem to be increasing, suggesting a high probability of occurrence. Landslides tend to occur in isolated, sparsely developed areas, suggesting low vulnerability. Because of the high probability of occurrence and the trend to more frequent landslides a moderate risk rating is assigned.

<table>
<thead>
<tr>
<th>Probability of Occurrence</th>
<th>Vulnerability</th>
<th>Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>Low</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

Delineation of Landslide Hazard Area

For the Hazards Mitigation Plan, a landslide hazard area is defined as those parcels in the county on which slopes of 40 percent or more occur. The majority of these areas are in unpopulated areas to the south and to the west. Steep bluffs are also present in the Nisqually Valley, Olympia, Tumwater and Lacey.

Population and Employment in the Hazard Area

Presently, approximately 12,600 residents (4.7%) live in areas with 40 percent slopes or steeper. By 2040, the number of residents is forecast to reach 18,800 residents. Presently, approximately 6,500 employees (4.9%) work within the hazard area.

Residential Dwellings in the Hazard Area

Nearly 5,400 or 4.7% of residences are located in areas with steep slopes.

Inventory of Assets and Dollar Value in the Hazard Area

Countywide, an estimated $861 million in assets is located within the landslide hazard area.
WILDLAND FIRE

HAZARD DESCRIPTION

Wildland fires are uncontrolled fires in grasslands, brush, woodlands, or forests. Most are caused by human error. Wildland fires destroy valuable resource lands, wildlife habitat, powerlines, pipelines, communications, and transportation infrastructure. The impact of a major fire would be amplified by subsequent effects of landslides and flooding during heavy rains.

Wildland fires also pose threats to people, pets, and livestock in areas that intermingle with wildland vegetation. This area is termed the Wildland-Urban Interface (WUI).

Historical Occurrences and Impacts

Over 2,700 wildfires have been documented in Thurston County since 1972; an average of 63 fires per year. The average fire burns about one acre. The largest wildfire recorded in Thurston County burned approximately 140 acres near Offutt Lake north of Tenino in 1998. The map below shows the size and locations of local wildland fires.

Wildland Fires 1972 - 2015

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Acres</th>
<th>Peak Fire Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1972</td>
<td>138</td>
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<tr>
<td>1973</td>
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<td>2014</td>
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<td>0</td>
</tr>
<tr>
<td>2015</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Three areas of the county are a special concern for wildland fire due to the prevalence of fuels, human activities, and limited road access:

1. Capital Forest
2. Joint Base Lewis McChord
3. Commercial forests in southeast Thurston County

Virtually all open spaces within the county are vulnerable to a wildfire, especially those areas surrounded by brush and grass which are quick to ignite during the drier and hotter months.

VULNERABILITY

Wildland fires have a high probability of occurrence in Thurston County. The county’s combination of large forest and grassland areas, its growing population, and increasing recreational activities in open spaces result in a moderate vulnerability. Accordingly, a moderate risk rating is assigned. The effects of climate change are likely to alter Thurston County’s risk for wildland fires as longer, warmer, and drier summers are expected for the Puget Sound Region by mid-century.

<table>
<thead>
<tr>
<th>Probability of Occurrence</th>
<th>Vulnerability</th>
<th>Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>Low</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

For further information or to view the current “Hazards Mitigation Plan for the Thurston Region,” visit www.trpc.org/hazards.

Appendix A: Public Participation and Outreach Materials
VOLCANIC LAHAR

HAZARD DESCRIPTION

A lahar is a debris flow that originates from the slopes of a volcano and can surge tens or even hundreds of miles downstream. A lahar is one of Mount Rainier’s most destructive hazards. Historic evidence reveals Rainier Lahars buried large swaths of lowlands as far as the Puget Sound. Lahars can occur without a large volcanic eruption. Lahars are commonly initiated by:

- Large landslides of water-saturated debris
- Heavy rainfall eroding volcanic deposits
- Sudden melting of snow and ice near a volcanic vent by radiant heat or on the flanks of a volcano by pyroclastic flows
- Breakout of water from glaciers, crater lakes, or from lakes dammed by volcanic eruptions

Historical Occurrences and Impacts

Historically, lahars originating from Mount Rainier have been a fairly common occurrence; they vary in size and magnitude and are fairly unpredictable. Past Cascade lahars surged nearly 45 to 50 miles per hour at steepest slopes and were 100 feet or more thick. Scientists have identified more than 60 lahars that have originated from Mount Rainier in the past 10,000 years.

Under the worst-case scenario, a lahar from Mount Rainier could pose a local threat by inundating the Nisqually Valley. The potential destruction of Alder and LaGrande dams would add significantly to the destructive impact of the debris flows. A more likely potential is the displacement of water in the Alder reservoir, with potential flooding effects in the Nisqually Valley. There is evidence (dated to have occurred approximately 300 years ago) that lahars have buried forests near what are now the City of Yelm and the Nisqually Indian Reservation.

Lahars are confined to valley bottoms, so people can avoid them by seeking high ground given sufficient warning. The following major bridges/routes are located within the Case 1 inundation zone and could be adversely impacted or destroyed: State Route 507 Bridge between Yelm and McKenna, Old Pacific Highway, and Interstate 5 in the Nisqually Valley. There are also three railroad bridge crossings at risk.

VULNERABILITY

Because Mt. Rainier has been quiet for the past 1,000 years with no indication of change, this hazard has a low probability of occurrence. Nearly 900 properties could be damaged or destroyed by a Case 1 lahar. The combination of these impacts suggests that the region is highly vulnerable. Because a Case 1 lahar has a low probability of occurrence, the overall Case 1 lahar is assigned a moderate risk.

<table>
<thead>
<tr>
<th>Probability of Occurrence</th>
<th>Vulnerability</th>
<th>Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>High</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

Delineation of Lahar Hazard Area

A Case 1 lahar originating from Mount Rainier is considered by scientists to be the most appropriate scenario for hazard mitigation planning. Case 1 lahars could be high in consequence and pose a major hazard to human life and property in the Nisqually River valley should the Alder and LaGrande dams fail. The Case 1 Lahar inundation area for Thurston County is shown on the map to the right.

Based on the Case 1 lahar scenario, properties along the Nisqually River Valley are the most susceptible to lahar inundation.

Population and Employment in the Hazard Area

Presently, nearly 2,000 residents (0.7%) and 600 employees (0.4%) live and work in the Case 1 lahar hazard area.

Residential Dwellings in the Hazard Area

Approximately 900 or 0.8% of the county’s residential dwelling units are located in the lahar hazard area. By 2040, the number of dwelling units in the hazard area could increase to 1,000.

Inventory of Assets and Dollar Value in the Hazard Area

Nearly $59 million in residential, $5 million in commercial/industrial, and $6 million in government/institutional estimated property valuation is within areas at moderate to high risk.

For further information or to view the current “Hazards Mitigation Plan for the Thurston Region,” visit www.trpc.org/hazards.
OTHER HAZARDS

Other Hazards
Thurston County is subject to a variety of both natural and human-caused hazards. The following threats may impact the region, but are not profiled in detail in the Hazards Mitigation Plan.

Critical Shortage
Critical shortages are the lack or reduction of essential goods or services due to a disruption in their supply. They are caused by events that occur elsewhere. These events could include embargoes, strikes, natural disasters, epidemics, crop failures, over exploitation of a natural resource, terrorist activities and political unrest. A fuel shortage would have a major impact to the region’s economy.

Cyber-attack
A cyber-attack is an offensive maneuver against individuals or organizations that targets computer information systems, infrastructure, networks, or personal devices. The attacks attempt to disable operations, steal information, or hold systems ransom. They may be launched by nation states, criminal organizations, or hackers acting with malicious intent. Local government information such as signal controllers, water systems, and other utilities that are controlled remotely by computers may be at risk.

Dam Failure
There are 38 dams in or adjacent to Thurston County. There are three dams classified as high hazard dams in the county, Alder and LaGrande Dams on the Nisqually River and the Skookumchuck Dam on the Skookumchuck River. The Dam Safety Office of the Washington State Department of Ecology rates each dam’s downstream hazard classification. This classification provides a simple characterization of the downstream setting to reflect the general nature of consequences if the dam were to fail and release the reservoir into affected areas.

**Downstream Hazard Classification of Thurston County Dams**

<table>
<thead>
<tr>
<th>Dam</th>
<th>Classification</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alder and Skookumchuck</td>
<td>1A</td>
<td>High – Greater than 300 lives at risk</td>
</tr>
<tr>
<td>LaGrande</td>
<td>1B</td>
<td>High – From 31 to 300 lives at risk</td>
</tr>
<tr>
<td>All others</td>
<td>1</td>
<td>Low – No lives at risk</td>
</tr>
</tbody>
</table>

Dam failures can be caused by flooding or an earthquake, but most are caused by human error such as poor construction, operation, maintenance, or repair. The effects of a dam failure vary by dam, the amount of water stored behind it, stream flow conditions, and the size and proximity of the population downstream. Major dam failure may result in loss of life, destruction of homes and property, damage to roads, bridges, powerlines, and other infrastructure, loss of power generation and flood control capabilities, disruption of fish stock and spawning beds, and the erosion of stream and river banks. The Thurston County Hazard Inventory and Vulnerability Analysis report has assigned a low risk rating for dam failure.

Drought
Drought is a condition of climatic dryness that is severe enough to reduce soil moisture levels and water levels below the minimum necessary for sustaining plant, animal, and human life systems. Thurston County experienced drought conditions in 2015. While there were no major losses during this period, there were reports of some residential wells drying up and countless young trees died. Climate change projects for the Puget Sound Region indicate that longer, warmer, and drier summers will become more the norm by mid-century. Drought can destroy or lower crop yields, impact fish habitat, and increase risk for wildland fires.

Epidemic
Epidemics are outbreaks of disease that may affect a significant portion of a population in a relatively short period of time. Although usually referring to a human contagious disease, epidemics can also affect domestic and wild animals as well as crops. Epidemic diseases are usually introduced into an area from remote regions and inflict devastation because there is not natural or induced immunity.

Hazardous Material Incident
Hazardous materials include chemicals used in manufacturing, household chemicals, crude oil and petroleum products, pesticides, herbicides, fertilizers, paints, medical wastes, radioactive materials and a host of other substances. Their manufacture, transport, storage, use, and disposal place public property and the environment at risk from their inadvertent or intentional release. Local communities have little to no knowledge of when and what type of hazardous materials are being transported by highways or railroads through Thurston County.

Space Weather/Solar Wind/Geomagnetic Storm
The behavior and energy output of our nearest star, the Sun, varies according to a cycle that lasts around 11 years. A coronal mass ejection or other solar phenomena can release magnetic storms from the Sun that can severely disrupt and damage electrical distribution systems and devices on Earth. In March 1989, transformers at power stations in Canada were affected by a current surge that was induced by the changing magnetic fields at ground level. The surge led to power blackouts throughout Quebec that lasted for several hours, and the power company lost more than 21,500 megawatts of its production capacity. In addition, a transformer at a nuclear-power plant in New Jersey was damaged beyond repair as a result of the induced current.

Terrorist Attack
Terrorism is the force or violence against persons or property violating the criminal laws of the United States for purposes of intimidation, coercion, or ransom. Terrorists often use threats to create fear among the public; try to convince citizens that their government is powerless to prevent terrorism; and try to get publicity for causes. Bombings and mass shootings are the most frequently used terrorist method in the United States. Other possibilities include attacks upon transportation facilities, utilities, or other public services, or an incident involving chemical or biological agents.

Tsunami
A tsunami is a sea wave of extremely long length generated by a seismic disturbance (earthquake, volcanic eruption or debris slide) below or on the ocean floor. Wave lengths may exceed sixty miles and travel 300-600 mph. They can be of local origin or originate from distant origins such as Alaska or Japan. Tsunamis are incredibly destructive. It is unlikely that Thurston County would be directly impacted by such a tsunami. The wave energy would be depleted by the time it reaches the South Sound. However the county could be indirectly affected by tsunami impacts to communities on the coast.

Heat Wave
A heat wave is characterized by five or more consecutive days of unusually hot weather. Locally, the National Weather Service considers hot weather to be 90 degrees or higher. Prolonged periods of extreme temperatures can result in heat injuries or dehydration for the young, elderly, and people who work outdoors.
VISION, GOALS AND OBJECTIVES

Vision: All sectors of the community work together to create a disaster resilient region.

Mitigation Goals and Objectives

The plan’s goals are the overarching principles that communities will base their mitigation decision-making upon. The objectives define actions or results that can be placed into measurable terms, and translated into specific assignments for implementation. Each objective fulfills an important role and is integral to the creation of more disaster resilient communities. The goals and objectives listed below are not prioritized and should be fulfilled concurrently.

1. Protect life
   A. Design, build, operate, and maintain disaster resistant communication systems that provide emergency notifications and instructions.
   B. Decrease the impacts of hazards on at risk individuals or special needs populations.
   C. Address emergency evacuation needs, prioritizing areas of the community where mitigation strategies are ineffective or cost prohibitive.
   D. Train and equip emergency service providers to effectively respond to hazard events.

2. Protect Infrastructure
   A. Maintain and upgrade roads, bridges, and other transportation infrastructure and services to withstand the effects of hazards without prolonged disruptions to their operation.
   B. Maintain and upgrade utility systems and services to withstand the effects of hazards.
   C. Maintain or replace public buildings such as offices, schools, and other facilities to withstand the effects of hazards.

3. Protect property
   A. Minimize the number of properties that are situated in hazard prone locations.
   B. Protect and preserve vital records, data, information technology systems, and facility contents.
   C. Safeguard objects or places that have cultural or historic significance.

4. Protect the environment
   A. When possible, use mitigation strategies that preserve ecological functions of natural systems.
   B. Consider mitigation actions that restore natural systems that provide protective measures to surrounding properties.
   C. Evaluate the effectiveness of existing Critical Areas Ordinances and development regulations and revise them as necessary to ensure development does not occur in areas prone to hazards or changing environmental conditions that threaten public safety.
   D. Support efforts to increase local jurisdictions’ abilities to appropriately respond to hazardous material releases.

5. Sustain the economy
   A. Develop and maintain efforts to prepare recovery plans.
   B. Focus on mitigation strategies that protect medical treatment centers, employment centers, commercial districts, and schools.
   C. Coordinate with regional, state, and federal agencies to identify and prioritize continuity of operations on lifeline transportation corridors and systems.
   D. Strengthen public-private partnerships to reinforce or establish redundancy for critical supply systems.
   E. Develop and maintain continuity of operations plans for essential public safety services.

6. Build community support
   A. Coordinate and provide leadership in the hazard mitigation planning process among local, tribal, state, and federal government entities.
   B. Engage residents, businesses, employers, medical centers, utility companies, subject matter experts, community, and faith-based organizations as partners to help identify opportunities to strengthen the region's hazard resilience.
   C. Update the region’s Hazards Mitigation Plan every five years, or sooner if necessary to respond to emerging threats.

7. Expand understanding of hazards
   A. Monitor and evaluate precipitation, groundwater, stream flow levels, and survey flood high water marks.
   B. Partner with state and federal agencies, colleges, universities, and non-governmental organizations to participate in modeling programs to map high risk hazard areas.
   C. Participate in regional or state wide disaster scenario exercises to assess mitigation, preparedness, response, and recovery capacities and apply lessons learned to mitigation activities.
   D. Develop a better understanding of the location and mitigation needs of vulnerable and special needs populations within the communities.

8. Implement effective mitigation strategies
   A. Focus mitigation efforts on the region’s greatest risks and vulnerabilities.
   B. Integrate adopted mitigation strategies into other planning documents such as response plans, comprehensive plans, strategic plans, Critical Areas Ordinances, Capital Facility Plans, zoning codes, and development regulations.
   C. Apply for federal mitigation assistance grants and leverage other funding sources to finance mitigation projects.

9. Increase public awareness
   A. Develop and sustain ongoing communication campaigns with residents, customers, businesses, and other stakeholders about the known risks of hazard events and the actions that community members or organizations can take to prevent or minimize losses.
   B. Conduct broad outreach activities to engage all sectors of the community in the hazards mitigation planning process.

For further information or to view the current “Hazards Mitigation Plan for the Thurston Region,” visit www.trpc.org/hazards.
**COUNTYWIDE MITIGATION INITIATIVES**

<table>
<thead>
<tr>
<th>Priority</th>
<th>ID-Number</th>
<th>Category</th>
<th>Countywide Mitigation Initiatives</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>CW-MH 4</td>
<td>Hazard Damage Reduction</td>
<td>Create a traffic transportation route GIS map for the Thurston region and integrate the data into the Thurston County Emergency Operations Plan and other local planning needs.</td>
</tr>
<tr>
<td>2</td>
<td>CW-MH 7</td>
<td>Hazard Preparedness</td>
<td>Develop interjurisdictional capabilities - to share critical resources during emergencies and natural disaster events.</td>
</tr>
<tr>
<td>3</td>
<td>CW-MH 6</td>
<td>Public Information</td>
<td>Develop a public information and outreach website, complementary printed materials, use social media, and convene community events to increase the awareness and participation in hazard mitigation for...</td>
</tr>
<tr>
<td>4</td>
<td>CS-FH 1</td>
<td>Data Collection and Mapping</td>
<td>Develop emergency evacuation routes, and update affected agencies comprehensive Emergency Management Plans for areas affected by potential catastrophic dam failure.</td>
</tr>
<tr>
<td>5</td>
<td>CW-SH 1</td>
<td>Hazard Preparedness</td>
<td>Improve the capabilities of disaster debris management.</td>
</tr>
<tr>
<td>6</td>
<td>CW-WH 1</td>
<td>Data Collection and Mapping</td>
<td>Map the region’s high risk wildland urban interface communities.</td>
</tr>
<tr>
<td>7</td>
<td>CS-MH 1</td>
<td>Data Collection and Mapping</td>
<td>Continue to refine the list of the region’s critical facilities and jurisdictional asset data and develop database to support hazard mitigation planning and emergency management.</td>
</tr>
<tr>
<td>8</td>
<td>CW-EH 2</td>
<td>Data Collection and Mapping</td>
<td>Improve the technical analysis of earthquake hazards in the county and integrate modeling capacity into emergency management work programs.</td>
</tr>
<tr>
<td>9</td>
<td>CW-MH 11</td>
<td>Data Collection and Mapping</td>
<td>Sheltering Facilities Assessment.</td>
</tr>
<tr>
<td>10</td>
<td>CW-MH 9</td>
<td>Data Collection and Mapping</td>
<td>Map transportation infrastructure that is subject to frequent flooding or is prone to landslide hazards.</td>
</tr>
<tr>
<td>11</td>
<td>CW-MH 10</td>
<td>Plan &amp; Coordination Implementation</td>
<td>Develop and adopt a Climate Adaptation Plan.</td>
</tr>
<tr>
<td>12</td>
<td>CW-MH 8</td>
<td>Hazard Preparedness</td>
<td>Strengthen the capabilities of the Disaster Medical Coordination Center (DMCC) Hospital.</td>
</tr>
</tbody>
</table>

**Mitigation Categories**

Each mitigation initiative falls into one of seven categories described below.

1. **Public Information**: Information available in a variety of formats to inform community members, elected officials, property owners, and businesses about hazards and opportunities to mitigate them.

2. **Plan Coordination and Implementation**: Activities that support a jurisdiction’s mitigation planning process and implementation strategy, internally and externally.

3. **Data Collection and Mapping**: Actions related to gathering and analyzing new data to improve decision making.

4. **Development Regulations**: Government administrative or regulatory actions to influence the way land is developed and buildings are constructed to protect people, property, and the environment.

5. **Hazard Preparedness**: Actions that protect people and property during and immediately after a disaster or hazard event.

6. **Hazard Damage Reduction**: Actions that involve the modification of existing buildings or structures to protect them from a hazard or remove or relocate them outside of the hazard area.

7. **Critical Facilities Replacement/Retrofit**: Refers specifically to hazard damage reduction activities targeted specifically at protecting or replacing critical facilities.

**Countywide Mitigation Initiatives**

There are 12 draft mitigation initiatives that reduce hazard risks countywide. Multiple stakeholders will be responsible for overseeing their implementation. The draft countywide initiatives are shown in order of priority in the table to the right.

**Jurisdiction Initiatives**

Each jurisdiction identifies actions that are specific to their community. The implementation of these activities will be the responsibility of the jurisdiction that adopts them. These actions are listed in each participating jurisdiction’s annex to the Hazards Mitigation Plan.
Thurston Region Hazards Mitigation Plan Update Comment Form

Please use this form to share your comments on the Hazard Mitigation Plan topics below.

Hazard Identification and Risk Assessment:

_______________________________________________________________________________________
_______________________________________________________________________________________
_______________________________________________________________________________________
_______________________________________________________________________________________
_______________________________________________________________________________________

Mitigation Strategy (Goals, Objectives, and Initiatives):

_______________________________________________________________________________________
_______________________________________________________________________________________
_______________________________________________________________________________________
_______________________________________________________________________________________
_______________________________________________________________________________________

Other Topics:

_______________________________________________________________________________________
_______________________________________________________________________________________
_______________________________________________________________________________________
_______________________________________________________________________________________
_______________________________________________________________________________________

Your Name: ____________________________________________________________________
Organization or Affiliation: ___________________________________________________

For questions or comments about the Thurston Region Hazards Mitigation Plan, please contact:
Paul Brewster, Thurston Regional Planning Council, 360-741-2526 or brewstp@trpc.org.
The entire draft Hazard Mitigation Plan will become available online at www.trpc.org/hazards.
Open House Meeting Feedback and Evaluation

HAZARDS MITIGATION PLAN
OPEN HOUSE

Thank you for attending today’s meeting. Your feedback is important. Please take a moment to complete this questionnaire. Your responses will remain confidential.

1. Where do you live?
   - [ ] Bucoda
   - [ ] Lacey
   - [ ] Olympia
   - [ ] Rainier
   - [ ] Tumwater
   - [ ] Tenino
   - [ ] Yelm
   - [ ] Thurston County (outside of city limits)
   - [ ] Nisqually Indian Reservation
   - [ ] Confederated Tribes of the Chehalis Reservation
   - [ ] Other____________________

2. How did you find out about today’s meeting?
   - [ ] Email
   - [ ] Facebook/Twitter
   - [ ] TRPC Website
   - [ ] Newspaper
   - [ ] Friend/Neighbor/Co-Worker
   - [ ] Other____________________

3. Why did you attend the Open House?
   __________________________________________________________
   __________________________________________________________
   __________________________________________________________

4. Would you agree that you had adequate opportunity to participate today?
   
<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly disagree</th>
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<tbody>
<tr>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
</tbody>
</table>

5. Of the information presented at the open house, which did you find most useful?
   ______________________________________________________________________

6. Of the information presented at the open house, which did you find least useful?
   ______________________________________________________________________

7. Would you say the amount of time available to review the information at the meeting was:
   
<table>
<thead>
<tr>
<th>Too long</th>
<th>Just right</th>
<th>Not enough</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
</tbody>
</table>

8. Is there anything else you want to comment on about today’s meeting?
   __________________________________________________________
   __________________________________________________________
   __________________________________________________________

Thank you for sharing your responses with us.

Thurston Regional Planning Council. www.trpc.org/hazards
Appendix A: Public Participation and Outreach Materials

A-22: Project Website

HAZARDS MITIGATION PLAN
PUBLIC COMMENT

MARCH 22 - APRIL 5

Hazards Persist, But Disasters Can Be Avoided

The 3rd Edition of the Hazards Mitigation Plan for the Thurston Region results from a multi-jurisdictional process to develop a mitigation strategy to reduce the risks of the most destructive hazards that threaten the region. The plan specifically addresses communities and local governments within Thurston County.

Earthquakes, landslides, severe storms, floods, volcanic eruptions, and other less common hazards can cause lengthy disruptions and are costly to communities, the state, and the federal government. Hazard mitigation breaks the disaster cycle by identifying and implementing sustained actions that eliminate long-term risks to life and property.

TRPC Seeks Comments on Draft plan

The Draft Hazards Mitigation Plan for the Thurston Region is available for review. The plan partners invite you to provide feedback on the plan’s contents. The deadline for comments is Wednesday, April 5, at 5:00 p.m. PST. Be sure to include your own name and address on all correspondence.

3 Ways to Comment:
- Submit comments using the survey form
- Email comments to brewster@trpc.org
- Mail comments to:
  Paul Brewster
  Thurston Regional Planning Council, Suite A
  2424 Heritage Court SW
  Olympia, WA 98502

Plan Downloads

Contact Us

Paul Brewster
Senior Planner
brewster@trpc.org
360-744-2525

Thurston Regional Planning Council
2424 Heritage Court SW
Suite A
Olympia, WA 98502
360-956-7575

What's the difference between preparedness, response, and mitigation?

Using flood as an example...

Preparedness: activities such as planning or staging of supplies or personnel in anticipation of an emergency.
Response: involves rescue training, maintaining equipment, and procuring supplies — knowing that response efforts will be necessary in the future.

Mitigation: actions that reduce the demand for preparedness and response activities by eliminating the impacts of the identified hazards.
Local officials outline ways to minimize impacts of earthquakes and other hazards

Earthquakes, floods and ice storms are hazards that can’t be stopped.

But with the right planning, those events don’t have to cripple communities and turn into disasters, local emergency management officials say.

A new, nearly 400-page document outlines the top emergency hazards and how local officials plan to minimize their damage.

The Hazards Mitigation Plan for the Thurston Region was prepared by the Thurston Regional Planning Council, and is under review for public comment through Wednesday afternoon. A work group of nearly 30 emergency response representatives from Thurston County’s cities and towns, tribes, school districts, fire districts and other groups worked for the past two years to develop the plan.

Local governments also worked together on hazards mitigation plans in 2003 and 2009.

“Our first two plans were somewhat more response and preparedness orientated,” said Paul Brewster, a senior planner with Thurston Regional Planning Council, which represents 21 jurisdictions and organizations in the area. “The whole point of mitigation is to prevent the disaster from occurring in the first place, and minimizing the impact.”

Thurston County has the fifth-highest rate of federal disaster declarations in the state. Between 1965 and 2016, the county received 22 federal declarations, including ones tied to a 6.7 magnitude earthquake that rocked the Puget Sound region on April 29, 1965, the eruption of Mount St. Helens on May 18, 1980, and the 6.8 magnitude Nisqually Earthquake on Feb. 28, 2001.

The most recent declaration was in 2012 when a winter storm buried Thurston County in a foot of snow and ice.

In 2014, Thurston County was awarded nearly $60,000 in grants to update the hazards mitigation plan, and that amount was matched by the county in staff time and resources, according to Brewster.
The plan is designed to keep South Sound communities from having to issue future federal disaster declarations, which are used to free up money for recovery efforts, according to Andrew Kinney, emergency management coordinator for Thurston County. The plan defines mitigation as actions that reduce the demand for preparedness and response activities, such as elevating or removing structures in areas that are prone to flooding or regulating future development in those areas.

“The whole point of the plan is to break that disaster cycle,” Brewster said.

Many activities in the plan continue efforts outlined in previous editions, such as a remapping of flood plains for all rivers, streams and high groundwater areas in the region.

Two new activities proposed in the plan are designed to help prevent potential harm after an event. They include training county engineers to conduct seismic evaluations for bridges after an earthquake to determine safety levels and developing a plan to address medical needs of people who rely on electricity-powered medical equipment, such as motorized scooters and dialysis machines.

Each participating municipality or district that participated created their own annex, or local plan, and “should be conducting their own public outreach process on their initiatives before they adopt it,” Brewster said.

The regional plan covers work that will be done over the next five years to protect lives, infrastructure, property and the environment during future hazards. It mixes history with the latest science and technology to identify hazard areas and predict potential impacts.

People can view the plan at www.trpc.org.

One of the outcomes of a past mitigation plan is AlertSense, a new community notification system, Kinney said. People can subscribe to the system to get emergency alerts on river flooding, extreme storms and other hazards. Officials can also use the system to send notifications to mobile devices in certain areas of the county, even if they don’t subscribe to the system.

But there’s much more work that can be done to improve communications during a disaster, Kinney said.

“There are still pockets in the county that you can only reach by landline,” he said.

In addition, the hazards mitigation plan is only one portion of keeping disaster at bay, Kinney said. Emergency preparedness also saves lives when hazards strike, he said.

Lisa Pemberton: 360-754-5433, @Lisa_Pemberton

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PROVIDE INPUT

Community members are invited to review and provide feedback on the most recent edition of the Hazards Mitigation Plan for The Thurston Region through 5 p.m. Wednesday. View the plan at www.trpc.org.
A-24: Legal Notice for Draft Plan

NOTICE OF PUBLIC REVIEW AND COMMENT ON
DRAFT HAZARDS MITIGATION PLAN FOR
THE THURSTON REGION

NOTICE IS HEREBY GIVEN THAT in accordance with the Code of Federal Regulations 44 Part 201.6 and the Disaster Mitigation Act, Thurston Regional Planning Council invites all interested stakeholders to review and comment on the Draft Hazards Mitigation Plan for the Thurston Region. This plan was prepared through the cooperative effort of local governments in Thurston County. The plan contains proposals to mitigate the effects of natural hazards.

The public review and comment period ends at 5:00 p.m. on April 5, 2017. The plan is available online at www.trpc.org/hazards.

Please submit all comments in writing to Thurston Regional Planning Council, 2424 Heritage Court SW, Suite A, Olympia, WA 98502. Be sure to include your name and address on all correspondence.

For more information contact Paul Brewster at brewstp@trpc.org or (360) 741-2526.

If you need special accommodations to participate in this process, please call us at 360-956-7575 by 5:00 p.m. Ask for the ADA Coordinator. For TDD users, please use the state’s toll-free relay service, (800) 833-6388, and ask the operator to dial 360-956-7575.

Arrangements can be made to review and comment in other languages.

THURSTON REGIONAL PLANNING COUNCIL

Publish: March 29, 2017
A-25: Public Comments

Public Comments Received March 22 to April 5, 2017

March 23, 2017, Pete Kmet

Overall, great job on this plan. I have only a few minor comments.

Page 2.0-22, Priority 10 or 12. Recommend this be expanded to assess the earthquake vulnerability of bridges.

I’m not sure where to add this, but I also think we should consider assessing critical components of our water and sewer infrastructure systems for potential earthquake damage and whether relocation or upgrades are necessary. For example, water storage tanks and water supply pumping facilities, key sewerage lift stations and mains (I’m assuming LOTT has assessed its facilities). These assessments could be done as our water and sewer plans are updated. This be a qualitative analysis, at least initially, to keep costs down.

I continue to remain concerned that we have significant power outages whenever we have a modest storm event and typically at least one major power outage every storm season. I realize there are UTC limitations on PSE paying for undergrounding but these outages are not only inconvenient, they affect our commerce and could be critical should an earthquake coincide with these events. At a minimum, we should ask PSE to provide us with information to map locations where powerlines have been severed and the cause of these breaks. Where there are segments with frequent breaks, we should ask the UTC to direct them to develop a plan to address these problem segments.

Page 3.0-21. I’m not sure the purpose of this list but if you want to be complete, there are also Lake Management Districts. For example, in Tumwater, we have the Barnes Lake Mgt. District.

Page 3.1-2. 2nd paragraph. In 2016, Tumwater has also updated our flood control ordinance and adopted the new maps for the Deschutes River.

Page 3.1-9. The Oregon Spotted frog is also a listed species for our area. There are several others as well in our area but the ones identified (plus the frog) are probably the most relevant ones. As far as I know, only Tumwater (in partnership with the Port) and Thurston County are currently preparing HCPs, not “all affected jurisdictions”. Tumwater has also updated our flood ordinance to reflect changes required by the federal government to address certain endangered fish species.

Page 3.1-16. Tumwater has updated our Comprehensive Plan and it has been accepted by Commerce. While I think there is one more administrative step in the adoption process, we should be done by the time this plan is finalized.

Page 3.1-18. It might be helpful to list the status of the WRIA plans here. My understanding is that the Deschutes WRIA plan has never been brought to a conclusion, for example. I’m not sure of the status of the other WRIA plans. It’s misleading to list them as if these are ongoing.

Chapters 4.0 through 4.6. These Chapters represent a significant amount of work and I appreciate the effort here. Recognizing that the City boundaries are a moving target as we annex areas, and would be a major effort to update the work here, I recommend you add a note to all tables and maps indicating what date these represent. You may also want to add a statement to the Chapter 4.0 that the facility numbers and estimates of damage are planning level estimates, as one could get the impression these values are more precise than they really are.

Chapter 4.1. See my comments above about earthquake vulnerability.

Chapter 4.5. Should probably state here somewhere that Lacey, Olympia and Tumwater (effective 2018) have banned personal fireworks, helping reduce that risk.
March 24, 2017, E.J. (Ed) Pole II

Forcing someone to download multiple small PDF files to review the plan is extremely inconvenient. There should be a link to download the entire plan in one scannable PDF file. It is almost as if you really don’t want comments.

March 25, 2017, Michelle Underwood

[Page] 4.3-13

Replace Department of General Administration with Department of Enterprise Services.

Thank you

March 26, 2017, Paul Froehlich

Given the housing situation in Thurston County, many of us have no choice but to live in neighborhoods with Homeowners Associations. Many HOAs have highly restrictive covenants on antennae which amateur radio operators could use to help with communication after a disaster. Local government could encourage HOAs to allow amateur radio antennae, as well as rain barrels and solar panels (dare I add “Victory Gardens” with backyard chickens?).

March 27, 2017, Michelle Zenner

I’m not finished reading the entire plan. I hope I’m not limited to “one comment”.

Tacoma Power has not been taken to task for dam EAP - Emergency Action Plan with regards to dam release or flooding & #CascadiaEQ.

Chapter 4.4-6 First paragraph, line 3 - date discrepancy should be 2014 regarding #OsoSlide, but the following page had the correct year in heading.

Tacoma Power’s peers (if that can be said of PGE) have “at least” provided disaster preparedness links. Although, Red Cross, isn’t my first pick for a disaster preparedness link. Tisk tisk #TacomaPower Who is responsible for getting the EAP? FERC Federal Energy Regulatory Commission or WA AGO with WA RCW creation that specifies privately owned dams in WA state must provide EAP? How about the Governor’s new commission on resiliency? Good Luck.

April 2, 2017, David Knoblach

I like the idea of the mitigation plan very much. I apologize that these quick notes are not well written. But here are some ideas and quick comments about improving the presentation of the mitigation plan. 4.1-1: The stated fact of 5300 historic earthquakes in Thurston county does not apply as useful information because nearly all of these were not felt and caused no damage. No one can feel a 2.0 magnitude earthquake and few people can feel a 4.0 earthquake. Damage here generally is relatively minimal until the earthquake magnitude approaches the 6.0 range (unless it is a shallow quake). The New Yorker article was great for increasing awareness, but had significant flaws stating everything west of I-5 would be “scraped off the map” in a big earthquake. That statement is misleading and not true. My opinion it is best to inform people without providing unnecessary exaggeration or including information that doesn’t apply, or is too technical to be useful--like I noted in the above examples.

4.1-2: again the earthquake map shown is hard for most people to interpret since most earthquakes plotted are nonevents that were not even felt by people. There is too little information there to help people interpret the meaning of the map.
4.1-3: strike-slip, reverse, and thrust fault terms are not defined well in the publication and is not needed for the public. These terms are too complex and most people are fine with just “earthquakes” or simple terms like “deep” or “shallow” earthquakes, without confusing them with jargon terminology.

4.1-4: the attempt to explain magnitude is important but I think this is too complex and nebulous for most people. You should couple general damage on the Richter scale with general examples from the Mercalli scale. Example: magnitude 4 and below = generally not felt and no damage and no injuries. Magnitude 5 felt by everyone but generally no severe damage or many significant injuries. Magnitude 6: potential significant damage to localities containing buildings with poor construction, unstable slopes, unstable subsurface sediment, and with localized injuries and has potentials of death in some areas to dozens of people. Plus similar information for stronger quakes.

4.1-5: ground accelerations maybe a bit too complicated on the first half of the description but the second half is more useful and meaningful to understand.

4.1-6: good map but more interpretation is needed. Should include information that localities with unstable slopes and soft lowland areas along beaches, valley bottoms may receive significantly more severe shaking than nearby areas of known hard-packed soils from glacial times.

4.1-7: informative page, perhaps should be integrated more directly with previous Richter scale information covered earlier.

4.1-8 to 4.1-12: the technical names for the different types of earthquakes maybe too much here, and are poorly defined in the text. The map is good but should contain more information for people to interpret correctly. The information in the following pages has some excellent information but also gets too technical in some places with jargon. Most people just want to know what can happen, and too much technical information can get too confusing and overwhelming, and the key message can get lost in too much jargon and technical details. I would provide the shake maps on 4.1-8 with additional scenario maps for a subduction and shallow earthquakes and have separate explanations for each of these scenarios.

4.1-12 to 4.1-15: Listed effects of earthquakes and impacts are good--although a bit too technical in areas. The debris destruction information is interesting but not really well interpreted. People want to know how much damage, and deaths, and time to recover from such events. Even smaller earthquakes can cause potential damage to houses from loosening siding to open routes to cause future interior water damage from rain. People want to know general potentials of time disruptions for roads, the port, schools, and key services, and things that could affect them and their families. For example a strong earthquake could destroy the port and would cause loss of port business for many years. A subduction earthquake could kill 15,000 people in the entire region that includes Thurston county, but most people would survive just fine. However emphasis on personal preparation would make a big difference regarding initial recovery. Without preparation many people may have to leave the area to receive proper services of food and shelter. Two weeks of food should be emphasized. The tables that follow, on the other pages in this report, are good technical specifications for civil planning, but general statements are best for average people to understand an earthquake related to them.

Landslides: missing information of the large landslide near Salmon Beach in Tacoma that happened shortly after the 1965 earthquake. Should note tsunami potential in Puget Sound for local shallow earthquakes.
Appendix A: Public Participation and Outreach Materials

March 2017                               Hazards Mitigation Plan

Volcanoes: the Election mudflow may have been triggered by an earthquake or just started spontaneously. Little warning would happen from a similar event, compared to a lahar triggered from a volcanic eruption.

Again, I apologize about these rather hasty notes. But if there is some interest in these comments I would be glad to chat with someone on your team. I’m teach geology at SPSCC.

April 5, 2017, Bob Jacobs

Hi Paul --

This is my official comment on the draft plan. Just under the wire -- better late than never.

General Impression

This is an amazing piece of work. You and your team have compiled a much more detailed and informative report than I would have expected. And it is very readable and nearly free of typos. Congratulations to all.

My Focus

My primary interest is the risks of earthquake damage in our county, esp. the risks of subduction zone earthquakes. This is because this is by far the biggest risk we face here. And as an expert has pointed out, a single subduction zone earthquake would be more dangerous for us that all the U.S. hurricanes and tornadoes put together -- due to the large area involved and the extensive damages that will occur to vital infrastructure -- termed “lifeline systems” on page 4.1-22).

Detailed comments (not in priority order)

1. Under the goal of protecting property, (item 3.A, page 2.0-2), the plan calls for minimizing the number of properties that are situated in hazard prone locations. Unfortunately, the city of Olympia has been doing the opposite -- encouraging lots of development (residential development, at that) -- in downtown areas that are at the highest risk of liquefaction. I have to question the value of planning like this when the local governments clearly are not complying. And by the way, Tumwater’s plans for densifying the I-5/Capitol Boulevard corridor with dense housing have the same problem.

2. Public education about risks is listed as an important goal on pages 2.0-4,-5, -9, -15 and 2.0-9. I agree strongly. However, this is one area where all of the jurisdictions in the county, to my knowledge, have fallen down badly. Our local public officials seem unwilling to “tell it like it is”. When people are not prepared -- mentally as well as physically -- survival and recovery will be far worse. If the Big One happened today, there would be nearly universal shock and bewilderment among our county’s population because very few people really understand the dangers we face. It is imperative that our public officials start telling the truth on this topic, so that the public can be physically and mentally prepared. And it is also imperative that serious survival planning be started by our local governments.

3. The more I learn about subduction zone quakes -- the terrible immediate damage, the hundreds of aftershocks (some strong enough to do more damage), the inability to restore basic infrastructure for long periods), the more I am convinced that many people will want to evacuate, at least for a period. I suggest that evacuation planning be added as an alternative in the subduction zone earthquake scenario.

4. I suggest that maintenance of communications facilities for cell phones and email after a subduction zone quake be given very high priority. It will be most important for everyone to be able to share information about viable transportation routes, water supplies, food supplies, fuel supplies, medical assistance, etc. These cannot be known in advance, especially transportation routes.
5. After page 4.1-18, I strongly suggest that a section be added about recovery times. Available documents indicate that recovery of basic utilities can take up to several years. Transportation facilities can take longer. And these times could be underestimated if they do not take into account the vast area potentially destroyed -- northern California to British Columbia -- which implies both a huge job and difficulty in getting assistance from outside.

6. In the economy section, page 3.0-5, the report repeats the common misperception that increased economic diversity would make our area more resistant to recessions. That is a good general rule, but one that does not apply universally. Olympia's government-based economy is an exception, along with university towns, etc. This section of the report also suggests that we should increase local employment, which would increase our population, but not our economic stability (as explained above), nor our economic welfare. It would just increase our taxes. I suggest that this verbiage be removed from the report.

I trust that these comments will be helpful in improving an already-excellent document.

April 5, 2017, Henry Cervantes

Chapter 4, under Hazard Identification, on page 4.0-8, “Epidemic” is identified. Although FEMA does not require inclusion of bio-hazards the WA State Hazard Mitigation Plan, dated Nov 2012 includes a Hazard Profile on “Communicable Disease Outbreaks, Epidemics, Pandemics”. This is something you may want to add to the Thurston plan.

Chapter 3, under Regional Planning you may want to add the Thurston County Public Health and Social Services, the Region 3 Healthcare Preparedness Coalition, the Homeland Security Region 3, Thurston County Chamber of Commerce, Providence Saint Peter Hospital, Capital Medical Center and Group Health Olympia Medical Center as planning partners. Chapter 3, under Comprehensive Plans, you may want to add the Thurston County Hazard Identification and Vulnerability Assessment (HIVA) as a resource document.

The plan is well organized and written, and should meet FEMA’s requirements.
Appendix B

Hazards Mitigation Workgroup and Plan Partner Forms & Templates

The Hazard Mitigation Plan Workgroup and plan partners were supplied a variety of forms and tools to evaluate their mitigation strategy and compose their annex. Appendix B includes samples of these materials.

- B-1: Hazard Problem Statement Form
- B-2: Mitigation Evaluation (Benefit/Cost Review) Form
- B-3: Mitigation Initiative Template Instructions
- B-4: Mitigation Initiative Template
- B-5: Countywide Mitigation Initiatives Prioritization Survey
B-1: Hazard Problem Statement Form

Thurston Hazards Mitigation Plan Problem Statement and Alternative Mitigation Actions Worksheet

1. Define the problem (the effect of a particular hazard on the community)

Example: In wildland-urban interface areas, two critical facilities (a school and a county maintenance shop) and $500 million in property value are at risk, and there is increasing development pressure.

2. Identify 2-3 possible actions (mitigation initiatives) to overcome the problem

Examples:
   a. Adopt a wildfire mitigation code
   b. Retrofit school and maintenance shop with fire-resistant materials
   c. Implement a Firewise Program to educate property owners

Alternative 1:

Alternative 2:

Alternative 3:
## B-2: Mitigation Evaluation (Benefit/Cost Review) Form

<table>
<thead>
<tr>
<th>Hazard Being Addressed</th>
<th>Hazard Mitigation Plan</th>
<th>Hazard Preplaredness</th>
<th>Hazard Damage Reduction</th>
<th>Critical Facilities Replacement/ Retrofit</th>
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<td>Example: Implement a Firewise Program</td>
<td>Life Safety Protection</td>
<td>Technical and Information</td>
<td>Social and Community Objectives</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Property Protection</td>
<td>Political and Social</td>
<td>Environmental Protection</td>
</tr>
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<td></td>
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<td>Legal Protection</td>
<td>Administrative</td>
<td>Local Champion</td>
</tr>
<tr>
<td>Hazard Mitigation Plan Evaluation</td>
<td>Example: Implement a Firewise Program</td>
<td>Life Safety Protection</td>
<td>Technical and Information</td>
<td>Social and Community Objectives</td>
</tr>
<tr>
<td>Hazard Preplaredness</td>
<td>Example: Implement a Firewise Program</td>
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<td>Example: Implement a Firewise Program</td>
<td>Life Safety Protection</td>
<td>Technical and Information</td>
<td>Social and Community Objectives</td>
</tr>
</tbody>
</table>

### Scoring Criteria

- 2: Great benefits, highly effective or high chance of implementation
- 1: Moderate benefits, effective or good chance of implementation
- 0: Not applicable or neutral
- -1: Not effective or challenging to implement
- -2: Could cause indirect adverse effects or very difficult to implement

### Example Scoring

<table>
<thead>
<tr>
<th>Hazard Mitigation Plan Evaluation</th>
<th>Life Safety Protection</th>
<th>Technical and Information</th>
<th>Social and Community Objectives</th>
<th>Total Score</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Example: Implement a Firewise Program</td>
<td>Life Safety Protection</td>
<td>Technical and Information</td>
<td>Social and Community Objectives</td>
<td>Total Score</td>
<td>Score</td>
</tr>
</tbody>
</table>

### Example Values

- Life Safety Protection: 1
- Technical and Information: 2
- Social and Community Objectives: 0
- Total Score: 2
- Score: 1
B-3: Mitigation Initiative Template Instructions

Hazard Mitigation Initiatives Form Instructions

Prioritization

The mitigation initiatives are prioritized by the individual jurisdictions based on the conditions and needs of each community. They should be ranked according to their overall benefit and their relationship to the plan’s goals and objectives. FEMA does not require a numeric rating. They could be ranked high, medium, or low. They could be ranked as tier 1, tier 2, etc.

Category

Every mitigation initiative is categorized according to the type of mitigating function it provides. Seven mitigation initiative categories were identified in the original plan and remain the same as follows:

1. Public Outreach and Information: Information delivered in a variety of formats intended to inform and educate community members, elected officials, and property owners about the hazards and potential ways to mitigate them. Such actions include websites, outreach projects, real estate disclosure, fairs and expos, and school-age and adult education programs.

2. Plan Coordination and Implementation: Activities that support a jurisdiction’s hazards mitigation planning process and implementation strategy within their organization and in conjunction with neighboring jurisdictions and relevant stakeholders.

3. Data Collection and Mapping: Actions that relate to the process of gathering and analyzing new data and then mapping or utilizing the information in such a manner that it improves communities’ ability to make informed decisions about increasing their disaster resilience.

4. Development Regulations: Government administrative or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses. Examples include planning and zoning, building codes, capital improvement programs, open space preservation, and storm water management regulations.

5. Hazard Preparedness: Advance actions that serve to protect people and property during and immediately after a disaster or hazard event. These could include the development or improvement of warning systems, emergency response services, and the stockpiling of supplies and materials.

6. Hazard Damage Reduction: Actions that involve the modification of existing buildings or structures to protect them from a hazard, or removal from the hazard area.
Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.

7. **Critical Facilities Replacement/Retrofit**: Refers specifically to hazard damage reduction activities targeted specifically at protecting or replacing critical facilities.

**Mitigation Initiative Format**

A mitigation initiative form is provided so every jurisdiction can document their mitigation initiatives consistently. A brief description of each input field is described below.

**Priority**: the current ranking of the mitigation initiative as assigned by the jurisdiction, for example 1 of 10. If an initiative was completed or removed, a ranking is not applicable and is shown as “N/A”

**Status**: “New” refers to a mitigation initiative newly created as part of the plan update process; “existing” refers to an unfinished initiative that is carried over from previous Hazards Mitigation Plans, or imported from another planning document; “modified” refers to an existing initiative that carried over from the previous plan, but has been modified to suit current need (a revised scope); “completed” refers to an initiative that was successfully fulfilled; and “removed” refers to an initiative that is no longer considered relevant or is replaced by another initiative.

**Hazard Addressed**: refers to the specific hazard, profiled in the risk assessment that the mitigation initiative addresses, for example “earthquake,” or “multi-hazard.”

**Category**: refers to one of the seven function mitigation categories identified above, for example, “data collection and mapping.”

**Mitigation Initiative Identification Number**: this refers to the unique administrative code of each mitigation initiative. The unique code allows local agencies and plan reviewers to monitor the progress of each initiative through its lifecycle. The codes from previous plans will be carried over as appropriate. The convention of the identification number is as follows:

\[ \text{Agency Code} + \text{Hazard Category Code} + \text{Sequential number}. \]

**Title**: a brief description of the action to be taken.

**Rationale**: a statement of justification as to why the mitigation initiative is necessary.
Relates to Plan Goal(s) and Objectives: refers to the specific goal(s) and objective(s) that the mitigation initiative supports.

Implementer: refers to the agency department or title of the staff member responsible for implementing the initiative.

Estimated Cost: refers to the current estimated cost of the initiative.

Time Period: refers to when the agency believes it will be able to accomplish the initiative. For example, 2012 or 2025.

Funding Source: refers to the anticipated source of revenue that will be used to fund the initiative.

Source and Date: refers to an agency document from which an initiative may have been originally identified. For example, “2003 Natural Hazards Mitigation Plan for the Thurston Region.”

Adopted Plan Number: refers to the identifier of the initiative within the sourced adopted document.

Reference Page: refers to the page which the initiative can be found in the adopted document.

Implementation Status: a narrative assessment of the progress made on the initiative.
**B-4: Mitigation Initiative Template**

**Priority:** Number of Total

**Status:** Select one.

Agency Code-Hazard Category Code Sequential Number: Title: The title should be a brief, but descriptive explanation of the action to be taken. Type it here or copy from the previous plan or another source.

**Hazard Addressed:** Hazard Type

**Category:** Category

**Rationale:** This is a statement of justification for why the mitigation initiative is necessary. A brief narrative should include a problem statement (what is the real or potential impact from the hazard?) A description of how the action will mitigate the problem should also be included.

**Relates to Plan Goal(s) and Objectives:** Identify relevant planning goals and objectives that the mitigation initiative will support. These are the mitigation goals and objectives located in Chapter 5. Example, 1A, 1B.

**Implementer:** Enter the department or lead position of the staff member responsible for implementing the initiative.

**Estimated Cost:** Enter the approximate dollar amount of the cost to implement the action, i.e. $450,000. If unknown, state reason the cost is unknown. If the initiative is a carry-over from the original plan, do the cost estimates require updating? If so, enter new cost estimate.

**Time Period:** Enter the estimated timeline when the initiative will be accomplished. For example, 2016 or 2025. If it was completed since the last plan, state the month and year the initiative was completed. If the initiative is a carry-over, update the new estimated timeline for completion.

**Funding Source:** Describe the sources of revenue that will be used to finance the initiative. If a carry-over initiative, consider a new funding source, if appropriate.

**Source and Date:** Refers to an agency document from which an initiative may have been originally identified. For example, Natural Hazards Mitigation Plan, Thurston County 1999 Flood Hazard Management Plan. Include Capitol Facility Plans, Storm Water Utility Plans, etc. If not applicable, please enter N/A.

**Adopted Plan Number:** Refers to the identifiers of the initiative within the adopted document. If not applicable, please enter N/A.

**Reference Page:** Refers to the identifiers of the initiative within the adopted document. If not applicable, please enter N/A.

**Initiative and Implementation Status:** Explain the status of this action item if it carries over from the last plan, was modified, or was completed. If new, enter “New”.
## B-5: Countywide Mitigation Initiatives Prioritization Survey

Prioritizing the Countywide Hazard Mitigation Initiatives

<table>
<thead>
<tr>
<th>Survey Participant Information</th>
<th>Name</th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Agency</th>
<th></th>
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</thead>
</table>

The following Countywide Hazard Mitigation Initiatives are listed in the order they were ranked in the 2009 Hazard Mitigation Plan for the Thurston Region. A copy of the draft initiatives was sent by email to the survey participants. Please prioritize each initiative with a unique rank from 1 (highest priority) to 11 (lowest priority). No two initiatives can have the same rank.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 of 11, CW-MH 4, Hazard Damage Reduction</td>
<td>Create a lifeline transportation route GIS map for the Thurston region and integrate the data into the Thurston County Emergency Operations Plan and other local planning needs.</td>
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<tr>
<td>2 of 11, CW-MH 7, Hazard Preparedness</td>
<td>Develop interjurisdictional capabilities to share critical resources during emergencies and natural disaster events.</td>
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<tr>
<td>3 of 11, CW-SH 1, Hazard Preparedness</td>
<td>Improve the capabilities of disaster debris management.</td>
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<tr>
<td>4 of 11, CS-FH 1, Data Collection and Mapping</td>
<td>Develop emergency evacuation routes, and update affected agencies comprehensive Emergency Management Plans for areas affected by potential catastrophic dam failure.</td>
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<tr>
<td>5 of 11, CW-MH 6, Public Information</td>
<td>Develop a public information and outreach website, complementary printed materials, use social media, and convene community events to increase the awareness and participation in hazards mitigation for...</td>
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<tr>
<td>6 of 11, CW-WH 1, Data Collection and Mapping</td>
<td>Map the region’s high risk wildland urban interface communities.</td>
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<tr>
<td>7 of 11, CS-MH 1, Data Collection and Mapping</td>
<td>Continue to refine the list of the region’s critical facilities and jurisdictional asset data and develop database to support hazard mitigation planning and emergency management.</td>
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<tr>
<td></td>
<td>8 of 11, CW-EH 2, Data Collection and Mapping - Improve the technical analysis of earthquake hazards in the county and integrate modeling capacity into emergency management work programs.</td>
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<td></td>
<td>9 of 11, CW-MH 8, Hazard Preparedness - Strengthen the capabilities of the Disaster Medical Coordination Center (DMCC) Hospital.</td>
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<td></td>
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<tr>
<td></td>
<td>10 of 11, CW-MH 9, Data Collection and Mapping - Map transportation infrastructure that is subject to frequent flooding or is prone to landslide hazards.</td>
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<td>11</td>
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<tr>
<td></td>
<td>11 of 11, CW-MH 10, Plan &amp; Coordination Implementation - Develop and adopt a Climate Adaptation Plan</td>
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</tbody>
</table>

The results of this exercise will be shared with the Hazard Mitigation Workgroup Members.
Planning partners used a variety of data sources to analyze risk and develop the hazard profiles for the Risk Assessment in Chapters 4.1 through 4.6. Thurston Regional Planning Council’s (TRPC) Geographical Information System (GIS) supported creation of the hazard exposure analysis for addressing the portion of the region’s affected area, population, employment, residential dwellings, valuation, and essential facilities for Thurston County jurisdictions.

Parcel Data – Estimates of Building Value

For all assets, other than those owned and maintained by participating jurisdictions, the plan assumes replacement building value as equivalent to assessed building value. The Thurston County Office of the Assessor (2014 assessment) provided tax-parcel level valuations. The Assessor does not perform assessments for non-taxable structures, such as state and federal government owned buildings. The plan partners and other stakeholders supplied additional valuation data for publicly owned buildings with their essential facilities data.
Building Contents – Estimates of Value

For all assets other than those owned and maintained by participating jurisdictions, the plan estimates building contents value based on general criteria defined for HAZUS-MH, a GIS hazard modeling tool. Each building in Thurston County is categorized based on its occupancy class, and building contents value is estimated as a percentage of the building replacement value based on that class.

Table C-1: Contents Valuation Classification

<table>
<thead>
<tr>
<th>Occupancy Class</th>
<th>Contents Value % 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential (including temporary lodging, dormitory, and nursing homes)</td>
<td>50</td>
</tr>
<tr>
<td>Commercial (including retail, wholesale, professional, services, financial, entertainment and recreation)</td>
<td>100</td>
</tr>
<tr>
<td>Commercial (including hospitals and medical office/clinic)</td>
<td>150</td>
</tr>
<tr>
<td>Commercial Parking</td>
<td>50</td>
</tr>
<tr>
<td>Industrial (including heavy, light, technology)</td>
<td>150</td>
</tr>
<tr>
<td>Agriculture</td>
<td>100</td>
</tr>
<tr>
<td>Religion/Non-Profit</td>
<td>100</td>
</tr>
<tr>
<td>Government Emergency Response</td>
<td>150</td>
</tr>
<tr>
<td>Government General Services</td>
<td>100</td>
</tr>
<tr>
<td>Education Schools/Libraries</td>
<td>100</td>
</tr>
<tr>
<td>Education Colleges/Universities</td>
<td>150</td>
</tr>
</tbody>
</table>

1Note: Contents are calculated as a percentage of a building’s replacement value.
**Hazard Data Sources**

Thurston County, Washington State Departments of Natural Resources and Ecology, the United States Geological Survey, the Federal Emergency Management Agency (FEMA), and others contributed spatial hazard data. Table C-2 lists the hazard data sources used to support the plan’s risk assessment.

**Table C-2: Spatial Hazard Data Sources**

<table>
<thead>
<tr>
<th>Spatial Data</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Special Flood Hazard Areas</td>
<td>2012 Thurston County DFIRM and Deschutes River SFHAs (adopted 2016).</td>
</tr>
<tr>
<td>• 100-Year Plain</td>
<td></td>
</tr>
<tr>
<td>• 500-Year Floodplain</td>
<td></td>
</tr>
<tr>
<td>• Coastal Flood Zones</td>
<td>Thurston County High Groundwater Hazard Area.</td>
</tr>
<tr>
<td>High Groundwater Hazard Area</td>
<td></td>
</tr>
<tr>
<td>Historic Landslides</td>
<td>Washington State Department of Natural Resources, Geology and Earth Resources Division, from the Landslides and Landforms dataset, First Quarter, 2015</td>
</tr>
<tr>
<td>Landslide Hazards, Steep Slopes</td>
<td>Thurston GeoData Center, areas of 40% or greater slope, revised 12/12/2013</td>
</tr>
<tr>
<td>Wildland Urban Interface Areas</td>
<td>Washington State Department of Natural Resources</td>
</tr>
<tr>
<td>Dam Data</td>
<td>Washington State Department of Ecology</td>
</tr>
</tbody>
</table>
Appendix C: Risk Assessment Data Sources and Methodology

Essential Facilities

The plan partners supplied over 1,300 records containing public essential facilities data, creating a catalog of point location information for key assets such as city halls, fire stations, law enforcement facilities, correctional facilities, communications, water treatment systems, wells, schools, and many other facilities and utilities. The inventory gathered data on the common names of facilities, location, replacement cost, contents valuation, design quality, construction type, year built, square footage, and occupancy classification. The data was geocoded and used for level 2 flood and earthquake HAZUS analysis performed by FEMA and its Risk MAP program contractor, STARR.

Thurston County Public Health and Social Services furnished additional private essential facilities data for hospitals, medical clinics, treatment centers, dental clinics, pharmacies, and other licensed medical facilities. Location data on nursing homes, assisted living facilities, and other licensed health care residences was acquired from Washington State Department of Social and Health Services.

Both sets of essential facilities data supported the hazard exposure analysis for each hazard profile. TRPC maintains the essential facilities database for this plan.

Population, Dwelling Unit, and Employment Estimates and Forecasts

The hazard exposure analysis uses TRPC’s population and employment forecasts. Updated every three to five years, the forecasts support transportation, sewer, water, land use, school, and other local governmental planning purposes.

TRPC adopted a new county-wide forecast on July 13, 2012. Employment allocations and population distributions to small areas such as cities, towns, tribes, school districts, fire districts, and other special districts and taxing
boundaries were adopted on July 10, 2015. The 2015 update extended the population and employment allocations to cities and towns to the forecast year 2040 and the employment forecast base year to 2014. These forecasts comprise the base-year and forecast year datasets for the hazard exposure analysis presented in this plan.

Hazard Exposure Analysis Methodology

The proportion of the jurisdictions’ land area, population, employment, residential units, and building valuation, exposed to the hazards identified in the risk assessment, was calculated using GIS. For each hazard, the hazard boundaries or layers were superimposed on tax-parcels to assess the portion of the parcel covered by the hazard layer. The value of the portion of the affected parcel was used to estimate the portion of the exposed population, residential dwellings, employment, and building valuations. For example, if 25 percent of a parcel was within the 100-year flood plain, then 25 percent of the dwelling was estimated at risk for flood and so on for the other attributes for all hazard profiles except storm.

For the essential facilities, each facility location was identified as in or out of the affected hazard area. The detailed results were shared with the jurisdictions. The essential facilities in the hazard area are aggregated to the entire planning area.
Appendix D

Federal Hazard Mitigation Assistance Grant Programs

The Department of Homeland Security Federal Emergency Management Agency (FEMA) Hazard Mitigation Assistance programs offer a variety of federal grant opportunities to states, tribes, and local governments. Appendix D includes a FEMA fact sheet about these programs, eligibility, match requirements, and the application process.

The Washington State Military Department Emergency Management Division acts as the grantee, with responsibility for notifying potential applicants of the availability of funding, defining the project selection process, ranking and prioritizing projects, and forwarding the projects to FEMA for funding.

- D-1: FEMA Hazard Mitigation Assistance Program Fact Sheet
- D-2: Washington State Military Department Hazard Mitigation Grant Program DR-4242 and DR-4243 Fact Sheet
The Hazard Mitigation Assistance Grant Programs

Hazard Mitigation Assistance

The Department of Homeland Security (DHS) Federal Emergency Management Agency (FEMA) Hazard Mitigation Assistance (HMA) programs present a critical opportunity to reduce the risk to individuals and property from natural hazards while simultaneously reducing reliance on Federal disaster funds.

A Common Goal

While the statutory origins of the programs differ, all share the common goal of reducing the loss of life and property due to natural hazards.

Funding Disaster Recovery Efforts

The Hazard Mitigation Grant Program (HMGP) may provide funds to States, territories, federally-recognized tribes, local governments, and eligible private non-profits following a Presidential major disaster declaration.

The Hazard Mitigation Grant Program (HMGP) is authorized by Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended (the Stafford Act), Title 42, United States Code (U.S.C.) 5170c. The key purpose of HMGP is to ensure that the opportunity to take critical mitigation measures to reduce the risk of loss of life and property from future disasters is not lost during the reconstruction process following a disaster. HMGP is available, when authorized under a Presidential major disaster declaration, in the areas of the State or territory requested by the Governor. The amount of HMGP funding available to the Applicant is based upon the total Federal assistance to be provided by FEMA for disaster recovery under the Presidential major disaster declaration. Federally-recognized tribal governments can submit a request for a major disaster declaration within their impacted areas.

The Pre-Disaster Mitigation (PDM) program is authorized by Section 203 of the Stafford Act, 42 U.S.C. 5133. The PDM program is designed to assist States, territories, federally-recognized tribes, and local communities in implementing a sustained pre-disaster natural hazard mitigation program to reduce overall risk to the population and structures from future hazard events, while also reducing reliance on Federal funding from future disasters.

The Flood Mitigation Assistance (FMA) program is authorized by Section 1366 of the National Flood Insurance Act of 1968, as amended (NFIA), 42 U.S.C. 4104c, with the goal of mitigating flood damaged properties to reduce or eliminate claims under the National Flood Insurance Program (NFIP).

Additional HMA resources, including the HMA Guidance, may be accessed at http://www.fema.gov/hazard-mitigation-assistance
Program Comparisons

Cost Sharing

In general, HMA funds may be used to pay up to 75 percent of the eligible activity costs. The remaining 25 percent of eligible costs are derived from non-Federal sources. The table below outlines the Federal and State cost share requirements.

<table>
<thead>
<tr>
<th>Program Cost Share Requirements</th>
<th>Mitigation Activity Award (Percent of Federal/Non-Federal Share)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HMGP</td>
<td>75 / 25</td>
</tr>
<tr>
<td>PDM</td>
<td>75 / 25</td>
</tr>
<tr>
<td>PDM (subrecipient is small impoverished community)</td>
<td>90 / 10</td>
</tr>
<tr>
<td>PDM (federally-recognized tribal Recipient is small impoverished community)</td>
<td>90 / 10</td>
</tr>
<tr>
<td>FMA (Insured properties and planning grants)</td>
<td>75 / 25</td>
</tr>
<tr>
<td>FMA (repetitive loss property with repetitive loss strategy)</td>
<td>90 / 10</td>
</tr>
<tr>
<td>FMA (severe repetitive loss property with repetitive loss strategy)</td>
<td>100 / 0</td>
</tr>
</tbody>
</table>

Eligible Applicants and Subapplicants

States, territories, and federally-recognized tribal governments are eligible HMA Applicants. Each State, territory, and federally-recognized tribal government shall designate one agency to serve as the Applicant for each HMA program. All interested subapplicants must apply to the Applicant. Individuals and businesses may not apply directly to the State, territory, or FEMA, but eligible local governments may apply on their behalf. The table below identifies, in general, eligible subapplicants.

<table>
<thead>
<tr>
<th>Eligible Subapplicants</th>
<th>HMGP</th>
<th>PDM</th>
<th>FMA</th>
</tr>
</thead>
<tbody>
<tr>
<td>State agencies</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Federally-recognized tribes</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Local governments/communities*</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Private nonprofit organizations (PNPs)</td>
<td>✔</td>
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</tbody>
</table>

* Local governments/community may include non federally-recognized tribes, or consistent with definition of local government at 44 CFR 201.2, may include any Indian tribe or authorized tribal organization, or Alaska Native village or organization that is not federally-recognized per 25 U.S.C. 479a et seq.
**Eligible Activities**

The table below summarizes eligible activities that may be funded by HMA programs. Detailed descriptions of these activities can be found in the HMA Guidance.

<table>
<thead>
<tr>
<th>Eligible Activities</th>
<th>HMGP</th>
<th>PDM</th>
<th>FMA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Mitigation Projects</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Property Acquisition and Structure Demolition</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Property Acquisition and Structure Relocation</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Structure Elevation</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
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<td>Mitigation Reconstruction</td>
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<td>Dry Floodproofing of Historic Residential Structures</td>
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<td>Dry Floodproofing of Non-Residential Structures</td>
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<td>Generators</td>
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<td>Localized Flood Risk Reduction Projects</td>
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<td>Non-Localized Flood Risk Reduction Projects</td>
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<td>Structural Retrofitting of Existing Buildings</td>
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<td>Non-Structural Retrofitting of Existing Buildings and Facilities</td>
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<td>Safe Room Construction</td>
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<td>Wind Retrofit for One- and Two-Family Residences</td>
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<td>Infrastructure Retrofit</td>
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<td>Soil Stabilization</td>
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<td>Wildfire Mitigation</td>
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<td>Post-Disaster Code Enforcement</td>
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<tr>
<td>Advance Assistance</td>
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<td>5 Percent Initiative Projects*</td>
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<tr>
<td>Miscellaneous/Other**</td>
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<td>2. Hazard Mitigation Planning</td>
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<td>Planning-Related Activities</td>
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<td>3. Technical Assistance</td>
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<tr>
<td>4. Management Costs</td>
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* FEMA allows increasing the 5% Initiative amount up to 10% for a Presidential major disaster declaration under HMGP. The additional 5% Initiative funding can be used for activities that promote disaster-resistant codes for all hazards. As a condition of the award, either a disaster-resistant building code must be adopted or an improved Building Code Effectiveness Grading Schedule is required.

** Miscellaneous/Other indicates that any proposed action will be evaluated on its own merit against program requirements. Eligible projects will be approved provided funding is available.

### Management Costs

**For HMGP only:** The Recipient may request up to 4.89 percent of the HMGP allocation for management costs. The Recipient is responsible for determining the amount, if any, of funds that will be passed through to the subrecipient(s) for their management costs.

**Applicants for PDM and FMA may apply for a maximum of 10 percent of the total funds requested in their award application budget (Federal and non-Federal shares) for management costs to support the project and planning subapplications included as part of their application.**

**Subapplicants for PDM and FMA may apply for a maximum of 5 percent of the total funds requested in a subapplication for management costs.**

### National Flood Insurance Program (NFIP) Participation

There are a number of ways that HMA eligibility is related to the NFIP:

**Subapplicant Eligibility:**

All subapplicants for FMA must be participating in the NFIP, and not be withdrawn or suspended, to be eligible to apply for grant funds. Certain political subdivisions (i.e., regional flood control districts or county governments) may apply and act as subrecipients if they are part of a community that is participating in the NFIP where the political subdivision provides zoning and building code enforcement or planning and community development professional services for that community.

**Project Eligibility:**

HMGP and PDM mitigation project subapplications for projects sited within a Special Flood Hazard Area (SFHA) are eligible only if the jurisdiction in which the project is located is participating in the NFIP. There is no NFIP participation requirement for HMGP and PDM project subapplications located outside of the SFHA.

**Property Eligibility:**

Properties included in a project subapplication for FMA funding must be NFIP-insured at the time of the application submittal. Flood insurance must be maintained for the life of the structure.
Application Process

Applications for HMGP are processed through the HMGP system (formerly known as National Emergency Management Information System [NEMIS]). Applicants use the Application Development Module of the HMGP System, which enables each Applicant to create project applications and submit them to the appropriate FEMA Region within 12 months of a disaster declaration.

Applications for PDM and FMA are processed through a web-based, electronic grants management system (eGrants), which encompasses the entire grant application process. The eGrants system allows Applicants and subapplicants to apply for and manage their mitigation grant application processes electronically. Applicants and subapplicants can access eGrants at https://portal.fema.gov.

FEMA Review and Selection

FEMA will review all subapplications for eligibility and completeness, cost-effectiveness, technical feasibility and effectiveness, and for EHP compliance. Subapplications that do not pass these reviews will not be considered for funding. FEMA will notify Applicants of the status of their subapplications and will work with Applicants on subapplications identified for further review.

GovDelivery Notifications

Stay up-to-date on the HMA Programs by subscribing to GovDelivery notifications. Have updates delivered to an e-mail address or mobile device. To learn more, visit http://www.fema.gov

Contact Information

HMA Helpline: 866-222-3580
FEMA eGrants Helpdesk: 1-855-228-3362
Benefit-Cost Analysis Helpline: BCHelpline@fema.dhs.gov
For HMA independent study and classroom courses, visit http://training.fema.gov
To find your State Hazard Mitigation Office, visit http://www.fema.gov/state-hazard-mitigation-officers
HAZARD MITIGATION GRANT PROGRAM
DR-4242 & DR-4243
Fact Sheet

Washington State Military Department  Emergency Management Division  Camp Murray, WA  98430

The Hazard Mitigation Grant Program (HMGP) is available to the State of Washington following a Presidential declaration of a major disaster. This state-administered program is authorized by the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Section 404 of Public Law 93-288, as amended. HMGP funds mitigation planning initiatives and mitigation projects designed to reduce or eliminate the effects and costs of future disaster damage.

ELIGIBLE APPLICANTS

- State Government
- Special Districts
- Certain Private Nonprofit Organizations providing Government Services and Facilities
- Local Government
- Indian Tribes
- Like-Government Services and Facilities

Applicants must be jurisdictions that are participating in and in good standing with the National Flood Insurance Program, and in compliance with State Growth Management Act requirements, or located in a community that is.

FUNDING CONSTRAINTS

The grants are available to eligible applicants on a competitive basis with the following cost share: 75 percent federal and 25 percent non-federal (applicant and state may split this share, based on legislative approval). The amount available for the HMGP is based on a percentage of FEMA expenditures on disaster assistance, which may limit the size of projects and grant awards. All mitigation project proposals will be evaluated against federal and state program criteria and they must be must be cost-effective.

APPLICATION & FUNDING PROCESS

1. Potential applicants submit pre-applications to participate in the program.
2. Following review of pre-applications, the State Emergency Management Division (State EMD) provides application packets to eligible applicants with potentially eligible projects.
3. State EMD reviews submitted applications for eligibility, with site visits conducted as necessary.
4. A state-local review committee evaluates and scores the applications.
5. State EMD recommends projects to FEMA for funding based upon scores and available funds.
6. FEMA makes grant awards following its review, which includes environmental and historic preservation considerations, as required.
7. Upon notification of approval and funding, State EMD prepares a grant funding agreement with the applicant and provides a notice to proceed.

ELIGIBLE PLANS & PROJECTS

Among the eligible mitigation projects are (see FY 2015 Hazard Mitigation Assistance Program Guidance, page 33):

- Property Acquisition and Structure Demolition
- Property Acquisition and Structure Relocation
Appendix D: Federal Hazard Mitigation Assistance Grant Programs

- Structure Elevation
- Mitigation Reconstruction
- Dry Flood-proofing of Historic Residential Structures
- Dry Flood-proofing of Non-Residential Structures
- Generators (for critical facilities/infrastructure)
- Localized Flood Risk Reduction Projects
- Non-localized Flood Risk Reduction Projects
- Structural Retrofitting of Existing Buildings
- Non-structural Retrofitting of Existing Buildings and Facilities
- Safe Room Construction
- Wind Retrofit for One- and Two-Family Residences
- Infrastructure Retrofit (utility systems, roads, bridges)
- Soil Stabilization
- Wildfire Mitigation
- Post-Disaster Code Enforcement
- 5% Initiative Projects
- **Climate Resilient Mitigation** (Aquifer Storage and Recovery; Floodplain and Stream Restoration; Flood Diversion and Storage; and Green Infrastructure. See FEMA Fact Sheets for more information on these newly eligible activities
- (*) Miscellaneous/Other

(*) Any proposed action will be evaluated on its own merit against program requirements. Eligible projects will be approved provided funding is available. There is an emphasis on projects that address Climate Change and Resilience.

**NOTE:** Applicants **must** have a FEMA-approved Hazard Mitigation plan in order to be eligible to apply for project grant funds.

**INELIGIBLE MITIGATION ACTIVITIES**

Among the ineligible mitigation projects are (*see FY 2015 Hazard Mitigation Assistance Program Guidance*, pages 42-44):

- Projects that do not reduce the risk to people, homes, neighborhoods, structures, or infrastructure
- Projects dependent on a contingent action to be effective and/or feasible (i.e., not stand-alone)
- Projects with the sole purpose of open space acquisition of unimproved land
- Property acquisition projects that are not compatible with open space and do not maintain open space for the conservation of natural floodplain functions or properties that include encumbrances that may allow for horizontal drilling or fracking
- Non-localized flood risk reduction projects specific to FMA
- Flood control projects related to the repair or replacement of dams or flood control structures and repair of dams for the purpose of regular pre-scheduled or damage-induced maintenance
- Projects for which actual physical work such as groundbreaking, demolition, or construction has occurred prior to grant award
- Projects for preparedness activities or temporary measures (e.g., sandbags, bladders, geotubes)
- Projects that create revolving loan funds
- Activities required as a result of negligence or intentional actions that contributed to the
conditions to be mitigated; activities intended to remedy a code violation; or the reimbursement of legal obligations, such as those imposed by a legal settlement, court order, or State law

- All projects located in Coastal Barrier Resources System (CBRS) Units, other than property acquisition and structural demolition or relocation projects for open space under HMA
- Projects located in an OPA that require flood insurance after project completion
- Activities on Federal lands or associated with facilities owned by another Federal entity
- Projects related to beach nourishment or re-nourishment
- Projects for hazardous fuels reduction in excess of 2 miles from at-risk buildings and structures
- Projects that address unmet needs from a disaster that are not related to mitigation
- Retrofitting facilities primarily used for religious purposes, such as places of worship (or other projects that solely benefit religious organizations)
- Activities that only address manmade hazards
- Projects that address, without an increase in the level of protection, the operation, deferred or future maintenance, rehabilitation, restoration, or replacement of existing structures, facilities, or infrastructure (e.g., dredging, debris removal, replacement of obsolete utility systems or bridges)
- Landscaping for ornamentation (e.g., trees, shrubs)
- Site remediation of hazardous materials (with the exception of eligible activities)
- Water quality infrastructure projects
- Projects that address ecological issues related to land and forest management
- Prescribed burning or clear-cutting
- Creation and maintenance of fire breaks, access roads, or staging areas
- Irrigation systems
- Preparedness measures and response equipment (e.g., response training, electronic evacuation road signs, interoperable communications equipment)
- Studies no directly related to the design and implementation of a proposed mitigation project
- Information dissemination activities that exceed 10 percent of the total planning application
- Limited plan revisions that do not result in comprehensive hazard mitigation plan update

**CONTACTS:**

For more information on the Hazard Mitigation Grant Program, contact:
Hazard Mitigation Grant Program Section All-Staff E-mail, HMGP@mil.wa.gov

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