

Appendix I HR-3 and Supporting Documentation

Enrolled

House Resolution 3

Sponsored by Representative BOONE; Representatives COWAN, KRIEGER, ROBLAN, WITT, Senators COURTNEY, JOHNSON, KRUSE, VERGER, WHITSETT

Whereas Oregon is known to be seismically active, with geological faults creating earthquake hazards in most of the state, including its most highly populated counties; and

Whereas the most serious risks linked to earthquakes in Oregon are associated with the Cascadia fault, recognized as one of the world's most dangerous faults and capable of generating megathrust earthquakes at least 1,000 times more powerful than the magnitude 6.8 Nisqually, Washington, earthquake of February 2001 and producing associated tsunamis capable of affecting extensive areas of the Oregon coast; and

Whereas geological evidence documents about 41 earthquakes of magnitude 8 and larger on sections of the Cascadia fault during the last 10,000 years, yielding an average interval between events of about 240 years; and

Whereas the most recent megathrust earthquake on the Cascadia fault, estimated to be about magnitude 9, occurred on January 26, 1700; and

Whereas many of the earthquakes on the Cascadia fault have been separated by intervals shorter than the time elapsed since the most recent Cascadia earthquake; and

Whereas an earthquake of magnitude 8 or larger and its associated tsunami would have devastating impacts to coastal communities and throughout western Oregon, causing thousands of casualties and premature deaths and inflicting tens of billions of dollars in physical damage that would have crippling impacts on the state's economy; and

Whereas policies now in place are insufficient to protect citizens and businesses in Oregon from the ground shaking and waves associated with a Cascadia megathrust earthquake and to ensure a smooth economic recovery after that event; now, therefore,

Be It Resolved by the House of Representatives of the State of Oregon:

That concern for the protection of life and the resumption of commerce should guide the State of Oregon in the development and implementation of resilience policies that address the risks posed by a Cascadia megathrust earthquake and tsunami; and be it further

Resolved, That Oregon's most forward-thinking policies and programs to advance resilience to earthquakes include the Seismic Rehabilitation Grant Program, fully enacted with general obligation bond funding by the 75th Legislative Assembly in 2009; and be it further

Resolved, That the strengthening of collapse-prone public structures, including, but not limited to, K-12 schools, community colleges and public safety facilities, should be recognized by the Governor and Legislative Assembly as top investment priorities in this state's capital budget; and be it further

Resolved, That seismic improvements to K-12 schools, community colleges and public safety facilities funded by Seismic Rehabilitation Grants should be recognized with placards affixed to the reinforced structures; and be it further

Resolved, That this state's investment in Seismic Rehabilitation Grants and in other programs and resources to accomplish seismic upgrades of public buildings should be expanded to the extent fiscal prudence allows; and be it further

Resolved, That this state should make investments in additional evacuation options for Oregon coastal communities that cannot ensure adequate protection of their residents and visitors from tsunamis because of distance from safe ground; and be it further

Resolved, That this state should make investments necessary to establish a Critical Transportation Infrastructure providing reliable lifelines for emergency response and economic recovery in the aftermath of a Cascadia earthquake and tsunami; and be it further

Resolved, That this state should make investments necessary to establish a Critical Energy Infrastructure comprising transmission networks for electricity, liquid fuels and natural gas hardened to withstand a Cascadia earthquake and tsunami; and be it further

Resolved, That seismic resilience should be viewed as a necessary complement to environmental sustainability and endorsed as a priority by the Governor and the Legislative Assembly; and be it further

Resolved, That the Seismic Safety Policy Advisory Commission should lead and coordinate preparation of an Oregon Resilience Plan that reviews policy options, summarizes relevant reports and studies by state agencies and makes recommendations on policy direction to protect lives and keep commerce flowing during and after a Cascadia earthquake and tsunami; and be it further

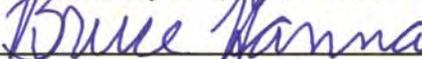
Resolved, That the commission should enlist the participation of the Governor's public safety advisor, state agencies, commissions and other advisory bodies, as needed, to assemble an integrated view of current state capabilities and gaps in resilience planning; and be it further

Resolved, That the Oregon Resilience Plan and recommendations should be delivered to the Legislative Assembly no later than February 28, 2013, so that the inevitable natural disaster of a Cascadia megathrust earthquake and tsunami does not cause an unprecedented catastrophe for the State of Oregon.

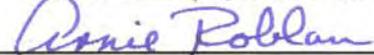
Adopted by House April 18, 2011



Ramona Kenady Line, Chief Clerk of House



Bruce Hanna, Speaker of House



Arnie Roblan, Speaker of House



NATIONAL SECURITY STAFF
WASHINGTON, D.C. 20504

December 7, 2011

Kent Yu, PhD
Chairman, Oregon Seismic Safety Policy Advisory Commission
P.O.Box 14370
Salem, OR
97309 5062

Dr. Yu:

On Tuesday, November 8, 2011 I had the pleasure of spending time with the working session of the National Earthquake Hazard Reduction Program (NHERP) Advisory Committee. There, I was honored to meet Deborah Boone, Oregon State Representative and sponsor of Oregon House Resolution 3, which directs the creation of an Oregon Resilience Plan to prepare for the statewide impacts of a Cascadia earthquake and tsunami. I would like to wholeheartedly applaud Representative Boone, yourself, and the rest of the Oregon Seismic Safety Policy Advisory Commission on this initiative..

President Obama's top priority is the safety and security of the American people. I thank you for your leadership and your ongoing contribution to our Nation's resilience.

Sincerely,



Richard Reed
Special Assistant to the President for
National Security Affairs and
Senior Director for Resilience

**Deborah Boone
State Representative
HD 32**



**900 Court Street NE
Salem, OR 97301
503-986-1432**

October 17, 2011

Richard A. Reed
Senior Director for Resilience Policy
National Security Council
The White House
1600 Pennsylvania Avenue NW
Washington, DC 20500

Dear Mr. Reed,

I am writing in regard to your responsibility for implementation of Presidential Policy Directive 8 on National Preparedness. According to that Directive, *"Each national planning framework shall include guidance to support corresponding planning for State, local, tribal, and territorial governments."*

During the November 2011 meeting of the NEHRP Advisory Committee on Earthquake Hazard Reduction, I have asked Advisory Committee member Yumei Wang to share with you a copy of Oregon House Resolution 3, which I sponsored and my colleagues adopted unanimously in Oregon's House of Representatives on April 18, 2011.

H.R. 3 directs our state Seismic Safety Policy Advisory Commission (OSSPAC), on which I serve, to prepare an Oregon Resilience Plan to make recommendations on policy direction to protect lives and keep commerce flowing during and after the next Cascadia earthquake and tsunami expected to strike our state.

This is the first step Oregon will take to prepare comprehensively for the statewide impacts of a Cascadia earthquake and tsunami, and the only example of state legislation to initiate seismic resilience planning of which I am aware. Our intent is to address, to the extent feasible, the five mission areas identified in PPD-8: prevention, protection, mitigation, response, and recovery.

I would like to request your endorsement in writing of Oregon's resilience planning efforts, as a State initiative consistent with the intent of PPD-8 and worthy of support in its development and implementation by all branches and agencies of Oregon's state government and by appropriate

federal agencies.

Your letter to OSSPAC Chairman Dr. Kent Yu (address below) endorsing Oregon's resilience planning commitment will provide timely encouragement as we begin to engage the state's leadership in preparing the Oregon Resilience Plan during the next several months.

Thank you for your dedication to national preparedness and resilience.

Sincerely,

Rep. Deborah Boone

Cc: Kent Yu, Ph.D
Chairman
Oregon Seismic Safety Policy Advisory Commission (OSSPAC)
Attn: Beverly Hall
Oregon Emergency Management
P.O. Box 14370
Salem, OR 97309-5062

Encl.: H.R. 3 enrolled



JOHN A. KITZHABER, MD
Governor

January 4, 2012

Kent Yu, Ph.D, Chair
Oregon Seismic Safety Policy Advisory Commission
P.O. Box 14370
Salem, OR 97309

Dear Dr. Yu,

The Oregon Seismic Safety Policy Advisory Commission (OSSPAC) has a challenging mission to educate the public about our seismic risks and inform diverse policy decisions. Through OSSPAC's dedicated efforts, though, the State of Oregon and its citizens have become increasingly aware that we live in an earthquake-prone region.

This month will mark the 312th anniversary of the last major earthquake and resulting tsunami from the Cascadia Subduction Zone that sits off Oregon's coast. Throughout this year, OSSPAC will be drafting an Oregon Resilience Plan to help us better prepare for the next major earthquake and tsunami.

A focused resiliency effort can better prepare us for catastrophic disasters as well as help us weather our more common emergencies like storms, floods and fires. OSSPAC has had wide participation from state agencies, local governments, businesses and non-profits and I encourage their continued engagement on this critical effort.

Thank you for all of OSSPAC's efforts to date and for continuing to be a powerful voice for a more prepared and resilient Oregon.

Sincerely,

John A. Kitzhaber, M.D.
Governor

JAK/CS/ap



A RESOLUTION requesting that the Cascadia Region Earthquake Workgroup endorse Oregon State and Oregon Seismic Safety Policy Advisory Council in creating a more resilient state through their resiliency planning efforts in support of 2011 Oregon House Resolution 3 (Oregon Resiliency Planning).

WHEREAS, a Cascadia Subduction Zone generated earthquake and tsunami poses significant risk to life, property, the environment, and the regional economy, and

WHEREAS, the Cascadia Region Earthquake Workgroup, has a vision of a disaster resilient region, and

WHEREAS, the Cascadia Subduction Zone represents a common hazard in the Pacific Northwest and the shared risk that affect the Cascadia Region; and

WHEREAS, the Cascadia Region Earthquake Workgroup supports efforts to reduce vulnerability,

NOW THEREFORE,

BE IT RESOLVED BY THE BOARD OF DIRECTORS THAT:

The Cascadia Region Earthquake Workgroup is supportive of the goals and objectives identified in 2011 Oregon House Resolution #3; and

Resolved, that the Cascadia Region Earthquake Workgroup will provide support similar to that provided to Washington State Seismic Safety Committee's Resilient Washington State Initiative; and

Resolved, that the Cascadia Region Earthquake Workgroup will help promote the findings of resilience planning efforts from the Pacific Northwest to further reduce identified risks and improve seismic resilience.

Adopted by the Cascadia Region Earthquake Workgroup Board of Directors this 25th day of January, 2012, and signed by me in authentication of its adoption this 25th day of January, 2012.

A handwritten signature in black ink, appearing to be 'Cal Ok', is written over a horizontal line.

President of the Cascadia Region Earthquake Workgroup

Appendix II January 26, 2012 workshop



Oregon

John A. Kitzhaber, MD, Governor

Seismic Safety Policy Advisory Commission

Oregon Emergency Management

Mailing Address: PO Box 14370

Salem, OR 97309-5062

Phone: (503) 378-2911

Fax: (503) 373-7833

Oregon Resilience Planning Overview

Background

A Cascadia earthquake and tsunami has the potential to cause an unparalleled economic and human catastrophe for the State of Oregon because its impacts are region-wide. Over 40 great earthquakes of magnitude 8 and larger have struck Western Oregon during the last 10,000 years. The current calculation of a 37% conditional probability that a Cascadia earthquake will strike Oregon within the next 50 years means that it is now prudent to understand and take steps to mitigate this risk to our economy and to our businesses, homes, and communities.

In April 2011, the Oregon House of Representatives unanimously passed House Resolution 3 (sponsored by Rep. Deborah Boone, D-Cannon Beach), which directs Oregon Seismic Safety Policy Advisory Commission (OSSPAC) to “lead and coordinate preparation of an Oregon Resilience Plan that . . . makes recommendations on policy direction to protect lives and keep commerce flowing during and after a Cascadia (megathrust) earthquake and tsunami.” The Plan and recommendations are due to be delivered to the Oregon Legislative Assembly by February 28, 2013.

Richard A. Reed, President Obama’s Senior Director for Resilience Policy, and Oregon Governor John Kitzhaber have acknowledged our resilience planning efforts and have provided their endorsement.

Resilience

Resilience as defined in House Resolution 3 means that Oregon citizens will not only be protected from life-threatening physical harm, but that because of risk reduction measures and pre-disaster planning, communities will recover more quickly and with less continuing vulnerability following a Cascadia Subduction earthquake and tsunami. OSSPAC defines the Cascadia earthquake to be a Magnitude 9.0 Cascadia Subduction earthquake with an average recurrence of once every 500 years.

To achieve the goal of rapid recovery, we need arrangements in place for government continuity, resilient physical infrastructure, and business/economic continuity. Resilient physical infrastructure is the foundation.

Resilience Planning Objective and Methodology

Oregon Seismic Safety Policy Advisory Commission (OSSPAC) will lead and coordinate with government agencies, academia, business and professional communities to develop a comprehensive 50-year resiliency plan so that the state will become a resilient state by 2062. It will work with various government agencies and advisory bodies to collect available studies and reports and develop data as appropriate to:

- assess **conditions** of existing critical facilities and lifeline systems,
- evaluate **effectiveness** of current design and construction practices relative to earthquake resilience,
- develop **desired performance targets** (in terms of usability and timeframe required for the restoration of services) to meet resilience goals, and
- prepare **recommendations** for statewide policies and actions to achieve the desired performance targets.

We will utilize concepts and ideas developed for San Francisco by the San Francisco Planning + Urban Research Association (SPUR) and by the Resilient Washington State initiative in our neighbor to the north, and apply them to a statewide level. The final SPUR documents for the Resilient City project in San Francisco can be found at http://www.spur.org/resilient_city.

To promote communication with the general public and policy makers, we will strive to use language appropriate for a general audience and minimize use of highly specialized technical vocabulary when developing the resilience plan.

Resilience Planning Organizational Structure

Oregon Seismic Safety Policy Advisory Commission (OSSPAC) will be leading and coordinating the preparation of the plan through its Resilient Oregon Steering Committee. OSSPAC Steering Committee consists of five commissioners as follows:

Kent Yu (Chair, Public member/Structural)
Jay Wilson (vice Chair, Public member/local government)
Althea Rizzo (OEM, State Earthquake/Tsunami Manager)
Ian Madin (DOGAMI)
Stan Watters (Public member/Utilities)

As a state commission with limited staff and resources at its command, OSSPAC must depend on voluntary assistance from Oregon's government agencies, academic, business, and professional communities to complete this task. OSSPAC has assembled one Advisory Panel and eight task work groups that represent a broad cross section of contributors, including policy advisors, government officials, emergency/business continuity managers, professors, engineers, scientists, business representatives, sustainability practitioners and others.

Advisory Panel

OSSPAC will seek strategic advice from the Advisory Panel throughout the development of the resilience plan. Its makeup is also intended to augment OSSPAC's overall capabilities and broaden OSSPAC representation from government, legislature, geographic region, and business.

The Advisory Panel currently consists of

Cameron Smith (Public Safety Advisor to the Governor)
The Hon. Peter Courtney/Ryan Mann (Oregon Legislature)
JR Gonzalez (Oregon PUC)
Bruce Johnson (ODOT)
Ed Dennis (Oregon Dept. of Education)
Yumei Wang (NEHRP)
Onno Husing (Oregon Coastal Zone Management Assn.)
Nate Wood, Ph.D. (USGS)
Scott Ashford, Ph.D. (OSU)
Chris Goldfinger, Ph.D. (OSU)
Andre LeDuc (U of O)
Jeff Soulages (Intel)
Edward Wolf (Oregon citizen)
Leon Kempner (Regional/Bonneville Power Administration)
Don Lewis (DOGAMI)
Jean O'Connor (Oregon Health Authority)

Eight Task Groups

OSSPAC Steering Committee has established eight task groups to address the state's critical facilities and its energy, water/wastewater, transportation, and telecommunications systems, mitigate tsunami risk, and enhance business continuity. The state's Department of Geology and Mineral Industries (DOGAMI) will support our work with mapped depictions of Cascadia earthquake scenarios based on the best available science.

Eight task groups are listed below:

1. Magnitude 9.0 Earthquake/Tsunami Scenario led by Ian Madin (OSSPAC/DOGAMI)
2. Critical/Essential Buildings led by Ed Quesenberry and Trent Nagele (SEAO)
3. Energy led by Stan Watters (OSSPAC/Port of Portland) and JR Gonzalez (PUC)
4. Telecommunications led by Althea Rizzo (OSSPAC/OEM) and Mike Mumaw (OSSPAC/Beaverton)
5. Transportation (Highways + Bridges/Ports/Railroads) led by Bruce Johnson (ODOT)
6. Tsunami Risk Mitigation led by Jay Wilson and Jay Raskin
7. Water and Waste Water System led by Mike Stuhr (PWB) and Mark Knudson (TVWD)
8. Business Continuity led by Susan Steward (OSSPAC/BOMA) and Gerry Williams (OSSPAC)

*Physical location: 3225 State Street, Room 115, Salem, Oregon
9-1-1 SAVES. . .*

Magnitude 9.0 Earthquake/Tsunami Scenario Group will develop:

- Ground shaking intensity maps
- Tsunami Inundation maps
- Landslide and liquefaction maps

All other task groups will utilize the various maps developed to generate their resiliency plans. The task group makeup is expected to vary from one group to another due to the difference of the sectors. However, we expect each group to have at least one emergency manager, one engineer, and one business representative.

The Critical Building Task Group will address:

- Emergency Operations Centers
- Education facilities (K-12, College and University);
- Healthcare facilities (Hospitals and MOBs)
- Police and Fire Stations
- Critical government administration/services facilities
- Emergency sheltering facilities
- Community retail centers
- Financial/banking buildings
- Residential housing
- Vulnerable buildings (Un-reinforced masonry buildings and non-ductile concrete buildings)

The Energy Task Group will address the systems listed below:

- Electricity
- Natural Gas
- Liquid Fuel
- Alternative Energy – Solar, Wind and others
- Dams

The Telecommunications Task Group will address the systems listed below:

- Communication Network and Database
- Telecommunication Infrastructure

The Transportation Task Group will address the systems listed below:

- Bridges (owned by ODOT, Counties, or Cities)
- Airports and river and sea ports
- Railroads
- Mass Transit (Trimet)
- Columbia River

Tsunami Risk Mitigation Group will address the following:

- Tsunami evacuation
- Zoning and land use policy
- Critical facilities
- Re-building community
- Debris management

The Water and Wastewater Task Group will address the systems listed below:

- Drinking water storage, transmission, and distribution systems
- Wastewater collection systems and treatment plants

Interdependency issues among different lifeline sectors will be addressed through coordination of the steering committee and collaboration of Group leaders at a regular monthly meeting.

January 26, 2012 Kickoff Workshop

We will kick off the Oregon resiliency planning effort on January 26, 2012 (the 312th anniversary of the most recent Cascadia earthquake) at the Port of Portland.

We anticipate that the participants will get an overview of House Resolution 3 and the roadmap of the Oregon resilience plan, and learn about what Washington has accomplished with its Resilient Washington State initiative. During the breakout sessions, the leaders of each task group will facilitate and lead the discussion of the scope of their group, and work with their participants to develop action plans and schedules. Each task group will assign a designated participant to take notes, and the OSSPAC steering committee will assemble a final document based on information submitted by all workgroups. A second workshop will be scheduled in the fall of 2012 for each group to report their progress.

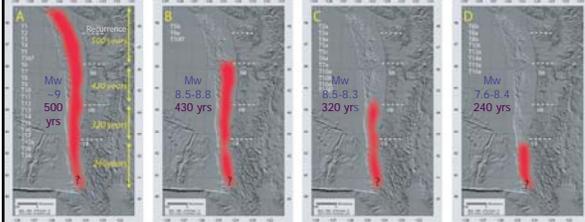


Oregon Resilience Planning Workshop

January 26, 2012
Port of Portland

Cascadia Subduction Zone Earthquakes

Turbidites show how much of the subduction zone ruptured in ~42 earthquakes over the last 10,000 years.



- 20 earthquakes ruptured all of the subduction zone.
- 2 to 3 earthquakes ruptured three quarters of subduction zone.
- 19 earthquakes ruptured the southern half or quarter of the subduction zone.

Acknowledgment

- ◆ Port of Portland for providing meeting venue
- ◆ CREW for sponsoring lunch
- ◆ Degenkolb for sponsoring morning coffee

Cascadia Earthquake Hazards and Risk



PACIFIC NORTHWEST

- ❑ Cascadia Subduction Zone
- ❑ 1994 – Oregon Building Code w/Seismic Design Provisions
- ❑ Interval 500 yrs for M9.0
- ❑ M9 on 1/26/1709

Seismic Concerns

- ◆ Progressive Government and community
- ◆ Unclear building performance
- ◆ Different standards for performance among different lifeline sectors
- ◆ Lack of inter-sector coordination
- ◆ Limited understanding by political leadership and the public of the potential performance of buildings and lifelines

House Resolution 3

70th OREGON LEGISLATIVE ASSEMBLY--2011 Regular Session

Enrolled House Resolution 3

Sponsored by Representative BOONE; Representatives COWAN, KRIEGER, ROBLAN, WITT, Senators COURTNEY, JOHNSON, KRUSE, VERGER, WHITSETT

- ◆ Protect citizens and businesses from shaking and tsunami
- ◆ Ensure rapid economic recovery

OSSPAC Mission

Broad Political Support

- ◆ Richard A. Reed, President Obama's Senior Director for Resilience Policy
- ◆ Oregon Governor John Kitzhaber
- ◆ State Agencies
- ◆ CREW, SEA0, ASCE, AIA
- ◆ Oregon businesses and local government
- ◆ Academia
- ◆ Neighbors, Friends and Colleagues

OSSPAC

- ◆ 18 members appointed by Governor
- ◆ Six representatives of government (Bldg Codes, DOGAMI, DLCD, OEM, ODOT, DOE)
- ◆ Six representatives of public interest (Legislature, Red Cross etc.)
- ◆ Six representatives of industry and stakeholders (Struct., Banking, local govern., multi-family, Bldg Owner, Utilities)
- ◆ The mission of OSSPAC is to increase or improve:
 - 1) earthquake awareness, education and preparedness;
 - 2) earthquake risk information;
 - 3) the earthquake safety of buildings and lifelines;
 - 4) geoscience and technical information; and
 - 5) emergency pre-disaster planning, response and recovery efforts

◆ <http://www.oregon.gov/OMD/OEM/osspace/osspace.shtml>

Agenda

Time	Event	Presenter
9:00 a.m.	Greeting and Introduction	Kent Yu, OSSPAC Chair Cale Ash, CREW President
9:20 a.m.	Introduction into Resiliency Planning in Oregon	General Caldwell/OR OEM, Rep. Deb Boone
9:40 a.m.	OSSPAC Mission Summary of House Resolution 3	Kent Yu
10:00 a.m.	Framework for Oregon Disaster Resiliency Plan	Kent Yu Jay Wilson, OSSPAC Vice-Chair
BREAK		
10:45 a.m.	Washington State Disaster Resiliency Plan	John Schelling, WA EMD
11:00 a.m.	Orientation of Task Force Break out groups	Althea Rizzo, OR OEM Jay Wilson
12:00 a.m.	LUNCH	
12:20 p.m.	Task Group Work Sessions	Pick up lunches Facilitated by Task Group leads
BREAK		
2:45 p.m.	Task Group Briefings (5 minutes per group)	Presented by Task Group leads
3:00 p.m.	Next steps	Kent Yu
3:45 p.m.	End Workshop	

Oregon's Seismic Safety Legislation

- ◆ 2001 law "life safety" in schools by 2032
- ◆ 2002 Ballot Measure 15 amended Constitution: allows bonds to fix schools
- ◆ 2005 4 Bills (2007 schools report on web)
- ◆ 2007 Funds & staff establish grant program
- ◆ 2009 Seismic Retrofit Grant program
 - \$30 M (\$15M schools, \$15M emergency response facilities)
- ◆ 2011 Cascadia Resilience Planning

Y.Wang

House Resolution 3

- ◆ Directs (OSSPAC) to “lead and coordinate preparation of an Oregon Resilience Plan that . . . makes recommendations on policy direction to protect lives and keep commerce flowing during and after a Cascadia (megathrust) earthquake and tsunami.”
- ◆ The Plan and recommendations to be delivered to the Oregon Legislative Assembly by February 28, 2013.

Resilience Planning Objective and Methodology

HR3 Resilience Definition

- ◆ Protect Citizens from physical life-threatening harm (from Earthquake and Tsunami)
- ◆ Community recover rapidly with less vulnerability through mitigation and pre-disaster planning
- ◆ Cascadia Earthquake is M9.0 with average 500 years return.

Resilience Planning Objective

- ◆ Look at 50-year time window
- ◆ Develop a comprehensive plan so that state is resilient by 2062
- ◆ Utilize concepts and ideas by SF Planning + Urban Research Association and from Resilient Washington Initiative

HR 3 Resilience Definition

- ◆ To Achieve Rapid Recovery, Require Government Continuity, Resilient Physical Infrastructure, Business Continuity
- ◆ Resilient Physical Infrastructure is the foundation

How Much Damage Can a City Endure?



Chile - 2010

New Zealand - 2011

The Resilient City

- A Resilient City can take “the Punch” of an event and through preparedness and the impromptu response of those affected, and recover quickly.
- Goal: Save the people, their neighborhoods, their cultural heritage and their local economy
- Resilience is sustainable

Transparent Hazard Definitions for the Region

Category	Hazard Level
Routine	Likely to occur routinely in the region (50/50)
Expected	Reasonably expected to occur once during the useful life of a structure or system (10/50, 500)
Extreme	Reasonably be expected to occur on a nearby fault (2/50, 2500)

SPUR Approach:

- Define concept of **resilience** in the context of disaster planning and recovery
- Establish **performance goals** for the “expected” earthquake that supports the definition of resilience
- Define transparent **performance measures** that help reach the performance goals
- Make **Recommendations** for new buildings, existing buildings and lifelines

Transparent Performance Measures for Buildings

Category	Performance Standard
Category A	Safe and operational: Essential facilities such as hospitals and emergency operations centers
Category B	Safe and usable during repair: “shelter-in-place” residential buildings and buildings needed for emergency operations
Category C	Safe and usable after repair: current minimum design standard for new, non-essential buildings
Category D	Safe but not repairable: below standard for new, non-essential buildings. Often used as a performance goal for existing buildings undergoing voluntary rehabilitation
Category E	Unsafe – partial or complete collapse: damage that will lead to casualties in the event of the “expected” earthquake - the killer buildings

Performance Goals for the “Expected” Earthquake

Phase	Time Frame	Condition of the built environment
I	1 to 7 days	Initial response and staging for reconstruction
II	7 to 60 days	Workforce housing restored – ongoing social needs met
III	2 to 36 months	Long term reconstruction

Lifelines and workforce are the key elements

Seismic Performance Life Safe and Operational



Seismic Performance Life Safe and Usable During Repair

Seismic Performance Unsafe (Collapse)

Seismic Performance Life Safe and Useable after Repair

Transparent Performance Measures for Lifelines

Category	Performance Standard
Category I	Resume 100% service within 4 hours
Category II	Resume 90% service within 72 hours 95% within 30 days 100% within 4 months
Category III	Resume 90% service within 72 hours 95% within 30 days 100% within 3 years

Seismic Performance Life Safe but not repairable

Target States of Recovery for Building & Infrastructure

Phase	Time Frame	Focus of Attention
I	1 to 7 days	Initial response and staging for reconstruction

EOC's,
City Buildings,
Hospitals,
Police and Fire Stations,
Shelters

Building Category A: "Safe and Operational"
Life Line Category I: "Resume essential service in 4 hours"

Target States of Recovery for Building & Infrastructure

Phase	Time Frame	Focus of Attention
II	7 to 30 days	Workforce housing restored – ongoing social needs met

Residential structures,
Schools,
Community retail centers,
Doctors offices



Building Category B: "Safe and usable while being repaired"
Life Line Category II: "Resume 100% workforce service within 4 months"

Oregon Resilience Planning Organizational Structure

Target States of Recovery for Building & Infrastructure

Phase	Time Frame	Focus of Attention
III	2 to 36 months	Long term reconstruction

Industrial Buildings
Commercial buildings
Historic buildings



Building Category C: "Safe and usable after repair"
Life Line Category III: "Resume 100% commercial service within 36 months"

Overall Structure

- ◆ OSSPAC
- ◆ OSSPAC Steering Committee
- ◆ Advisory Panel
- ◆ Eight Workgroups

Oregon Resilience Planning Steps

- ◆ assess **conditions** of existing critical facilities and lifeline systems,
- ◆ evaluate **effectiveness** of current design and construction practices relative to earthquake resilience,
- ◆ develop **desired performance targets** (in terms of usability and timeframe required for the restoration of services) — to meet resilience goals, and
- ◆ prepare **recommendations** for statewide policies and actions to achieve the desired performance targets.
- ◆ Recommendations will be prepared in plain, layman language.

OSSPAC Steering Committee

- ◆ Kent Yu (Chair, Public member/Structural)
- ◆ Jay Wilson (vice Chair, Public member/local government)
- ◆ Althea Rizzo (OEM, State Earthquake/Tsunami Manager)
- ◆ Ian Madin (DOGAMI)
- ◆ Stan Watters (Public member/Utilities)

Advisory Panel

- ◆ Cameron Smith (Public Safety Advisor to the Governor)
- ◆ The Hon. Peter Courtney/Ryan Mann (Oregon Legislature)
- ◆ JR Gonzalez (Oregon PUC)
- ◆ Bruce Johnson (ODOT)
- ◆ Ed Dennis (Oregon Dept. of Education)
- ◆ Yumei Wang (NEHRP)
- ◆ Onno Husing (Oregon Coastal Zone Management Assn.)
- ◆ Nate Wood, Ph.D. (USGS)
- ◆ Scott Ashford, Ph.D. (OSU)

Earthquake/Tsunami Group

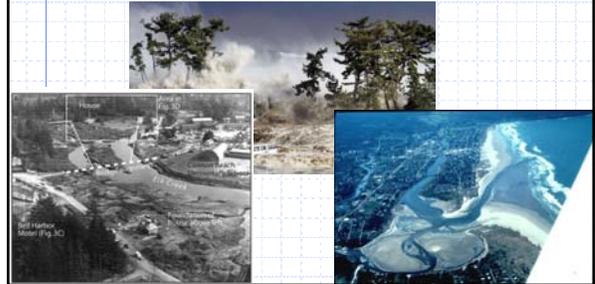
- ◆ Led by Ian Madin (DOGAMI)
- ◆ Magnitude 9.0 Earthquake/Tsunami Scenario Group will develop:
 - 1) Ground shaking intensity maps
 - 2) Tsunami Inundation maps
 - 3) Landslide and liquefaction maps

Advisory Panel (continued)

- ◆ Chris Goldfinger, Ph.D. (OSU)
- ◆ Andre LeDuc (U of O)
- ◆ Jeff Soulages (Intel)
- ◆ Edward Wolf (Oregon citizen)
- ◆ Leon Kempner (Regional/Bonneville Power Administration)
- ◆ Don Lewis (DOGAMI)
- ◆ Jean O'Connor (Oregon Health Authority)

Strong Shaking and Tsunami

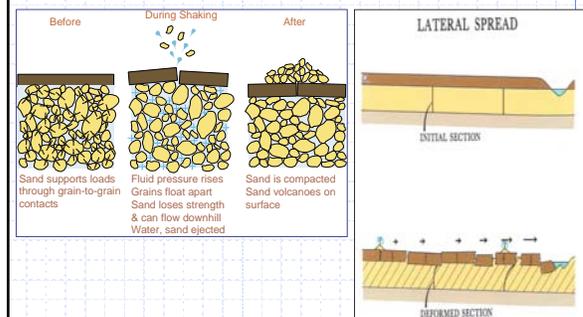
- Strong Ground Shaking (M9 w/ 3 min shaking)
- Tsunami within 25 minutes



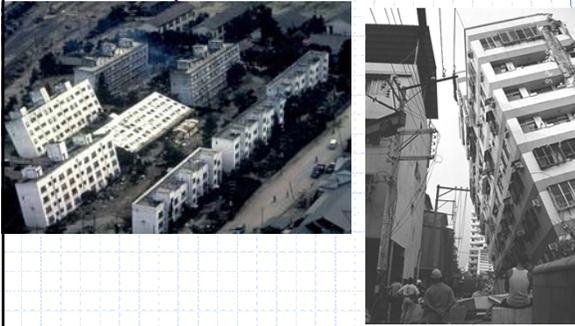
Eight Workgroups

- ◆ Magnitude 9.0 Earthquake/Tsunami Scenario
- ◆ Critical/Essential Buildings
- ◆ Energy
- ◆ Telecommunications
- ◆ Transportation
- ◆ Tsunami Risk Mitigation
- ◆ Water and Waste Water Systems
- ◆ Business Continuity

Liquefaction & Lateral Spreading

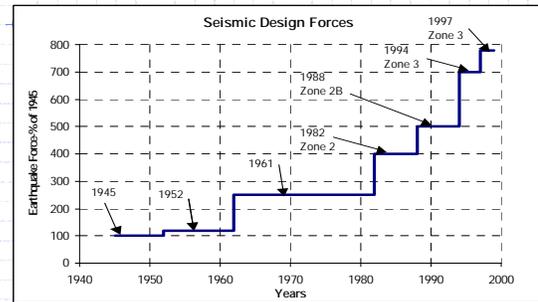


Liquefaction



Source: EERI, 2001

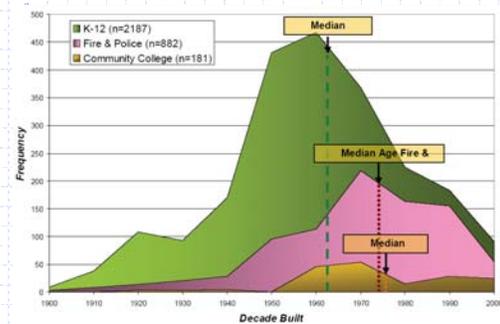
Lateral Load: Increased Seismic



Lateral Spreading



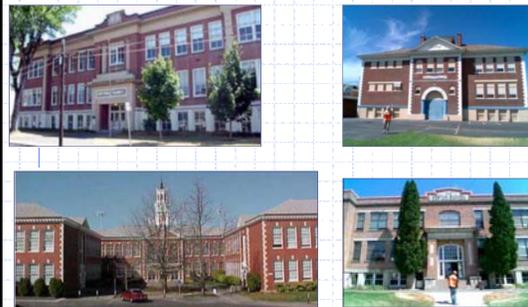
Oregon Education and Emergency Facilities



Critical Building Group

- ◆ Led by Ed Quesenberry and Trent Nagele (SEAO)
- ◆ The Critical Building Task Group will address the buildings listed below:
 - Emergency Operations Centers
 - Education facilities (K-12, College and University);
 - Healthcare facilities (Hospitals and MOBs)
 - Police and Fire Stations
 - Critical government administration/services facilities
 - Emergency sheltering facilities
 - Community retail centers
 - Financial/banking Buildings
 - Residential Housing
 - Killer buildings (URM and non-ductile RC buildings)

URMs and Non-ductile Concrete



Energy Group

- ◆ Led by Stan Watters (OSSPAC/Port of Portland) and JR Gonzalez (PUC)
- ◆ The Energy Task Group will address the systems listed below:
 - Electricity
 - Natural Gas
 - Liquid Fuel
 - Alternate Energy – Solar, Wind and others
 - Dams

Transportation Group

- ◆ Led by Bruce Johnson (ODOT)
- ◆ The Transportation Task Group will address the systems listed below:
 - Bridges (owned by ODOT, Counties or Cities)
 - Airports and Seaports
 - Railroads
 - Mass Transit (Trimet)
 - Columbia River

Energy: Liquid Fuel, Electrical Systems



(Credit: Yumei Wang)

Tsunami Risk Mitigation Group

- ◆ Led by Jay Wilson/Jay Raskin
- ◆ Tsunami Risk Mitigation Group will address the following:
 - Tsunami evacuation
 - Zoning and Land use policy
 - Critical facilities
 - Re-building community
 - Debris management

Telecommunications Group

- ◆ Led by Mike Mumaw (OSSPAC/Beaverton) and Althea Rizzo (OSSPAC/OEM)
- ◆ The Telecommunication Task Group will address the systems listed below:
 - Communication Network and Database
 - Telecommunication Infrastructure

Water and Waste Water Group

- ◆ Led by Mike Stuhr (PWB) and Mark Knudson (TVWD)
- ◆ The Water and Wastewater Task Group will address the systems listed below:
 - Water storage, transmission, and distribution systems
 - Wastewater collection systems and treatment plants

Water and Wastewater



Project Schedule

Business Continuity Group

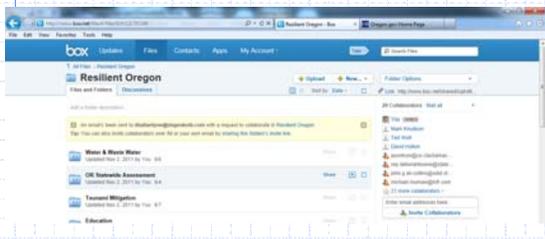
- ◆ Led by Susan Stewart (BOMA) and Gerry Williams (OSSPAC)
- ◆ Goals:
 - ◆ Raise Earthquake/Tsunami Awareness
 - ◆ Gauge Earthquake/Tsunami Preparedness
 - ◆ Gather input/ideas from Business for other workgroups to improve resilience plan

Project Schedule

- ◆ 100% Completion on February 2013
- ◆ 90% completion in December
- ◆ 75% completion in September 2012 (2nd Workshop)
- ◆ 45% completion in June 2012
- ◆ 15% completion in March 2012
- ◆ Kickoff workshop in January 2012 (Today)
- ◆ Initial Planning (11/2011 thru 1/12)

Oregon Resilience Planning Platform

- ◆ Virtual team with modern communication
- ◆ Online collaboration platforms (Box, Dropbox, Evernote...)



Next Steps

Next Steps

- ◆ Apply for funding in February 2012
- ◆ Special OSSPAC on February 21, 2012
- ◆ Invite Group Leaders to OSSPAC Meeting to discuss inter-dependency issues.

Reach Out

Thank You

**Resiliency Planning Task Groups
Work Session Orientation**

January 26, 2012

Jay Wilson
OSSPAC, Vice Chair

QuickTime™ and a decompressor are needed to see this picture.

Oregon Seismic Safety Policy Advisory Commission

**Resiliency Planning Task Groups
Work Session Orientation**

- How will the “final” document be synthesized and condensed from the work products produced from each group?
- A professional writer will work with each committee to develop the final report that will synthesize all of the different parts to form a unified document.

OSSPAC

**Resiliency Planning Task Groups
Work Session Orientation**

- Work sessions will be facilitated by team leads.
- Each group will have topics to initiate discussion at this breakout session.
- Session will be about 2 hours long.

OSSPAC

**Resiliency Planning Task Groups
Work Session Orientation**

- Will there be a uniform work product format that each group will be working from?
- OSSPAC Steering Committee will develop a template of specific issues that each committee must address as part of their work.
- The template will be used to maintain consistency of mission and format between committees.
- Mid year will be a 50% deadline.

OSSPAC

Task Groups and Leads

MAGNITUDE 9.0 EARTHQUAKE/Tsunami SCENARIO
led by Ian Madin (OSSPAC/DOGAMI)

CRITICAL/ESSENTIAL BUILDINGS
led by Ed Quesenberry and Trent Nagele (SEAO)

ENERGY
led by Stan Watters (Port of Portland) and JR Gonzalez (PUC)

TELECOMMUNICATIONS
led by Althea Rizzo (OEM) and Mike Mumaw (Beaverton)

TRANSPORTATION (HIGHWAYS + BRIDGES/PORTS/RAILROADS)
led by Bruce Johnson (ODOT)

TSUNAMI RISK MITIGATION
led by Jay Wilson/Jay Raskin

WATER AND WASTE WATER SYSTEM
led by Mike Stuhr (PWB) and Mark Knudson (TVWD)

BUSINESS CONTINUITY
led by Susan Steward (BOMA) and Gerry Williams (OSSPAC)

OSSPAC

**Resiliency Planning Task Groups
Work Session Orientation**

- Will we have access to administrative resources or other (State?) personnel to assist?
- There is no current funding for this effort. FEMA is going to be approached for assistance, but for now, each committee will be responsible for handling these responsibility as volunteers.

OSSPAC

Resiliency Planning Task Groups Work Session Orientation

- Are there funds/budget available? - Not yet.
- Other resources available and/or funds for reimbursable expenses (communication/conferencing, mailing, printing, travel, etc.) Kent Yu to investigate ways to obtain funding for reimbursement.
- Each committee will be directed to keep track of reimbursable expenses in the event that funding is found.

OSSPAC

Assigned Workgroups Business Roundtable

led by Susan Steward (BOMA) and Gerry Williams (OSSPAC)

Angell,	Townsend
Chamberlain,	Lori
Dodler,	John E.
Haapala,	Kurt
Herrenbruck,	Greg
Hynes,	Pat
O'Connor,	Jean
Reuter,	Scott
Sakamoto,	Ruby
Schamma,	Danny R.
Schwinghammer,	Michael
Shugrue,	Terry
Soulages,	Jeffery R.
Steidel,	Sam
Trimpler,	Sally
Van Dyke,	Rick
Ward,	Bryce
Weston,	Jim
Rodgers,	Mathew

OSSPAC

Box.net management

- Each Committee will have their own folder on Box.net.
- Each Committee will be responsible for maintaining the contents of their folder and keeping everything up to date.

OSSPAC

Assigned Workgroups Critical/Essential Buildings

led by Ed Quesenberry and Trent Nagele (SEAO)

Barbosa, André R.	
Bugni,	David
Duquette,	Shelley
Eggers,	Jennifer
Gehlen,	Joe
Johnson, Robert	
Kaplan,	Kevin
Monnier, Anne	
Richards, Josh	
Rippey,	Tim
Rogers,	Richard S.
Wolf,	Edward
Halog,	Tonya
Kumar,	Amit

OSSPAC

Resiliency Planning Task Groups Work Session Orientation

Oregon Public Meeting Law

Task Group leads should work closely with OSSPAC staff to meet State Requirements for proper notification of public meetings.

<http://www.oregon.gov/OMD/OEM/ossprac/ossprac.shtml>

ORS regarding public notice states "a reasonable time" of notice must be given, and special meetings just have to give at least 24 hours' notice.

A Bill was recently passed regarding posting all public meeting notices on The State's new "Transparency" state website. It lists all boards and commissions and all meetings. See link below.

http://www.oregon.gov/transparency/PublicMeetingNotices.shtml#Meeting_List_View

OSSPAC

Assigned Workgroups Energy

led by Stan Watters (Port of Portland) and JR Gonzalez (PUC)

Carter,	Rick
Ford,	Dave
Gonzales,	JR
Guerra,	Debbie
Wang,	Yumei
Watters, Stan	
Kempner Jr.,	Leon
Ridenhour,	Randy
Vranish,	Jack
Wilson,	Zamora
Karney,	Joe
Kuehnel, Andrea	
Plechinger,	John

OSSPAC

Assigned Workgroups
Telecommunications

led by Althea Rizzo (OEM) and Mike Mumaw (Beaverton)

Lumbard, Rizzo, Stember, Kelley	Devon Althea
---------------------------------------	-----------------

OSSPAC

Assigned Workgroups
Water and Waste Water

led by Mike Stuhr (PWB) and Mark Knudson (TVWD)

Ballantyne, Damewood, Doane, Knudson, Leon, Newell, Patterson, Perimon, Phelps, Schab, Stahl,	Don Mel James Mark Arturo Jim Sherry Todd Brad Rob Brian
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OSSPAC

Assigned Workgroups
Transportation and Highways

led by Bruce Johnson (ODOT)

Ashford, EK-Collins, Libby, Merio, Nako, Totten, Mabey,	Scott Greg Mark Carmen Albert Craig Matthew
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OSSPAC

Assigned Workgroups
Tsunami Risk Mitigation

led by Jay Wilson (OSSPAC) and Jay Raskin (AIA)

Boone, Howard, Lucker, Raskin, Wilson,	Debbie Michael Stephen Jay Jay
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OSSPAC

The Resilient Washington State Initiative

OSSPAC Meeting
January 26, 2012



Background

- The Resilient Washington State Initiative project is based upon the San Francisco Urban Planning and Research Association (SPUR) Report, entitled “*The Resilient City*”, which examines the current state of resilience to a scenario quake in San Francisco.
- Initial report includes 4 major policy sections - Defining Resilience, The Dilemma of Existing Buildings, Building it Right the First Time, and Lifelines.
- Three subsequent reports released during the course of the RWS project.

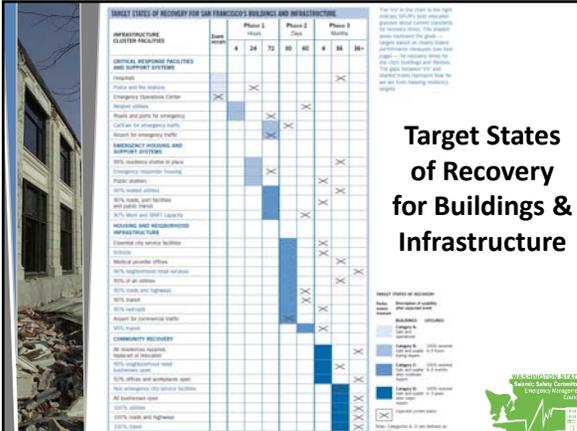


Presentation Overview

- Project Background
- “The Resilient Washington State Initiative”
- Project Approach & Preliminary Results
- A few early lessons learned... some considerations for Oregon



Target States of Recovery for Buildings & Infrastructure



The chart shows recovery phases for categories like Infrastructure, Critical Response Facilities, Emergency Housing, Housing and Rehabilitation, and Community Recovery. Phases include Immediate, 24 hours, 72 hours, 30 to 60 days, and Several years.



So, what is the “Resilient Washington State Initiative”?



Incorporate Transparent Performance Measures



The table defines stages of disaster recovery from 1 to 9, detailing timeframes and conditions for infrastructure, housing, and community recovery.

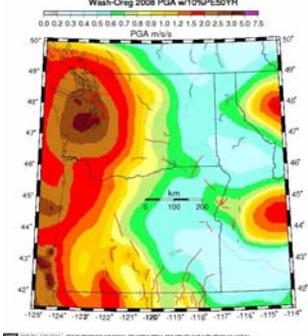


Resilient Washington State

- **Purpose** - Provide a framework for improving Washington's resilience when earthquakes occur.
 - Framework includes more effective seismic mitigation policies and recommendations for legislation and policy changes to improve and enhance statewide seismic safety.
- **Timeframe** – Goal of making the state resilient in 50 years.
 - Implementation plan by short-, mid-, long-term



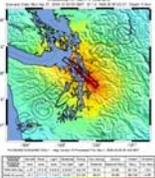
Resilient Washington State




Resilient Washington State

Earthquake Hazard:

- Not possible to define single EQ scenario at a State level.
- Identified a suite of scenarios from the 20 scenario earthquakes developed in 2009 by personnel from the WA EMD, WA DNR, USGS, and FEMA for use in planning efforts.




So, what *IS* resilience?



Resilient Washington State

Earthquake Hazard:

- M7.2 Seattle Fault, M7.4 Southern Whidbey Island Fault, M7.1 Tacoma Fault, M7.3 Saddle Mountain Fault, M6.8 Cle Elum Fault, and M9.0 Cascadia.
- Scenarios define geographic area of impact.
- Consider Ground Motions consistent with USGS 10/50 PGA maps.



Defining Resilience

- SPUR uses engineering standards –how many building demolitions (or infrastructure failures), and how long a recovery time for various levels of EQ.
- Resilience as a disaster, but not a catastrophe.
- Ability to recover – govern, lifelines to resume in short time frame, people stay in homes, resume normal living routine in weeks and return to new “normal” in few years.





RWS Definition of Resilient State

- **A resilient state is one that maintains services and livelihoods after an earthquake. In the event that services and livelihoods are disrupted, recovery occurs rapidly with minimal social disruption and results in a new and better condition.**




RWS Definition of Resilient State

- Environmental Protection – The natural resources and ecosystems of Washington State should be managed in such a way as to minimize earthquake-induced damage. This includes the use of proper growth management, accident response capacity, and industrial safety measures.




RWS Definition of Resilient State

- Property Protection – Public and private property within the State of Washington should be built, retrofitted, or rebuilt to minimize earthquake-induced damage. This includes proper design and construction of both structural and non-structural elements.




RWS Definition of Resilient State

- Life Safety and Human Health – Residents of the State of Washington should not suffer life-threatening injuries from earthquake-induced damage or develop serious illness from lack of emergency medical care after an earthquake. This includes enforcing and updating building codes, eliminating non-structural hazards, and ensuring continuity of emergency health care.




RWS Definition of Resilient State

- Economic Security – Residents and businesses within the State of Washington should have access to income opportunities to meet basic needs before and soon after an earthquake. This includes sufficient employment opportunities, market access, distribution capacity, and supplier access.




RWS Definition of Resilient State

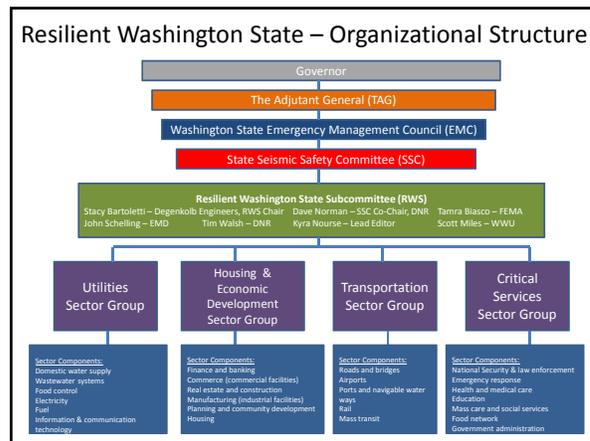
- Community Continuity – All communities within the State of Washington should have the capacity to maintain their social networks and livelihoods after an earthquake disaster. This includes prevention of social-network disruption, social discrimination, and community bias.



Overall Project Approach

- Established RWS Subcommittee under WA SSC
- Reviewed existing information and incorporated new data from the USGS/ DNR/EMD Scenario Catalog Project as a starting point.
- Hosted a workshop engaging key stakeholders and local jurisdictions in the process.
 - A truly Resilient State is made up of Resilient cities, counties, & tribes - local jurisdictions can adopt this approach (i.e. San Francisco model) at a smaller scale.





Overall Project Approach (cont.)

- Conducted an online survey of subject matter experts to help identify current capabilities
- Established formal Sector Groups with subject matter expert co-leads to facilitate information gathering from key partners and obtain buy in.
 - Sector Groups work independently using common guidance
- Hosted a follow-up workshop to deconflict results and review interdependencies
- RWS Subcommittee provides report



Resilient Washington State

Objectives of Sector Groups:

- Evaluate the current condition Sector and assess how quickly they can be restored.
- Develop targets for the desired restoration time frame.
- Define the vulnerabilities and key interdependencies.
- Prepare recommendations for statewide action to achieve desired targets.

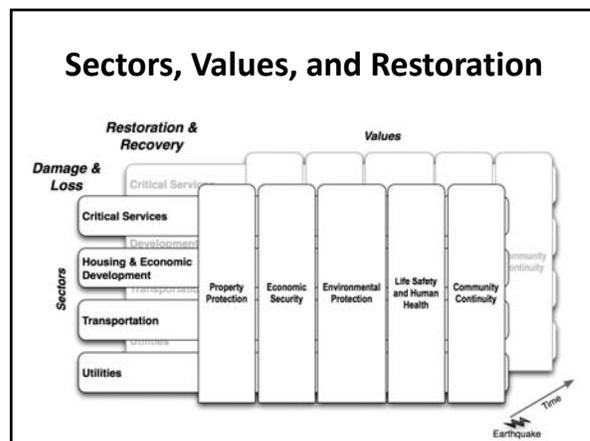


Resilient Washington State Sectors

- Critical services
- Housing and economic development
- Transportation
- Utilities

Each **sector** is comprised of multiple possible **components**

Each **sector** has different **restoration** capacity & targets with respect to each RWS **value**



Resilient Washington State

Process and Timing:

- 2009 – RWS Committee Formed
- 2010 – RWS Committee Developed Framework
- 9/17/2010 – Stakeholder Workshop to form Sector Groups
- 12/2/2011 – Concluding Workshop
- Q1 2012 – Draft Report
- Q2 2012 – Final Report



- Questions?



A few early lessons learned:

- Planning for multiple scenarios at a state level is TOUGH!
 - Consider examining one at a time
 - Leverage FEMA-State Cascadia planning process & data
- Tables as tools, not products
 - Consider having a starting draft and have the experts ‘tell you where you’re wrong’ to keep out of the weeds
- Mitigation vs. Response
 - Interconnected, but what is your goal? Which one is the priority for your planning?



So, what does ‘being resilient’ mean to Oregon?

Registration for Jan 26, 2012 Workshop

Lname	Fname	Affiliation
1 Angell	Townsend	Reed College
2 Ashford	Scott	OSU
3 Ballantyne	Donald	Degenkolb Engineers
4 Barbosa	André R.	OSU
5 Barrett	Denise A.	Portland Bureau of Emergency Management
6 Behrandt	Steve	City of Portland - BES
7 Bela	James	Oregon Earthquake Awareness
8 Boone	Deborah	Oregon House of Representatives
9 Bugni	David	David Bugni & Associates
10 CARTER	Rick	Oregon Public Utility Commission
11 Caswell	Heide	PacifiCorp
12 Chamberlain	Lori	Oregon Bankers Association
13 Damewood	Mel	Eugene Water & Electric Board
14 Dennis	Ed	OR Dept of Education
15 Dills	Kimberly	OHA/CDC
16 Doane	James	Public member
17 Dodier	John E.	Portland VA Medical Center
18 Downing	Shane	OR Army National Guard
19 Duquette	Shelley	City of Portland
20 Eggers	Jennifer	Degenkolb Engineers
21 EK-Collins	Greg	Oregon Department of Transportation
22 Estenes	Patrick	The Standard Insurance Company
23 Ford	Dave	Portland General Electric
24 Gehlen	Joe	Kramer Gehlen
25 Gonzale	JR	PUC
26 Guerra	Debbie	Pacific Power
27 Haapala	Kurt	AIA President
28 Halog	Tonya	J.G. Pierson
29 Herrenbruck	Greg	New Seasons Market
30 Howard	Michael	Oregon Partnership for Disaster Resilience
31 Hynes	Pat	Knife River Prestress Division
32 Johnson	Robert	Johnson Broderick Engineering, LLC
33 Kaplan	Kevin	VLMK
34 Karney	Joe	NW Natural
35 Kempner Jr.	Leon	Bonneville Power Administration
36 Knudson	Mark	Tualatin Valley Water District
37 Kuehnel	Andrea	NW Natural
38 Kumar	Amit	City of Portland BDS
39 Le Duc	Andre	UO
40 Leon	Arturo	Oregon State University
41 Libby	Mark	HDR Engineering, Inc.
42 Lucker	Steve	Oregon Dept. of Land Conservation and Development
43 Lumbar	Devon	Degenkolb Engineers
44 Maass	Matthew	Oregon Dept of Aviation
45 Mabey	Matthew	Oregon Dept. of Transportation
46 Madin	Ian	DOGAMI/OSSPAC
47 Male	James	University of Portland
48 Merlo	Carmen	Portland Bureau of Emergency Management
49 Monnier	Anne	KPFF Consulting Engineers
50 Mumaw	Michael	OSSPAC/ City of Beaverton Emergency management
51 Nagele	Trent	VLMK
52 Nako	Albert	Oregon Department of Transportation - Bridge Section
53 Newell	Jim	Degenkolb
54 O'Connor	Jean	Oregon Heath Division
55 Patterson	Sherry	Board Member, Rivergrove Water District, Lake Grove FD

56 Paul	Willy	Kaiser Permanente
57 Perimon	Todd	AECOM
58 Phelps	Brad	CH2M
59 Plechinger	John	Pacific Power
60 Pynch	Allison	American Society of Civil Engineers Technical Committee on Lifeline Earthquake Enginee
61 Quesenberry	Ed	Equilibrium Engineers LLC
62 Raskin	Jay	Ecola Architects, PC
63 Reuter	Scott	Oregon VOAD
64 Richards	Josh	KPFF
65 Ridenhour	Randy	Bonneville Power Administration
66 Rippey	Tim	TM Rippey Consulting Engineers
67 Rizzo	Althea	Oregon Emergency Management
68 Rodgers	Mathew	OSU Emergency Management
69 Rogers	Richard S.	Oregon Building Codes Division
70 Schab	Rob	Coos Bay/North Bend Water Board
71 Schamma	Danny R.	Liberty Northwest
72 Schwinghammer	Michael	Wells Fargo
73 Shugrue	Terry	Turner
74 Soulages	Jeffery R.	Intel
75 Spangler	Matthew	DLCD/OCMP
76 Stahl	Brian R.	City of Gresham, OR
77 Steidel	Sam	Cannon Beach
78 Stember	Kelley	Sprint Nextel
79 Steward	Susan	BOMA Oregon
80 Stuhr	Michael	Portland Water Bureau
81 Subramanian	Laxman	Standard Insurance Company
82 Thompson	Jason	KPFF
83 Totten	Craig	KPFF CONSULTING ENGINEERS
84 Trimpler	Sally	Bank of America
85 Van Dyke	Rick	Cambia Health Solution
86 Vranish	Jack	PacifiCorp
87 Wang	Yumei	DOGAMI (NEHRP)
88 Ward	Bryce	Econorthwest
89 Watters	Stan	Port of Portland
90 Weston	Jim	PeaceHealth Sacred Heart
91 Wieber	Michael	NW Seismic Retrofit
92 Williams, Jr.	Gerald H.	Construction Research, Inc.
93 Wilson	Zamora	NW Natural
94 Wilson	Jay	Vice-Chair, OSSPAC
95 Winchester	Jeffery R.	City of Salem
96 Wolf	Edward	Member, Advisory Committee on Long-Term Facilities Planning, Portland Public Schools
97 Woolley	Iaren	DLCD/OCMP
98 Yu	Kent	Chair, OSSPAC

Did not attend but expressed interest

Johnson	Gwynn R.	Portland State University
Swecker	Mitch	Director, Oregon Department of Aviation
Cruz	Tony	Worksafe Technologies
Newnam	Al	Ore. Dept. of Community Colleges and Workforce Development
Little	Christie	
Sieck	Cliff	Hewlett Packard Co.
MCCULLOUGH	NASON J.	CH2M HILL
Ianni	Francisco	Director of Preparedness, American Red Cross

contact for interest

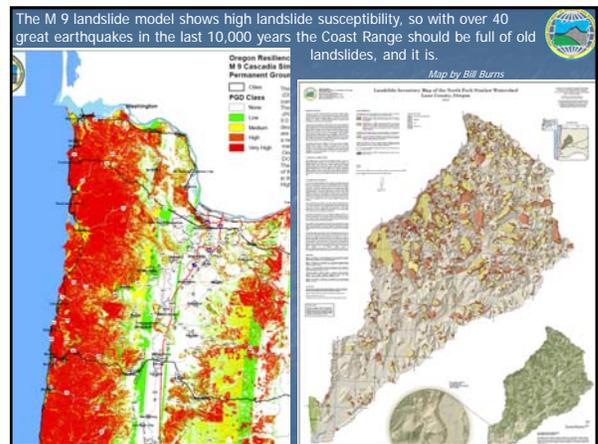
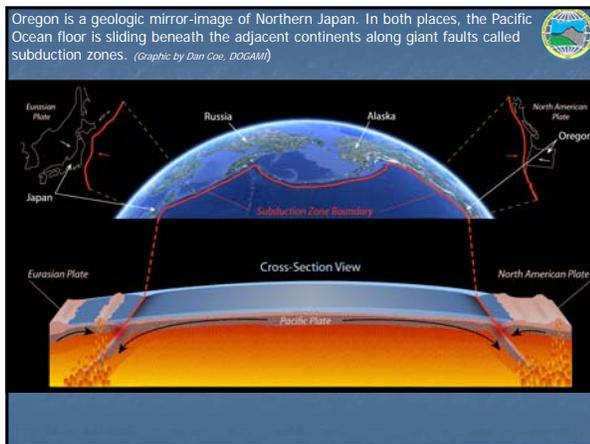
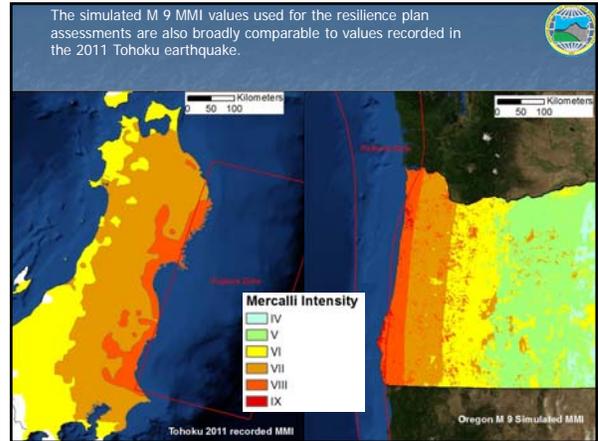
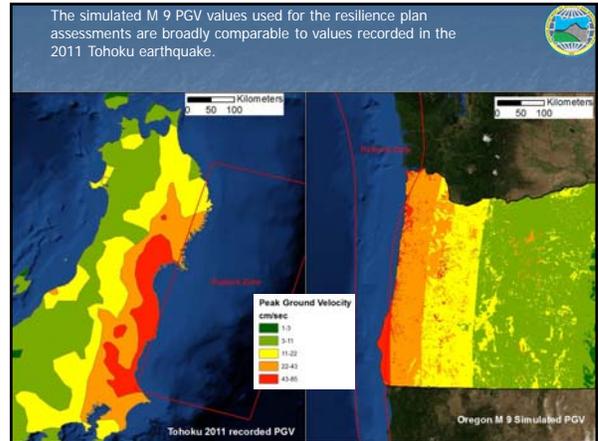
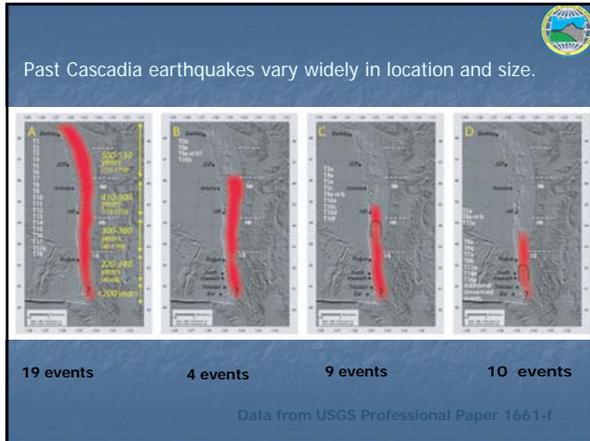
Floyd	Anita	CenturyLink
Trullinger	Ron	CenturyLink

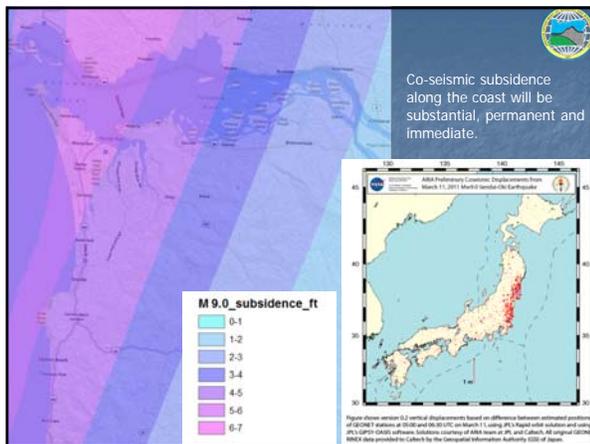
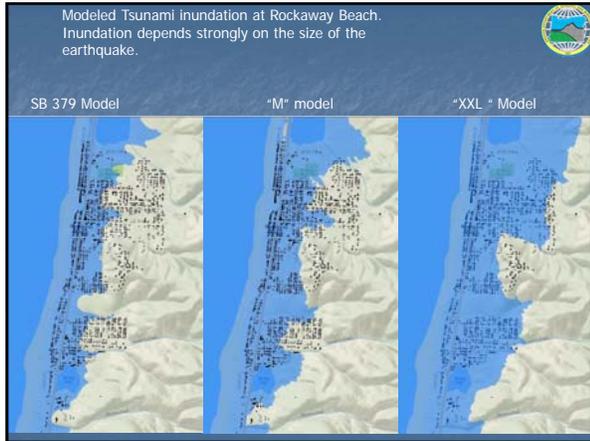
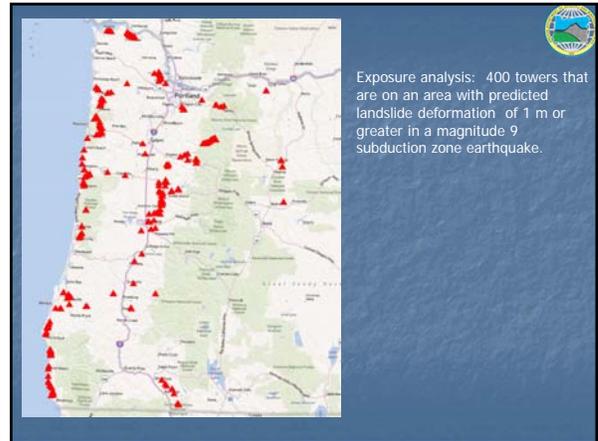
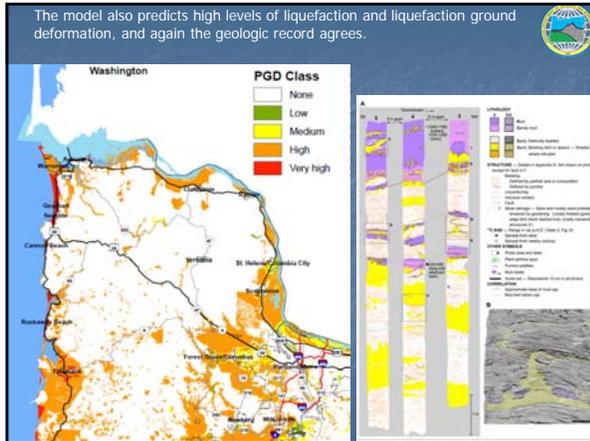
Cooley
Mulder
Willer
Murray
Wolf

Doug
Joe
Renee
Cathy
Brant

Comcast
Comcast
Frontier Communications
Integra Telecom
Oregon Telecommunications Association

Appendix III October 5, 2012 Workshop





Business/Community Continuity

Business/Community Continuity

Transportation and Utilities*

Transportation (highways, rail, light rail, bus, ports and airports: 7

Utility systems (potable and wastewater, natural gas, oil, electric power and communications: 6

Highway kilometers: 11,289

Bridges: 3,057

Pipe: 511,182

*Hazus-MH. Earthquake Event Report. Print Date: April 12, 2012

Business/Community Continuity

1,425,000 BUILDINGS (Oregon)*

Total Residential: 1,296,750

Total Commercial: 128,250

*Hazus-MH. Earthquake Event Report. Print Date: April 12, 2012

Business/Community Continuity

Total Office SF

Northwest Commercial Building Stock Assessment
Prepared for the Northwest Energy Efficiency Alliance. December 1, 2009

Size (1,000 sf)	Office %	# of Buildings	Percentage
< 5	8.5	7,759	43.4
5 - 19	20.10	7,057	39.5
20 - 49	13	1,695	9.5
50 - 99	12	730	4.1
100 - 499	34.70	528	3.0
>= 500	11.7	107	.6
Total	100	17,876	100

Business/Community Continuity

Essential Facilities*

Hospitals: 1,124 Emergency Operations Centers: 8

Schools: 1,574 Dams: 680

Fire Stations: 334 High hazard dams: 108

Police Stations: 273 Hazardous materials sites: 829

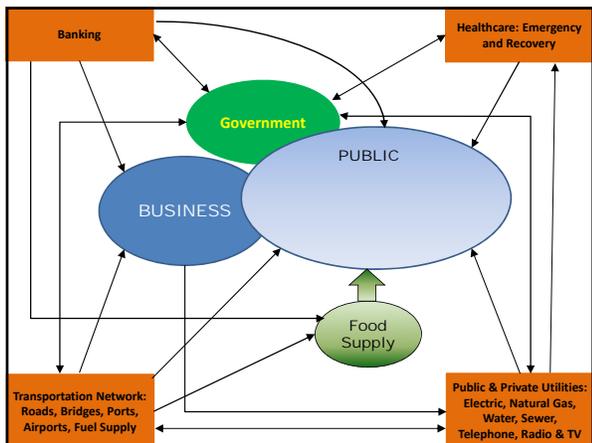
*Hazus-MH. Earthquake Event Report. Print Date: April 12, 2012

Business/Community Continuity

Commercial Building Damage

Earthquake Hazard Report: April 9, 2012

Commercial	None	Slight	Moderate	Extensive	Complete	Total
Metro Region	6,759	10,106	12,270	4,647	461	34,242
Outside Metro	14,333	7,596	11,878	7,904	3,072	44,785
Total	21,092	17,702	24,148	12,551	3,533	79,027



Business/Community Continuity

The State does not have policies that assure a level of resiliency, emergency response and recovery are in place and actively maintained for the state, county, city and businesses.

Recommendations:

- Require all county and city Emergency Operations Centers (EOC) to establish a Business BEOC function, web site and staff position that are coordinated at the State level by the State's BEOC function to provide local support to businesses for resiliency, response and recovery activities.
- Require all state, county, and city departments have annual reviews/exercises of Continuity of Operations Plans (COOP) in place.
- Offer eBRP toolkit at no cost to businesses larger than 10,000 square feet or 25 number of employees. This information must be available to the private sector, upon request at no charge.
- Offer training for all communities, prioritizing communities in a high-risk area (Oregon Coast, etc.).
- Require all business licensed in Oregon to certify during the licensing process that they have emergency response and business continuity plans.
- Establish a state program to provide for ATC 20 Certified inspectors. State assumes cost/risk/liability for state sponsored/trained inspectors. State also provides liability protection for business owners from contractor's erroneous good faith estimates.
- Require business certifications for out of state business coming to provide recovery support.

Business/Community Continuity

The Business /Community Continuity Sub-Committee (BCC) approached the 50 year preparedness goal for businesses and workforce by dividing the effort into three main areas:

- Resiliency – what can be done now to help businesses prepare for, recover from and remain in Oregon at the state, county, city and business levels after an event?
- Emergency Response – what can the state, county, city and the businesses do to respond to an event to minimize the impact to businesses' physical assets, supporting infrastructure and workforce; allowing business to resume activity in the shortest possible time?
- Recovery - what can the state, county, city and the businesses do to facilitate their economic recovery?

Business/Community Continuity

Uncertainty about how businesses will respond during an earthquake.

Recommendations:

- Identify all buildings greater than 10,000 square feet that they expect will survive a major event. State will create and maintain a public database of all critical buildings, locations of emergency shelters, etc. Included in the database will be the status of risk areas including stable electrical power, reliable communications, logistics: rail, airport, roadways, water ways, water & sanitation; and waste disposal.
- Provide resources to help building owners seismically upgrade their asset(s). State to act as a "clearing house" for seismic funding options including: tax reduction incentives; federal and state grants, or low interest loans; state to ensure a timely business recovery loan process. (Consider resources such as the Small Business Administration disaster loans for businesses following an event).
- Work with the Building Codes Division (BCD) to require all buildings greater than 50,000 square feet to have gas piping to be equipped with a gas shutoff valve.

Business/Community Continuity

Sub-Committee Findings

- The State does not have policies that assure a level of resiliency, emergency response and recovery are in place and actively maintained for the state, county, city and businesses
- Uncertainty about how businesses will respond during an earthquake
- The State needs to align its resiliency, emergency response and recovery plans with the Department of Homeland Security's Critical Infrastructure Sectors to assure coordination planning/response for natural disasters and terrorist attacks

Business/Community Continuity

The State needs to align its resiliency, emergency response and recovery plans with the Department of Homeland Security's Critical Infrastructure Sectors to assure coordination planning/response for natural disasters and terrorist attacks.

Recommendations:

- Use the 18 Critical Infrastructure Sectors: Food & Agriculture; Banking & Finance; Chemical, Commercial Facilities; Communications; Critical Manufacturing; Dams; Defense Industrial Base; Emergency Services; Energy; Government Facilities; Healthcare & Public Health; Information Technology; National Monuments & Icons; Nuclear Reactors; Materials & Waste; Postal & Shipping; Transportation Systems, and Water, to list all related companies in Oregon and require them to certify they have emergency response and business continuity plans in place and are exercised or used annually.
- State to use the Business EOC (BEOC) function to coordinate the command, control and communications (C3) of the listed companies for providing evidence of certification, exercising and event response. Require all critical infrastructure companies to register with their local BEOC's and provide business and emergency contact information of their senior operations personnel.
- Legislature to mandate that cities throughout Oregon provide a risk assessment of their major lifelines, develop clear instructions for citizens how to evacuate the city, and develop a plan to transport workers and emergency supplies necessary for recovery.

Oregon Resilience Plan Coastal Resilience Workgroup

Advisory Panel Meeting
October 5, 2012

Jay Wilson
OSSPAC, Vice Chair

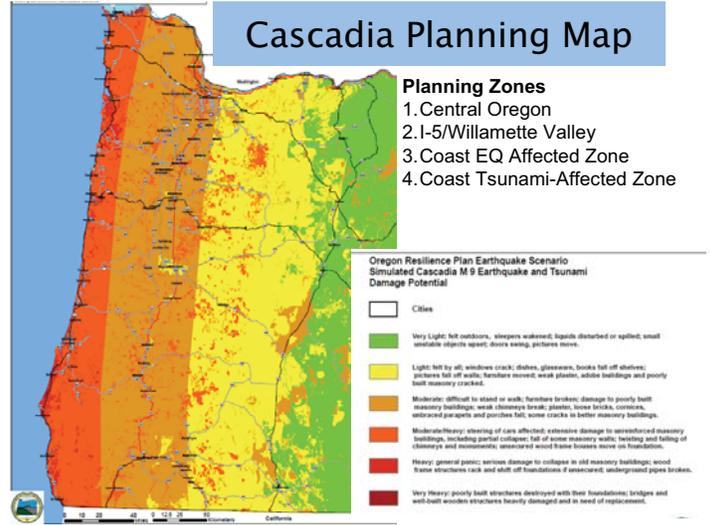


Oregon Seismic Safety Policy Advisory Commission

Cascadia Planning Map

Planning Zones

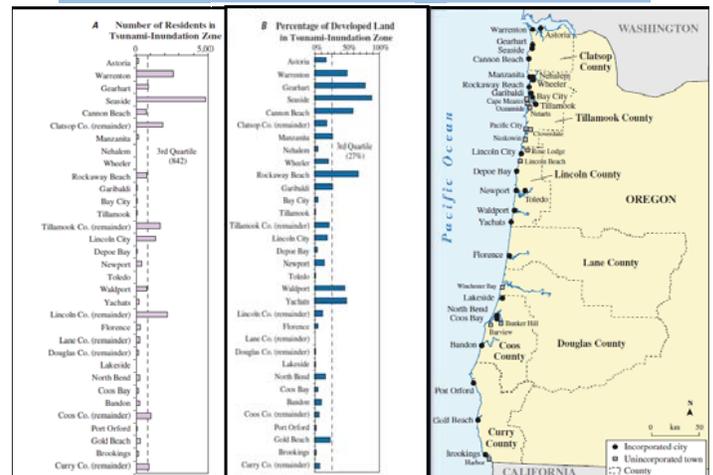
1. Central Oregon
2. I-5/Willamette Valley
3. Coast EQ Affected Zone
4. Coast Tsunami-Affected Zone



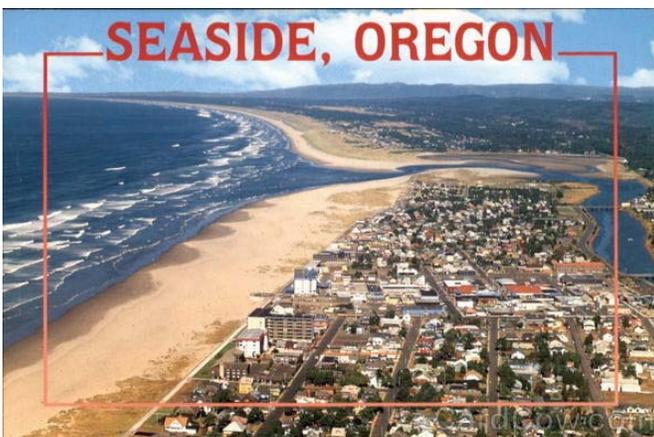
Coast – Most Significant Issues

- **Comprehensive Approach for Life Safety**
 - Evacuation and shelter for people displaced
 - Short-term and long-term housing
- **Target for 90% Restoration of Services in Two Weeks – Reasonable? Possible?**
 - Greatest immediate and long-term needs for assistance in the State (per capita).
 - Interdependency between Tsunami and EQ Zones
 - Weather-dependent capabilities?
- **Mitigation, Recovery and Reconstruction**
 - Land use guidance for community relocations
 - Return of Community Economic Base
- **Debris Management**

Tsunami Life Safety



Tsunami Destination



Tsunami Destination - Depot Bay



Tsunami Destination - Newport



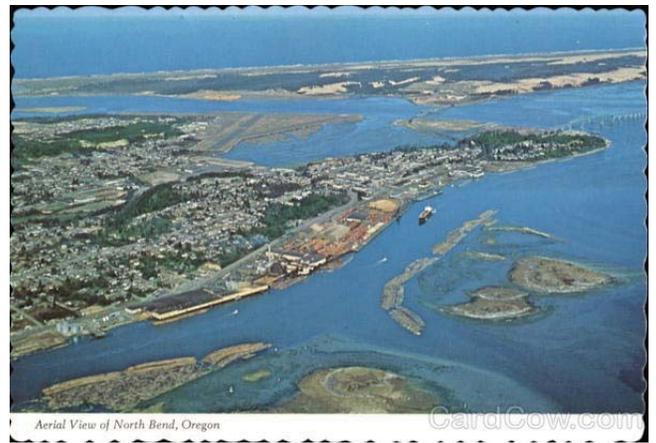
Tsunami Destination - Florence



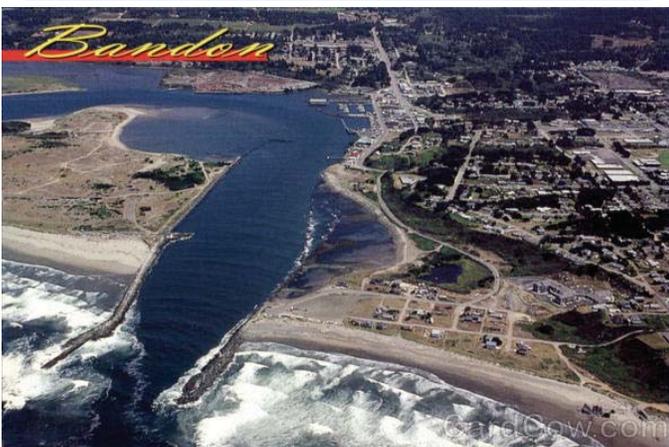
Tsunami Destination - Winchester Bay



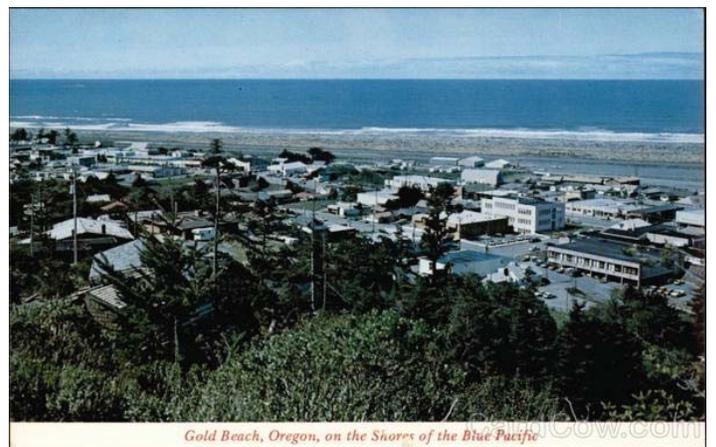
Tsunami Destination - North Bend



Tsunami Destination



Tsunami Destination - Gold Beach



Earthquake vs. Tsunami Zone

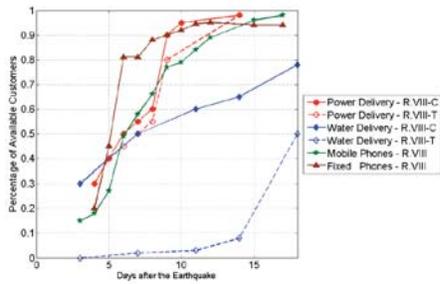


Minamisanriku Tsunami Zone - Zero Capacity

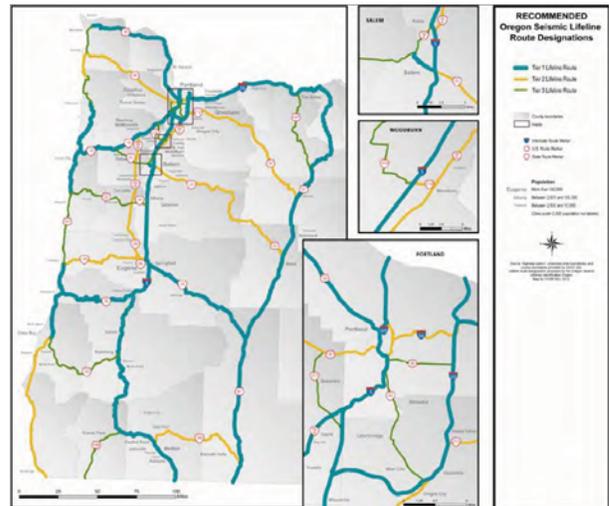


Most Significant Issues

- Expected Recovery Timeline of 90% Services?



Empirical restoration times for power delivery, water distribution, and telecommunications. The letters C and T indicated the cities of Concepción and Talcahuano, respectively. Both cities are in Region VIII, whose capital is Concepción.



Debris Management



Coastal communities will likely have restrictions on readily available land within their jurisdictional boundaries and grapple with environmental concerns about disposing of tens of thousands of tons of debris – with much of it possibly contaminated.

Reconstruction and Recovery

Policy arrangement for realizing reconstruction goal

~ Protecting Lives, Living with the Sea and the Earth, Creating Home Town Iwate, Sanriku ~



Relationship Between Sustainability and Disaster Resilience



Source: Public Entity Research workgroup

OSSPAC

ENERGY TASK GROUP



Major electric supply lines
Major gas pipelines
Major liquid fuel pipelines
Major ports
Major refineries

Electric
Natural Gas
Liquid Fuel







The Risks by Sector

- Liquid Fuels Delivery Systems
 - the liquid fuel transmission pipeline
 - Liquid fuel pipeline was largely constructed in the 1960s when the regional seismic hazards were unknown and state-of-practice construction techniques at that time did not include any reference to seismic standards
 - marine vessels
- Storage – The bulk in tank Farms



Earthquake/Tsunami Scenario

- 4 Distinct Regions
 - Coastal Tsunami
 - Coastal Non-Tsunami
 - Valley
 - Eastern Oregon
- Oregon's critical energy infrastructure (CEI) are not governed by a uniform set of design and construction codes
 - Much of the existing CEI has been constructed with severe seismic design deficiencies
 - New critical infrastructure is often constructed without adequate seismic provisions
 - To minimize extensive direct earthquake damage, substantial improvements to the CEI are necessary

The Risks by Sector

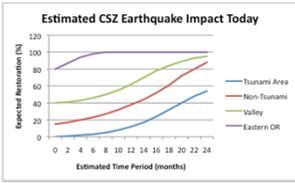



- Shipping channel
 - The navigational channel from the Columbia River mouth to the lower Willamette River is used to transport fuel by marine vessels
 - The Columbia River mouth is expected to have tsunami damage and the channel is expected to experience slope failure, which would close the channel to traffic
 - It is possible that bridges and other river crossings, such as buried gas pipelines and electrical crossings, would be damaged and temporarily block the waterway
 - The regional seismic hazards are now known to be significant and the soils at the river crossings are susceptible to liquefaction and lateral spreading
 - Closure of the shipping channel would prevent marine vessels from delivering liquid fuel as well as emergency response and recovery equipment from being delivered

CSZ Resiliency - Today

The Four Regions

- Tsunami Impacted Coastal areas
- Tsunami Not-Impacted Coastal areas
- Valley
- Eastern Oregon



Recovery Timeframe Graphical Representation

Impact of a CSZ earthquake today for each of the 4 regions, with the exception of Eastern Oregon, would be catastrophic!

The Risks by Sector

- Marine terminals
 - All of the port facilities in the CEI Hub have significant seismic risks due to liquefaction, lateral spreading, and seiches
 - Some older piers were constructed without any seismic protection, have deteriorated, and are likely to fail in even a moderate earthquake
 - If oil products are released and contaminant the navigable waterway, the waterway may be closed to river traffic thus impeding emergency response activities as well as the supply chain
 - The local capacity to fight fires and clean hazardous material spills is limited.




The Risks by Sector



- Fuel supply
 - Only three existing tanks are known to have addressed liquefaction vulnerabilities
 - The fuel terminals in the CEI Hub on average have a three to five day supply in the tank farms for regular unleaded gasoline and diesel fuel
 - Premium gasoline is subject to the daily delivery and heavily dependent on whether the intercompany pipeline on Front Avenue is operational
 - If the supply chain is disrupted by pipe breaks north of the CEI Hub and closure of the shipping channel to the west, fuel would quickly become scarce
 - Options to transport fuel from the east and south and by air are very limited.

The Risks by Sector



- Electricity
 - The bulk of the electrical networks were not built to withstand moderate to significant earthquakes
 - Electrical facilities and systems have significant seismic risk due to ground shaking and ground failure, including liquefaction and lateral spreading
 - Seismically vulnerable facilities include substations, Switch Stations, transmission lines, power plants, and key distribution substations
- CSZ damage to the western electrical grid will likely result in grid blackout
- BPA is the only transmission operator that has taken seismic vulnerability seriously

The Risks by Sector



- Portland International Airport (PDX)
 - PDX airport receives 100 percent of their liquid fuels from a terminal in the CEI Hub
 - PDX has a limited on-site fuel supply
 - If the pipeline between the CEI Hub and PDX fails, then PDX would likely experience a shortfall and operations would be impacted.

Impacts to Oregon

- Based on visual observations, engineering judgment, limited analyses, and limited information from the facility operators, and available literature, significant seismic risk exists in the CEI
- Some critically important structures appear to be susceptible to significant damage in a major earthquake with catastrophic consequences
- Multiple liquid fuel transmission pipe breaks and natural gas transmission pipe breaks are possible
- Damage to liquid fuel, natural gas, and electrical facilities will occur.
- The waterway would likely be closed and require clean up.

The Risks by Sector



- Natural Gas
 - Oregon's largest natural gas service provider receives the majority of their natural gas from pipelines that cross under the Columbia River both near Sauvie Island and also between Washougal, Washington and Troutdale, Oregon
 - One of the natural gas pipelines crosses under the Willamette River at Multnomah Channel near their gate station at the southern end of Sauvie Island
 - The soils at these river crossings are subject to liquefaction and lateral spreading
 - The natural gas company's storage capacity is limited and pipe breaks could lead to a natural gas shortfall in the state as well as explosions or fires.

Impacts to Oregon

- Due to a combination of the existing seismic hazards, vulnerability of the exposed infrastructure and potential consequences, Cascadia earthquakes pose substantial risk to the CEI in Oregon
- Not only are the energy sector facilities dependent on other sectors and systems, including transportation and communication, they are interdependent upon each other
- A major Cascadia earthquake and tsunami would likely produce an unprecedented catastrophe much larger than any disaster the state has faced.
- Western Oregon will likely face an electrical blackout, extended natural gas service outages, liquid fuel shortage, as well as damage and losses in the tens of billions of dollars in a future major Cascadia earthquake
- Preparing for a catastrophic disaster to become more resilient is needed to improve personal safety and security, and safeguard communities and businesses.

Recommendations

- Energy sector companies should conduct **Seismic Vulnerability Assessments** on all of their systems or facilities, and should work with the appropriate local, state, tribal and federal government agencies and stakeholders to achieve timely completion of the assessments to understand existing vulnerabilities.
- Energy sector companies should institutionalize long-term **seismic mitigation programs**; and should work with the appropriate local, state, tribal and federal government agencies and stakeholders to achieve timely and effective mitigation to ensure facility resilience and operational reliability.

CSZ Resiliency in 50 years

The Four Regions

- Tsunami Impacted Coastal areas
- Tsunami Not-Impacted Coastal areas
- Valley
- Eastern Oregon

Recommendations

- The State of Oregon's **Homeland Security Council or OPUC** should be given the authority to review the vulnerability and resilience of the energy sector to earthquakes and other natural disasters within the scope of their mission.
- Energy sector companies and the State of Oregon should **build Oregon's seismic resilience** to a Cascadia earthquake.
 - Adopting pro-active practices and a risk management approach will help achieve seismic resilience. Encouraging a culture of awareness and preparedness concerning the seismic vulnerability of the energy sector including long range energy planning should be conducted.

Policy Recommendations

- Legislature establish a new regulatory authority with oversight authority on seismic resiliency of Critical Energy Infrastructures
 - Oregon Homeland Security Council (Oregon Revised Statute ORS 401.109)
 - Oregon Public Utility Commission
- Mandate all energy service providers complete Seismic Vulnerability Assessments (VA) and long-term Mitigation Plans by February 28, 2015, and report back to the Overseeing Authority.
- Mandate all energy service providers implement the top 10% findings from the VA by February 28, 2025, and provide annual performance reports to Overseeing Authority.
 - The remaining 90% be incorporated in the normal operations & maintenance, and capital projects plan, with the goal of achieving resiliency by February 28, 2065.
- Mandate all energy service providers provide annual performance reports to Overseeing Authority.

Electric Specific Recommendation

- Perform an Oregon regional electrical systems study within 1 year (feb 28, 2014)
 - It can be done independent of IOUs and COUs
 - Independent of infrastructure ownership
 - Provide broad reliability picture of the electrical systems
 - It can be shared in 1 year

(This has been done for the New Madrid earthquake area by US DOE's Argonne National Lab.)

Resilience Triangle (modified from MCEER)

Multidisciplinary Center for Earthquake Engineering Research

RESILIENT OREGON Workshop
October 5, 2012

TRANSPORTATION Assessment

Resilient OREGON Workshop
October 5, 2012

Highway Transportation

- Majority of Highway bridges built well before Seismic Specifications were available
- Landslides and Rockfalls make our highways even more vulnerable
- ODOT has performed a initial assessment of state owned bridges and landslide inventory West of Cascades
- A Draft of Highway Lifelines has been proposed, along with a mitigation plan

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Transportation Workgroup

- Highway Transportation
- Rail Transportation
- Air Transportation
- Water Transportation (River and Ocean Ports)
- Public Transit Services
- Local Agency Representatives
- Consultants
- Academia

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Highway Transportation



- The Highway Lifeline Maps and Seismic Options Report presented to OTC (06/21/2012)
- Highway assessment shows 3+ years needed to restore 90% capacity on Western OR
- 1-3 years restoring 60% capacity of Tier 1 Routes
- Accessing the damaged structures becomes an issue

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Transportation Workgroup

- Monthly meetings (in person, phone, or i-Link)
- Multimode Transportation Workshop (Sep. 17)
- Draft Report sent out on October 1st
 - *Resiliency Target: Minimal, Functional, and Operational
- Appendix "A"
 - * Highways, Rail, Airports, Ports, Public Transit
- Appendix "B"
 - * Local Transportation System

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Mode	Highway	Rail	Air	Port	Public Transit
Highway System - Tier 1 (H1)	Minimal	Minimal	Minimal	Minimal	Minimal
Highway System - Tier 2 (H2)	Minimal	Minimal	Minimal	Minimal	Minimal
Highway System - Other Routes	Minimal	Minimal	Minimal	Minimal	Minimal
Air Transport System	Minimal	Minimal	Minimal	Minimal	Minimal
Port System	Minimal	Minimal	Minimal	Minimal	Minimal
Public Transit System	Minimal	Minimal	Minimal	Minimal	Minimal

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Rail Transportation

- Rail lines are generally privately owned
- Older bridges
- Landslides
- Liquefaction
- Tunnels
- No redundancy (long detours)



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Public Transit

- 5 – public transit regions in Oregon
- Public transit buses & school district buses can assist on emergency evacuation
- Coastal Transit facilities may have their own problems
- Factors controlling the resiliency
 - * Road Conditions
 - * The ability of drivers to respond
 - * Availability of fuel supplies

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Air Transportation

- 97 public-use airports in Oregon
- Redmond – **FEMA Primary**
- 57 – partially supported by FAA
- 28 – state owned (ODA)
- 16 – other municipalities
- >400 – private owned
- Runways – an issue



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Local Roads and Streets

- On the same condition as State Highways
- Cities & Counties identified alternative Routes
 - * Can be retrofitted for less \$\$
 - * Can be restored much quicker for Emergency Resp.
- A few cities (Portland, Albany) have identified local lifelines connecting to hospitals and emergency centers

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Water Transportation

- **River Ports**
- Docks – at risk
- Liquefaction
- Navigation Channel
- Major river crossings
- Dams & Locks



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Interdependency Assessment

- Supplement a highway “backbone” system with other modes to provide a statewide connectivity at the perceived lowest retrofit cost
- The highway backbone system:
 - * I-5, from I-84 (Portland) to OR58
 - * I-84, from I-5 (Portland) to US97
 - * US97, from I-84 to the CA Border, and
 - * OR58, from I-5 to US97

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Interdependency Assessment

- High priority Airports:
 - * Redmond – FEMA
 - * Portland International
 - * Salem
 - * Eugene
 - * Roseburg
 - * Medford
 - * Klamath Falls

These airports should be made resilient within 10 years

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Interdependency Assessment

- Ports considered part of Multimode Transportation System:
 - * Port of Portland
 - * The Dalles
 - * Hood River
 - * Cascade Locks
 - * Boardman

The overall plan needs to include a resiliency evaluation of the Columbia River channel

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Recommendations

- Perform selective vulnerability assessments in priority order for each transportation mode
- Identify local lifeline routes and detour routes for higher redundancy
- Develop mitigation strategies for other transportation modes, similar to highway's
- Further refine the Interdependency Strategy to ensure a statewide connectivity

**OREGON RESILIENCY
PLANNING**

Critical/Essential Buildings

Ed Quesenberry (Co-chair) Trent Nagele (Co-chair) Amit Kumar Andre Barbosa Anne Monnier David Bugni Dominic Matteri	Ed Dennis Edward Wolf Jason Thompson Jennifer Eggers Jim Weston Joe Gehlen Josh Richards Kevin Kaplan Kimberly Dills Mark Tobin	Michael Wieber Richard Rogers Robert Johnson Shane Downing Shelly Duquette Terry Shugrue Tim Rippey Tonya Halog Willy Paul
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TABLE 1
ASSESSMENT APPROACH

2007 SSNA Data Set

- **Engineering Review, and conversion to Recovery Score**
 - Emergency Operations
 - Police and Fire Stations
 - Healthcare Facilities
 - K-12 Schools
 - Emergency Sheltering*

**CRITICAL/ESSENTIAL
BUILDINGS**

- Hospitals (60 facilities)
- Police/Fire Stations (109 police, 595 fire)
- Emergency Operations Centers (82)
- K-12 Schools (2,377 facilities)
- Emergency Sheltering Facilities
- Community Retail Centers and Banks
- Single Family Residential (960,000 est.)
- URM and Non Ductile Conc. Bldgs (40,000+ est.)
- Critical Government Facilities

TABLE 2
ASSESSMENT APPROACH

FEMA HAZUS Model

- **Statistical analysis based on census data**
- **Estimates quantity, size, type and age of structures**
- **Statistically determines expected damage for estimated building set**

TABLE 1
ASSESSMENT APPROACH

2007 DOGAMI Statewide Structural Needs Assessment (SSNA)

- Rapid Visual Screening (FEMA 154)
- Each building evaluated individually
- Screening factors include type of structure, age, occupancy, soil type, vertical irregularity, plan irregularity

TABLE 2
ASSESSMENT APPROACH

FEMA HAZUS Model

- **Converted damage estimates to Recovery Score**
 - Residential Housing
 - Community Retail Centers and Banks
 - Vulnerable Buildings*
 - Critical Government Facilities

FINDINGS

Table 1 – 2007 SSNA

EOC, Police & Fire Stations

Table 1. Target States of Recovery For Oregon's Buildings Based on DOGAMI Assessments and Engineering Review									
Infrastructure Cluster Facilities	Event Occurs	Phase 1 (hours)			Phase 2 (Days)		Phase 3 (Months)		
		4	24	72	30	60	4	18	36+
Emergency Operations Centers (Coastal)								X	
Emergency Operations Centers (Valley)							X		
Emergency Operations Centers (Eastern)					X				
Police Stations (Coastal)									X
Police Stations (Valley)							X		
Police Stations (Eastern)					X				
Fire Stations (Coastal)									X
Fire Stations (Valley)						X			
Fire Stations (Eastern)			X						

Target State
 X Current State (approx.)

FINDINGS

Table 2 – FEMA Hazus

Retail Centers, Banking Institutions

Table 2. Target States of Recovery For Oregon's Buildings Based on FEMA HAZUS Loss Estimations									
Infrastructure Cluster Facilities	Event Occurs	Phase 1 (hours)			Phase 2 (Days)		Phase 3 (Months)		
		4	24	72	30	60	4	18	36+
Community Retail Centers (Coastal)									
Community Retail Centers (Valley)						X			
Community Retail Centers (Eastern)	X								
Financial/Banking (Coastal)							X		
Financial/Banking (Valley)						X			
Financial/Banking (Eastern)	X								

Target State
 X Current State (approx.)

FINDINGS

Table 1 – 2007 SSNA

Healthcare Facilities

Table 1. Target States of Recovery For Oregon's Buildings Based on DOGAMI Assessments and Engineering Review									
Infrastructure Cluster Facilities	Event Occurs	Phase 1 (hours)			Phase 2 (Days)		Phase 3 (Months)		
		4	24	72	30	60	4	18	36+
Healthcare Facilities (Statewide)								X	
Healthcare Facilities (Coastal)								X	
Healthcare Facilities (Valley)								X	
Healthcare Facilities (Eastern)					X				
Healthcare Facilities* (Statewide)									X
Healthcare Facilities* (Coastal)									X
Healthcare Facilities* (Valley)									X
Healthcare Facilities* (Eastern)					X				

Target State
 X Current State (approx.)

* Includes consideration of non-structural components

FINDINGS

Table 2 – FEMA Hazus

Residential Housing and Vulnerable Bldgs

Table 2. Target States of Recovery For Oregon's Buildings Based on FEMA HAZUS Loss Estimations									
Infrastructure Cluster Facilities	Event Occurs	Phase 1 (hours)			Phase 2 (Days)		Phase 3 (Months)		
		4	24	72	30	60	4	18	36+
Residential Housing (Coastal)						X			
Residential Housing (Valley)		X							
Residential Housing (Eastern)	X								
Vulnerable Buildings									X
Vulnerable Buildings						X			
Vulnerable Buildings								X	

Target State
 X Current State (approx.)

FINDINGS

Table 1 – 2007 SSNA

Schools and Emergency Sheltering

Table 1. Target States of Recovery For Oregon's Buildings Based on DOGAMI Assessments and Engineering Review									
Infrastructure Cluster Facilities	Event Occurs	Phase 1 (hours)			Phase 2 (Days)		Phase 3 (Months)		
		4	24	72	30	60	4	18	36+
Primary/ K-8 (Coastal)								X	
Primary/ K-8 Centers (Valley)								X	
Primary/ K-8 (Eastern)					X				
Secondary/High School (Coastal)								X	
Secondary/High School (Valley)								X	
Secondary/High School (Eastern)					X				
Emergency Sheltering (Coastal)								X	
Emergency Sheltering (Valley)								X	
Emergency Sheltering (Eastern)					X				

Target State
 X Current State (approx.)

FINDINGS

Table 2 – FEMA Hazus

Critical Government Facilities

Table 2. Target States of Recovery For Oregon's Buildings Based on FEMA HAZUS Loss Estimations									
Infrastructure Cluster Facilities	Event Occurs	Phase 1 (hours)			Phase 2 (Days)		Phase 3 (Months)		
		4	24	72	30	60	4	18	36+
Critical Government Facilities (Coastal)						X			
Critical Government Facilities (Valley)							X		
Critical Government Facilities (Eastern)	X					X			

Target State
 X Current State (approx.)

RECOMMENDATIONS

4.4.1 Existing Buildings

- **Exempt Buildings (4.4.1.1)**
 - One and two-family dwellings
 - Buildings in low seismic hazard area
 - Exempt buildings
- **Building Inventory (4.4.1.2)**

RECOMMENDATIONS

4.4.1 Existing Buildings

- **Upgrade Nonstructural Elements of Essential and Hazardous Facilities (4.4.1.5)**
- **Passive Trigger Seismic Strengthening Program (4.4.1.6)**
- **Require Disclosure of URM and Non-ductile Concrete Building's Seismic Resistance (4.4.1.8)**
- **Limitation of Liability (4.4.1.9)**

RECOMMENDATIONS

4.4.1 Existing Buildings

- **Mandatory Seismic Strengthening (4.4.1.3)**
 - URM and Non-ductile Concrete Buildings
 - Essential Facilities within 20 years
 - All others within 30 years
 - Hospitals within 15 years
 - EOC, Police, Fire within 30 years (non URM)
 - Buildings damaged by Earthquakes

RECOMMENDATIONS

4.4.2 New Buildings

- **Siting (4.4.2.1)**
- **Incentives for Performance Based Design (4.4.2.2)**
- **Permit Review of Significant Structures by Licensed Structural Engineers (4.4.2.3)**
- **Expand certain Special Inspections and Structural Observations (4.4.2.4)**

RECOMMENDATIONS

4.4.1 Existing Buildings

- **K-12 Schools (4.4.1.4)**
 - Expand seismic rehab grant program
 - Prioritize replacement of URM's
 - Require ASCE-31 seismic assessments
 - Database of school seismic assessments
 - Statewide plan to resume education

RECOMMENDATIONS

4.4.3 State Office of the Structural Engineer

- **Establish a lead agency for implementing and coordinating statewide seismic/structural resilience policy.**
- **Advocacy and education**
- **Assist other state agencies**
- **Research**
- **Develop administrative rules and standards**

RECOMMENDATIONS

- **4.4.3 Earthquake Performance Rating System**
 - Voluntary
 - Applicable to all building types, new and old
- **4.4.5 Education**
 - Public awareness
 - Education in schools
 - Contractor education

RECOMMENDATIONS

- **4.4.6 Timeline**
 - Now is the time to get started!
- **4.4.7 Emergency Response**
 - Database of post-earthquake inspectors
 - Establish protocols for volunteers
 - Strengthen Good Samaritan laws

THANK YOU!

CRITICAL BUILDINGS TASK GROUP

Ed Quesenberry (Co-chair)	Ed Dennis	Michael Wieber
Trent Nagele (Co-chair)	Edward Wolf	Richard Rogers
Amit Kumar	Jason Thompson	Robert Johnson
Andre Barbosa	Jennifer Eggers	Shane Downing
Anne Monnier	Jim Weston	Shelly Duquette
David Bugni	Joe Gehlen	Terry Shugrue
Dominic Matteri	Josh Richards	Tim Rippey
	Kevin Kaplan	Tonya Halog
	Kimberly Dills	Willy Paul
	Mark Tobin	

INFORMATION AND COMMUNICATIONS TECHNOLOGY

Oregon Resilience Plan Workshop
October 5, 2012

- ## Information and Communications Technology
- In the early phases of recovery achieving these capabilities may require the use of temporary/interim contingencies (i.e., mobile cellular towers) while more permanent repairs and installations are being done.
 - Establishing target timeframes for the tsunami inundation zone, beyond a minimal level of capability to support response, is not practical. A large amount of planning and prioritizing will need to be undertaken to identify which areas will be rebuilt first. These will then be the areas in which the information and communications systems will be re-established first.

Information and Communications Technology

KEY TO THE TABLE

Target Timeframe for recovery:

- Operational:** Restoration is up to 90% of capacity. A full level of service has been restored and is sufficient to allow people to use for non-essential needs like entertainment. 80%-90%
- Functional:** Although service is not yet restored to full pre-event capacity, it is sufficient to get the economy moving again (e.g. business uses for credit cards and banking). Limits may be placed on uses that take up a lot of capacity like streaming video. 50% - 60%
- Minimal:** A minimum level of service is restored, primarily for the use of emergency responders, repair crews, and in support of critical health and human services (mass care) 20% - 30%

Estimated time, under current conditions, for system wide recovery to be at or 90% of pre-event capacity

G
Y
R
X

Information and Communications Technology

TARGET STATES OF RECOVERY: INFORMATION AND COMMUNICATIONS TECHNOLOGY SECTOR

	Event occurs	0-24 hours	1-3 days	3-7 days	1 week-2 weeks	1 month-3 month	3 month-6 month	6 month-1 year	1 year-3 years	3+ years
ZONE 1 - COAST/Tsunami ZONE				R						
Buildings (includes Central Offices, Internet Exchange Points, and Cable Landings)									X	
Equipment in Buildings and on towers									X	
Towers									X	
Underground Lines									X	
Overhead Lines									X	

- ## Information and Communications Technology
- Planning Notes:
- Performance Capability for the purpose of recovery is viewed across all information and telecommunications systems supporting voice and data communications.
 - The restoration objectives are based on an assumption that all other lifelines, such as roads and electricity, are functioning at a level that will support restoration of the information and communications infrastructure.
 - In areas where the "customer" is not ready to accept service, then the service provider is not expected to meet established restoration timeframes.

Information and Communications Technology

TARGET STATES OF RECOVERY: INFORMATION AND COMMUNICATIONS TECHNOLOGY SECTOR

	Event occurs	0-24 hours	1-3 days	3-7 days	1 week-2 weeks	1 month-3 month	3 month-6 month	6 month-1 year	1 year-3 years	3+ years
ZONE 2 - COAST/ NON-Tsunami ZONE			R	Y	G					
Buildings									X	
Equipment in Buildings									X	
Towers									X	
Underground Lines								X		
Overhead Lines								X		

Information and Communications Technology

TARGET STATES OF RECOVERY: INFORMATION AND COMMUNICATIONS TECHNOLOGY SECTOR										
	Event occurs	0-24 hours	1-3 days	3-7 days	1 week-2 weeks	1 month-3 month	3 month-6 month	6 month-1 year	1 year-3 years	3+ years
ZONE 3 - VALLEY		R	Y	G						
Buildings						X				
Equipment in Buildings						X				
Towers						X				
Underground Lines						X				
Overhead Lines					X					

- ### Recommendations
- Include in site development and zoning codes the requirement for Information and Communications technology structures to be built to withstand the potential impacts of a scenario earthquake and tsunami.
 - This should include limitations on building in tsunami inundation areas, construction of antenna towers on buildings that do not meet the critical facility standard and accounting for potential of liquefaction and slope instability when construction towers, buildings, underground utilities and overhead lines.

Information and Communications Technology

TARGET STATES OF RECOVERY: INFORMATION AND COMMUNICATIONS TECHNOLOGY SECTOR										
	Event occurs	0-24 hours	1-3 days	3-7 days	1 week-2 weeks	1 month-3 month	3 month-6 month	6 month-1 year	1 year-3 years	3+ years
ZONE 4 - EASTERN OREGON		R	Y	G						
Buildings						X				
Equipment in Buildings						X				
Towers				X						
Underground Lines				X						
Overhead Lines				X						

- ### Recommendations
- Adopt clear statewide uniform standards, like the NEBS (Network Equipment-Building System), for the adequate performance and bracing of information and telecommunications equipment need to withstand the scenario event and establish a mechanism for reliable enforcement.
 - In conjunction with the ODOT's hardening of primary transportation routes, establish a hardened backbone for information and telecommunications systems

- ### Recommendations
- Recommended changes in practice that would make the sector compliant in 50 years.
- Establish oversight authority to a State entity that would be responsible for overseeing the resilience of the information and telecommunications industry operating and/or providing services in Oregon.
 - Require Central Offices, Internet Exchanges, remote terminals and submarine cable landings to be built to or retrofitted to the "critical facility" standard.

- ### Suggested Policy Changes
- Three Four suggested policy changes to enable those changes in practice?
1. Legislature establish a new regulatory authority to the Oregon Homeland Security Council (Oregon Revised Statute ORS 401.109) on seismic information and communication resiliency and security issues in cooperation with other relevant authorities.

Suggested Policy Changes

2. Mandate that information and communication service providers complete Seismic Vulnerability Assessments and long-term Mitigation Plans by February 28, 2014, and report to Oregon Homeland Security Council (Oregon Revised Statute ORS 401.109) and other relevant authorities.

Suggested Policy Changes

3. Mandate the information and communication service providers harden all Priority Paths (to achieve a resilient backbone) by February 28, 2018, and provide annual performance reports to Oregon Homeland Security Council (ORS 401.109) and other relevant authorities.
4. Mandate the information and communication service providers harden systems to the performance target restoration objectives by February 28, 2023, and provide annual performance reports to Oregon Homeland Security Council (ORS 401.109) and other relevant authorities.

QUESTIONS



Water/ Wastewater Committee

Resilience Workshop

5 October, 2012

Water & Wastewater Sector Table – Valley Zone

KEY TO THE TABLE
TARGET TIMEFRAME FOR RECOVERY:
 Desired time to restore component to 80-90% operational G
 Desired time to restore component to 50-60% operational Y
 Desired time to restore component to 20-30% operational R

TARGET STATES OF RECOVERY: WATER & WASTE WATER SECTOR

	0-24 hours	1-3 days	3-7 days	1 week - 2 weeks	2 weeks - 1 month	1 month - 3 months	3 months - 6 months	6 months - 1 year	1 year - 3 years	3+ years
Domestic water supply										
Possible water available at supply source (WTP, wells, impoundment)	R	Y		G				X		
Main transmission facilities, pipes, pump stations, and reservoirs ("backbone") operational	G					X				
Water supply to critical facilities available	Y	G				X				
Water for fire suppression - at key supply points	G		R	Y	G				X	
Water for fire suppression - at fire hydrants			Y	G	X					
Water available at community distribution center/points			R	Y	G				X	
Distribution system operational										X
Wastewater systems										
Threats to public health & safety controlled			R	Y	G				X	
Raw sewage contained & routed	R	Y			G			X		

Water and Wastewater Systems Participating in the W&WW Work Group

System / Community	Sector
City of Portland	Water & Wastewater
Tualatin Valley Water District	Water
City of Bend	Water
City of Gresham	Water
City of Pendleton	Water
City of Salem	Water & Wastewater
Clean Water Services	Wastewater
Coos Bay – North Bend Water Board	Water

Water & Wastewater Sector Table – Central / Eastern Zone

KEY TO THE TABLE
TARGET TIMEFRAME FOR RECOVERY:
 Desired time to restore component to 80-90% operational G
 Desired time to restore component to 50-60% operational Y
 Desired time to restore component to 20-30% operational R

TARGET STATES OF RECOVERY: WATER & WASTE WATER SECTOR

	0-24 hours	1-3 days	3-7 days	1 week - 2 weeks	2 weeks - 1 month	1 month - 3 months	3 months - 6 months	6 months - 1 year	1 year - 3 years	3+ years
Domestic water supply										
Possible water available at supply source (WTP, wells, impoundment)		X								
Main transmission facilities, pipes, pump stations, and reservoirs ("backbone") operational		X								
Water supply to critical facilities available		X								
Water for fire suppression - at key supply points		X								
Water for fire suppression - at fire hydrants		X								
Water available at community distribution center/points		X								
Distribution system operational		X								
Wastewater systems										
Threats to public health & safety controlled		X								
Raw sewage contained & routed		X								

Water & Wastewater Sector Table – Coast (Non Tsunami) Zone

KEY TO THE TABLE
TARGET TIMEFRAME FOR RECOVERY:
 Desired time to restore component to 80-90% operational G
 Desired time to restore component to 50-60% operational Y
 Desired time to restore component to 20-30% operational R

TARGET STATES OF RECOVERY: WATER & WASTE WATER SECTOR

	0-24 hours	1-3 days	3-7 days	1 week - 2 weeks	2 weeks - 1 month	1 month - 3 months	3 months - 6 months	6 months - 1 year	1 year - 3 years	3+ years
Domestic water supply										
Possible water available at supply source (WTP, wells, impoundment)	R	Y		G				X		
Main transmission facilities, pipes, pump stations, and reservoirs ("backbone") operational	G					X				
Water supply to critical facilities available	Y	G				X				
Water for fire suppression - at key supply points	G		R	Y	G				X	
Water for fire suppression - at fire hydrants			Y	G	X					
Water available at community distribution center/points			R	Y	G				X	
Distribution system operational										X
Wastewater systems										
Threats to public health & safety controlled			R	Y	G				X	
Raw sewage contained & routed			R	Y	G				X	
Treatment plant operational to meet regulatory requirements						R	Y	G	X	
Major pump lines and pump stations operational						R	Y	G	X	
Distribution system operational										X

Estimate of Water Pipeline Breaks & Leaks for Participating Utilities

Characteristic	Estimate
Total Length of Pipe (miles)	4,592
Total Number of Breaks (number)	2,656
Total Number of Leaks (number)	941
Total Number of Services (number)	385,600
Service Line Breaks – Utility Side (2%)	7,712
Service Line Breaks – Customer Side (5%)	19,280

Why so vulnerable?

- Large, complex systems, above and below ground
- Highly dependent on other, vulnerable resources
 - Energy, transportation, chemicals
- Essential facilities in low lying areas along lakes, rivers, coastlines
 - Vulnerable to liquefaction
- Old facilities designed before reasonable seismic criteria in place
- Use of non-ductile materials vulnerable to ground motion
- Collection/distribution systems connections to above ground facilities

Major Recommendations

- General Recommendations
 - Public information campaign to “reset” expectations.
 - ORWARN is a vital resource. W/WW utilities should belong
 - Seismic response plans
 - Employee preparedness plans
 - Seismic design standards for pipelines
 - Business continuity plans
 - Seismic vulnerability criteria should be incorporated in all capital improvement planning

Closing the Gap – Water Systems

- Harden transmission facilities (bridges, river crossings, landslide areas)
- Install additional isolation valves
- Replace vulnerable pump stations built before 1970. Harden those built after
- Rebuild/redesign transitions between in-ground piping and above ground structures
- Replace 20-30% of transmission system piping (Coastal)
 - 80-90% (Valley)
- Replace 20-30% of distribution system piping (Coastal)(Valley)
- Replace tankage built before 1960.
- Harden tankage built after 1960.
- Incorporate seismic resiliency objectives in all future capital projects

Major Recommendations

- Water Specific
 - OHA to require seismic risk assessment as part of master plans
 - Encourage firefighters and water utilities to develop joint earthquake response plans
 - Identify and coordinate key water supply points
 - OHA to require seismic design considerations as part of routine design review
 - DEQ and OHA to establish goals and expectation for compliance following an event

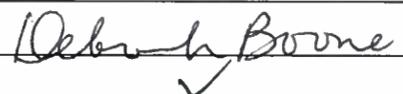
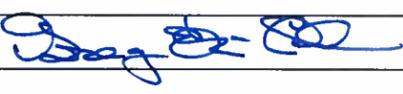
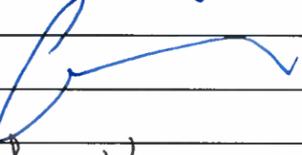
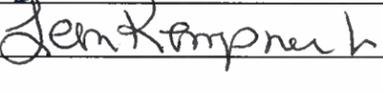
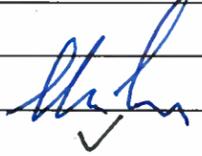
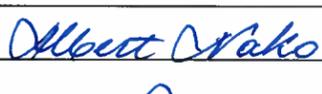
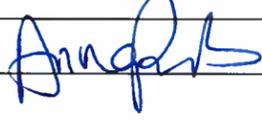
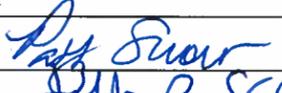
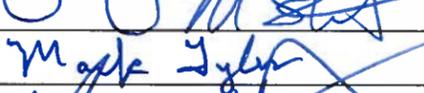
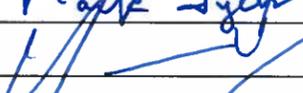
Closing the Gap – Wastewater Systems

- Liquefiable soils, replace 50-60% of collection systems (Coastal and Valley)
 - 50-60% for trunk lines (Coastal)
 - 80-90% for trunk lines (Valley)
- Relocate or seismically upgrade treatment plants built before 2000
 - And all plants in liquefaction zones
- Rebuild or seismically harden pump stations built before 2000
- Provide for emergency power and chem supply
- Incorporate seismic resiliency into future capital improvement projects

Major Recommendations

- Wastewater Specific
 - DEQ to require a seismic risk assessment as part of periodic update of facility plans
 - Wastewater agencies encourage to conduct more complete characterization of the impacts of estimated recovery times for seismic events
 - DEQ to coordinate with wastewater agencies on expectations for levels of service, compliance and standards following a major seismic event
 - Establish agreements for temporary sanitary services after an event
 - Encourage all agencies to plan for significant water quality impacts to Willamette and Columbia Rivers

October 5, 2012 Resilient Oregon Workshop
Sign-in Sheet

Scott Ashford	
Lee Beyer	
Deborah Boone	
Rick Carter	
Peter Courtney	
Ed Dennis	
Greg Ek-Collins	
Carl Farrington	
Fred Girod	
Chris Goldfinger	
JR Gonzalez	
David Harlan	
Onno Husing	
Francisco Ianni	
Bruce Johnson	
Leon Kempner	
Mark Knudson	
Andre LeDuc	
Stephen Lucker	
Ian Madin	
Robin Maxey	
Vicki McConnell	
Michael Mumaw	
Trent Nagele	
Albert Nako	
Jean O'Connor	
Anna Plumb	
Ed Quesenberry	
Jay Raskin	
Althea Rizzo	
Richard Rogers	
Cameron Smith	
Patty Snow	
Jeff Soulages	
Susan Steward	
Michael Stuhr	
Mark Tyler	
Yumei Wang	
Bryce Ward	
Stan Watters	
Gerry Williams	
Jay Wilson	
Ted Wolf	
Nate Wood	
Kent Yu	

Appendix IV List of Oregon Resilience Plan Contributors

Advisory Panel

Name

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Lee Beyer
JR Gonzalez
Bruce Johnson
Ed Dennis
Yumei Wang
Onno Husing
Nate Wood
Scott Ashford
Chris Goldfinger
Andre LeDuc
Jeff Soulages
Edward Wolf
Leon Kempner
Vicki McConnell
Jean O'Connor
Dave Harlan

Affiliation

Governor's Office
State Legislature
State Legislature
Formerly Oregon Public Utility Commission
Oregon Department of Transportation
Formerly Oregon Dept. of Education
DOGAMI/NEHRP
Formerly Oregon Coastal Zone Mgmt Association
U.S. Geological Survey
Oregon State University
Oregon State University
University of Oregon
Intel
Oregon Citizen
Bonneville Power Administration
DOGAMI/WSSPC
Oregon Health Authority
Ports Manager

OSSPAC Steering Committee

Kent Yu (Chair, Public member/Structural)
Jay Wilson (Vice Chair, Public member/local government)
Althea Rizzo (OEM, State Earthquake/Tsunami Manager)
Ian Madin (DOGAMI)
Stan Watters (Public member/Utilities)

Earthquake and Tsunami Scenario Task Group

Name	Role	Affiliation	Category
Ian Madin	Chair	DOGAMI/OSSPAC	State Agency
Bill Burns		DOGAMI	State Agency
Art Frankel		US Geological Survey	Federal
Chris Goldfinger		Oregon State University	University
Matthew Mabey		Oregon Dept. of Transportation	State Agency
George Priest		DOGAMI	State Agency
Yumei Wang		DOGAMI	State Agency
Ivan Wong		URS/EERI	Engineer

Business & Work force Continuity Task Group

Name	Role	Affiliation	Category
Susan Steward	Co-Chair	BOMA/OSSPAC	Assoc. for Building Owners
Gerry Williams	Co-Chair	Construction Research/OSSPAC	Private consulting
Lori Chamberlain		Oregon Business Association	Business Association
Patrick Estenes		The Standard	Insurance
Kelley Okolita		Regence	Healthcare
Patrick Slabe		New Seasons Market	Food Retail
Bert Sorio		Regence	Healthcare
Jeffrey Soulages		Intel	High tech
Rick Van Dyke		Cambia	Healthcare
Bryce Ward		EcoNorthwest/OSSPAC	Economist

Coastal Communities Task Group

Name	Role	Affiliation	Category
Jay Wilson	Co-Chair	Clackmas County/OSSPAC	Local Government
Jay Raskin	Co-Chair	Ecola Creek/OSSPAC	Tsunami Advocate
Jacque Betz		Florence City Manager - Central Coast	Local Government
D-Rep Deborah Boone		Legislature - North Coast	State Legislature
Josh Bruce		Oregon Partnership for Disaster Resilience - State Level	University
Charlie Davis		Bandon City Planner and Emergency Manager - South Coast	Local Government
Sue Graves		Lincoln County School District - Central Coast	Local School District
Dave Harlan		Ports Manager State of Oregon	State Agency
Jeffrey Hepler		US Army Corps - Debris Management Program Manager	Federal
Maggie Kirby		Craft3 Development Manager	Non-profit Financial
R-Sen Jeff Kruse		Legislature - South Coast	State Legislature
Margo Lalich		Clatsop County Public Health Director	Local Government
Jack Lenox		Coquille Tribe Community Planner/Em Mgr - South Coast	Tribal Government
Gary Milliman		Brookings City Manager - South Coast	Local Government
Sam Steidel		City Councilor, Cannon Beach	Local Government
Wayne Stinson		Douglas County Emergency Manager - Central Coast	Local Government
Laren Woolley		Oregon Department of Land Conservation and Development	State Agency

Critical Buildings Task Group

Name	Role	Affiliation	Category
Ed Quesenberry	Co-Chair	Equilibrium Engineers LLC	Engineer
Trent Nagele	Co-Chair	VLMK	Engineer
Andre Barbosa	Resource Manager	Oregon State University	University
David Bugni	Secretary	David Bugni & Associates	Engineer
Ed Dennis		Dept. of Education	State Agency
Kimberly Dills		OHA/Center for Disease Control and Prevention	State Agency
Shane Downing		ORARNG	State Agency
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Joe Gehlen	Resource Manager	Kramer Gehlen	Engineer
Tonya Halog		J.G. Pierson	Engineer

Name	Role	Affiliation	Category
Robert Johnson		Johnson & Broderick Engineering	Engineer
Kevin Kaplan		VLMK	Engineer
Amit Kumar	Treasurer	City of Portland BDS	Local Government
Dominic Matteri		Kramer Gehlen	Engineer
Anne Monnier	Data Manager	KPFF	Engineer
Willy Paul		Kaiser Permanente	Healthcare Provider
Josh Richards	Resource Manager	KPFF	Engineer
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Jason Thompson		KPFF	Engineer
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Michael Wieber		NW Seismic Retrofit	Contractor
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Transportation Task Group

Name	Role	Affiliation	Category
Bruce Johnson	Chair	ODOT Bridges	State Agency
Martin Callery		Port of Coos Bay	Port
Lieutenant Meredith Condon		USCG	Federal Agency
Chris Corich		Oregon State Aviation Board	State Agency
Peter Duskica		Portland State University	University
Greg Ek-Collins		ODOT Maintenance HQs	State Agency
Herb Florer		Port of Astoria	Port
Doug Grafe		Oregon Department of Forestry	State Agency
Elsie Hamner		Port of Coos Bay	Port
Chuck Hutto		ODOT Motor Carrier	State Agency
Doug Kirkpatrick		Consultant, HDR	Engineer
Jeff Langstrom		LOC, City of Eugene	Local Government
Lee Lazaro		ODOT Public Transit Division	State Agency
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Name	Role	Affiliation	Category
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Curran Mohny		ODOT Geology	State Agency
Lucy Moore		ODOT Maintenance HQs	State Agency
Nancy Murphy		ODOT Planning and Lifeline Contract Administrator	State Agency
Albert Nako		ODOT Bridge	State Agency
David Neys		ODOT Maintenance District Rep.	State Agency
David Olongiagh		City of Portland	Local Government
Jeff Olson		Consultant, Quincy	Engineer
Jon Oshel		Assoc. of Counties	Local Government Association
Tom Peterson		Port of Portland	Port
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Craig Totten		Consultant, KPFF	Engineer
Tom Wharton		Port of Portland	Port
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Energy Task Group

Name	Role	Affiliation	Category
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JR Gonzalez	Co-Chair	JRG Engineering	Engineer
Heide Caswell		PacifiCorp	Power Supplier
Rick Carter		Public Utilities Commission	State Agency
Brian Doherty		Miller Nash, llp	Lawyer
Michael Dougherty		Public Utilities Commission	State Agency
Del Draper		Williams	Pipeline
Dave Ford		PGE	Power Supplier
Debbie Guerra		PacifiCorp	Power Supplier
Teresa Hagins		Williams	Pipeline
Marion Haynes		Portland General Electric	Power Supplier
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Name	Role	Affiliation	Category
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Robbie Roberts		NW Natural	Natural Gas Supplier
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Jack Vranish		PacifiCorp	Power Supplier
Yumei Wang		DOGAMI	State Agency
Tashiana Wanger		PacifiCorp	Power Supplier
Grant M. Yoshihara		NW Natural	Natural Gas Supplier

Information and Communications Task Group

Name	Role	Affiliation	Category
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Rick Carter		Public Utilities Commission	State Agency
Michael Dougherty		Public Utilities Commission	State Agency
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JR Gonzalez		JRG Engineering	Engineer
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Devon Lombard		Degenkolb	Engineer
Kelley Stember		Sprint	Communication Provider
Alex Tang		ASCE TCLEE	Subject Expert
Yumei Wang		DOGAMI	State Agency
Stan Watters		Port of Portland	Port
Geoffrey Williams		Integra Telecom	Communication Provider

Water & Waste Water Task Group

Name	Role	Affiliation	Category
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Mark Knudson	Co-Chair	Tualatin Valley Water District	Water Provider
Don Ballantyne		Degenkolb Engineers	Engineer
Steve Behrandt		Portland BES	Water Provider
James Bela		Oregon Earthquake Awareness	Earthquake nonprofit
Andy Braun		Clean Water Services	Waste water
Scott Burns		Portland State University	University
Mel Damewood		Eugene Water & Elec. Board	Water Provider
Jim Doane		State Board: Examiners for Eng. & Land Surveying	State Agency
Michael Doane		Interested Individual	Oregon Citizen
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Jeff Leighton		Portland Water Bureau	Water Provider
Arturo Leon, Ph.D.		Oregon State University	University
Ian Madin		DOGAMI	State Agency
Jim Male		University of Portland	University
Jim Newell		Degenkolb Engineers	Engineer
Bob Patterson		City of Pendleton	Water Provider
Sherry Patterson		Rivergrove Water Dist	Water Provider
Todd Perimon		AECOM	Engineer
Brad Phelps		CH2M-Hill	Engineer
Jeff Rubin		Tualatin Valley Fire and Rescue	Local Government
Rob Schab		Coos Bay - North Bend	Water Provider
Ken Schlegel		Clean Water Services	Waste water
Brian Stahl		City of Gresham	Water Provider
Jeffrey H. Winchester		Salem Public Works	Water Provider
Kent Yu		OSSPAC	State Agency