



Encouraging Homeowner Resilience through Earthquake Insurance and Seismic Retrofit

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For: THE STATE OF OREGON
Mike Harryman, State Resilience Officer



Oregon Seismic Safety Policy Advisory Commission

After the Loma Prieta earthquake in 1989, Oregon residents demanded that the State of Oregon better address earthquake hazards throughout the state. The state legislature established the Oregon Seismic Safety Policy Advisory Commission (OSSPAC) in 1991 through Senate Bill 96. The Commission is a group of eighteen individuals each appointed by the Governor. They represent a variety of interests regarding public policy and earthquakes, including representatives of many state agencies, a member each from the Oregon House and Senate, representatives of important stakeholder groups, and members of the public. The OSSPAC mission is to positively influence decisions and policies regarding pre-disaster mitigation of earthquake and tsunami hazards, increase public understanding of hazard, risk, exposure and vulnerability through education, and be responsive to new studies or issues raised around earthquakes and tsunamis.

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preface

In June of 2017, Senate Bill 850 was adopted by the Oregon Legislature and signed by the Governor. It directed the Oregon Seismic Safety Policy Advisory Commission (OSSPAC) to form committees to review policy options, existing reports and studies by state agencies, and prepare recommendations for policy measures on two key subjects important to Oregon’s resilience. One study was focused on how to protect lives and preserve residential housing following a major earthquake or tsunami event. The second was aimed at protecting lives during and after a major earthquake or tsunami event, including but not limited to policy measures to address mass care and mass displacement strategies.

This report focuses on an evaluation of the earthquake insurance market for homeowners in the State of Oregon, ways to improve the uptake of earthquake insurance, and mitigation strategies to increase the resilience of Oregon and allow homeowners to stay in their residences.

Throughout this report, the term “Cascadia event” is used to represent the Cascadia Subduction Zone earthquake and resulting tsunami, and the term “earthquake insurance” refers to homeowner earthquake insurance. Also, the discussion pertains only to Oregon unless specific mention is made of other states and their earthquake insurance programs.

In gathering input for this report, the Insurance Working Group of OSSPAC consulted with the State Resilience Officer and engaged other state, local, and Tribal government officials. A small task force designed and held stakeholder workshops dedicated to each topic area at various locations throughout the state. Testimony was gathered from representatives of non-governmental organizations, private industry, insurance companies, and members of the public.

OSSPAC received organizational support from the Department of Consumer and Business Services, especially the Division of Financial Regulation. OSSPAC gratefully acknowledges the financial support of the Department of Consumer and Business Services, Oregon Health Authority and the Office of Emergency Management.

Jay Raskin
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executive summary

In 2017, the Oregon Seismic Safety Policy Advisory Commission (OSSPAC) was tasked by the Legislative Assembly through Senate Bill 850 to form a committee to review policy options, existing reports and studies by state agencies, and prepare recommendations for policy measures to protect lives and preserve residential housing following a major earthquake or tsunami event. Through stakeholder meetings and testimony, OSSPAC investigated the earthquake insurance market for homeowners in the State of Oregon, ways to improve the uptake of earthquake insurance, and mitigation strategies to increase the resilience of Oregon and allow people to stay in their residences after a major earthquake. The commission's major finding and recommendations are as follows:



Major Findings

- A. **Oregon has a very competitive earthquake insurance market with a large number of carriers.** While large earthquakes have not occurred as frequently as in California and Washington, Oregon has larger uptake of earthquake insurance policies than either of those states. Oregon also has a wide variety of products at a wide range of cost points, and the prices for similar insurance appear more affordable in Oregon than in California. On the whole, Oregon is doing well and is at or above its West Coast peers in terms of uptake. However, the Commission has concerns about insurance companies discontinuing their business in Oregon after a Cascadia event. It is not recommended that the State pursue a State Earthquake Authority or similar agency at this time.
- B. **Earthquake insurance is not as resilient as retrofitting.** Insurance does nothing to prevent earthquake damage from occurring. Insurance does not allow people to stay in their homes and avoid reliance on scarce shelter space. The State should focus less on increasing earthquake insurance uptake and more on seismic retrofit of single-family homes. Retrofitting homes is a more resilient approach, and it often reduces the losses several times over. It allows people to return to work, kids to return to schools, and normalcy to return to the population, enabling quicker recovery of the state.



Recommendations

- A. **Direct the Office of Emergency Management to create a public information campaign.** The campaign should educate consumers about the threat of a Cascadia or localized fault event, potential damage to high-risk houses, and the benefits of seismic retrofits. It should focus on how consumers can prepare for major events and include information on insurance. Information regarding earthquake insurance should target homeowners who would derive the greatest benefit, including those with coastal homes outside the tsunami inundation zone and homes with particular features that have been shown to suffer more damage on average.
- B. **Direct the Department of Consumer and Business Services to create educational products for consumers.** The products should explain earthquake riders and provide advice about speaking to insurance agents about earthquake products.
- C. **Direct the Department of Consumer and Business Services to investigate ways to allow alternate insurance models to be sold in Oregon.** This could be done through a “regulatory sandbox” type pilot

program. A “sandbox” allows firms to experiment by offering innovative financial products and services within a clearly defined space, under specific regulatory conditions, and for a limited time period. Emphasis should be placed on products that cover a variety of risk profiles and recognize that speed of payment can have clear benefits to a post-earthquake economic recovery.

- D. **Direct the Department of Consumer and Business Services to adopt a consistent, statewide design standard for the seismic retrofit of single-family structures.** The standard could be the City of Portland’s Prescriptive Path code regulations, Chapter A.3 from the State of California’s Title 24 for cripple-wall buildings, FEMA P50.1, the ATC-110 Pre-Standard, or a similar standard. The standard adopted should be based on a national consensus standard that is regularly reviewed and updated as new research is developed. It should be as prescriptive as possible to allow homeowners to successfully carry out the seismic retrofit of their own homes with minimal engineering required. It should also have a defined performance objective to assist projects that do not fit the prescriptive requirements and must be engineered by a registered professional.
- E. **Direct state organizations to conduct additional research into development of prescriptive retrofit guidelines for alternate types of single-family homes, including slab-on-grade construction, homes on full basements, and homes on sloping foundations.** Per Senate Bill 33, the State should appropriate at least \$1M to the Department of Geology and Mineral Industries, the Office of Emergency Management, or state universities for this effort. Direct the DCBS to review and adopt alternate and expanded prescriptive path code provisions for other major types of residential structures, as they become available.
- F. **Direct the Department of Consumer and Business Services (DCBS) to instruct building departments throughout the state to check the drawings and any calculations for all seismic retrofits of single-family homes.** This will ensure adequate/minimum performance is met once a uniform seismic retrofit standard is adopted. Direct DCBS to develop a Certificate of Adequacy program to give homeowners assurance and proof that the retrofit is done in accordance with the required standard and is transferable to future owners of that structure.
- G. **Incentivize the seismic retrofit of older single-family homes.** Investigate the use of a state tax credit similar to the home energy tax credits from the Energy Trust of Oregon to help homeowners finance the cost of seismic retrofits. Investigate using the state’s bonding authority to provide need-based grants and institute a matching grant program to help finance the cost of seismic retrofits for homeowners. Direct the State to partner with local nonprofits such as Enhabit or Habitat for Humanity to seismically

retrofit houses for low-income Oregonians. Partner with Oregon cities, counties, and local NGOs to start expanded residential Property Assessed Clean Energy-type programs in their communities to fund seismic and sustainability upgrades for homeowners.



chapter one

The Current Earthquake Insurance Market

The Division of Financial Regulation (DFR) surveyed 15 major insurance groups. They represented 91.4% of the homeowner policies sold in Oregon in 2016. Thirteen of those groups also offered earthquake coverage. The 15 insurance groups consist of 57 companies that sell homeowners insurance, plus two specialty insurers that do not offer homeowners insurance but do sell stand-alone earthquake or other catastrophic risk insurance. They are all part of the “admitted” market, which means that they are registered with the state and directly regulated by the Department of Consumer and Business Services. This group includes companies that most homeowners are familiar with and include the big national companies selling home, auto, and life insurance. The market share of the companies included in the DFR survey of earthquake coverage is shown in Figure 1.1.

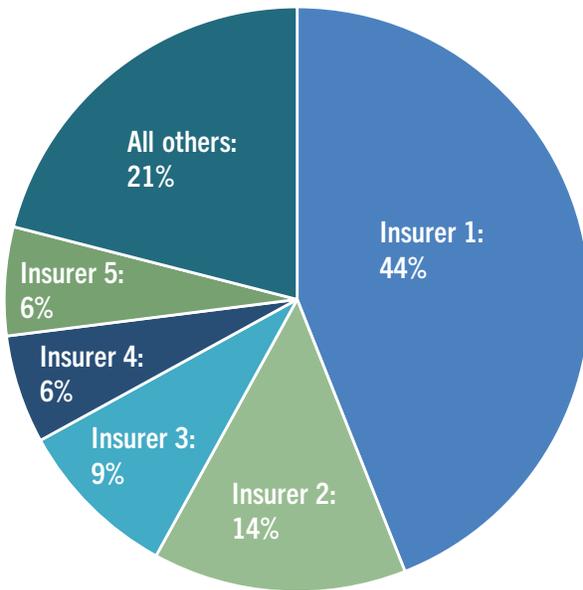


Figure 1.1: 91.4% of Market Share of Earthquake Coverage in Oregon in 2016; data from DFR

If a home is deemed high risk, the homeowner may not be able to obtain insurance through the admitted market. Their alternative would be to seek insurance through the “non-admitted” market, also referred to as “surplus lines.” Coverage through non-admitted providers is often significantly more expensive due to the higher risk, and it is regulated differently by the State.

Risk Modeling

Large insurance companies have different methods for developing their portfolio risk profiles, creating pricing models for individual properties, and concentrating risk in geographical areas. Some companies have their own internal modeling group. Several use third-party risk modeling companies like AIR, Corelogic, and Risk Management Solutions (RMS). Their risk models are not open to the public, but according to testimony from RMS, they are sophisticated and based on current best practices. They include the latest hazard modeling from the United States Geological Survey (USGS), soils data from the National Earthquake Hazards Reduction Plan (NEHRP), and custom fragility curves based on NEHRP’s loss estimation software HAZUS. Analyses are fully probabilistic. While these companies provide risk data to

insurance companies, it is completely up to the insurance company whether or not to use the information when making decisions about coverage and policy pricing.

Coverage Criteria

When considering coverage, companies look at house characteristics, including the age, size, number of stories, location, and foundation type. In general, these variables only slightly impact the price of insurance, and most companies collect only basic information about a house before issuing an earthquake policy. The variable with the most impact on the cost of insurance is the age of the house.

For older homes that have not been seismically retrofitted, earthquake coverage is available through some but not all companies. The cost of policies for non-retrofitted homes does not always match their greater loss potential, as is prevalent in California. Some companies will not issue earthquake insurance unless the home has been retrofitted, although there does not appear to be a clear or consistent standard for determining if the home has been properly retrofitted. Some companies require photos, an inspection, a permit, or other documentation, and others do not.

Coverage Inclusions

Earthquake insurance covers some losses and damage caused by an earthquake, as well as contents and loss of use. Its main objective is to put roofs back over people's heads. It does not aim to replicate pre-disaster conditions or enhance post-disaster seismic performance. For example, it covers replacement of finishes but not identical historic finishes. Plaster walls in older homes would be replaced with drywall. Code upgrades that may be required in order to rebuild are not covered except in the most expensive policies that include a specific "code upgrade" provision.

Homes in the tsunami inundation zone may require both earthquake and flood insurance, as earthquake insurance only covers damage from strong shaking and not water damage from a tsunami. Tsunami damage is covered by private flood insurance or the FEMA National Flood Insurance Program, which is available to homes inside and outside the designated FEMA flood plain. The flood plain line is not the same as the tsunami inundation line, but in most cases it is very close.

Policy Pricing

The Division of Financial Regulation conducted a survey of Oregon residential earthquake policies sold in 2016 that found that deductibles range from 2.5% to 25% of the earthquake insurance policy limit. Within that range, 10% was by far the lowest deductible offered by most insurers and the highest deductible

was split almost 50-50 between 20% and 25%. Premiums for policies with lower deductibles are more expensive than policies with higher deductibles. Unlike other types of homeowners insurance, such as fire, the deductible is calculated on the full value of the home and not on the amount of loss. Therefore, the deductible must be paid by the homeowner before the insurer will issue any payments.

Ranges of premiums for Oregon and California are shown in Figure 1.2 for various levels of deductibles. As can be seen in the figure, insurance premiums in California are much higher than in Oregon.

Some insurance companies offer a small discount (often around 15%) for houses that are seismically retrofit. This is not a significant savings, so the payback period on the cost of a retrofit is very long. For example, a 15% discount on a policy that costs \$400/year would be \$60/year. For a typical seismic retrofit, the payback period would be 92 years. Return on investment for seismic retrofits is discussed in more detail in Chapter 3.

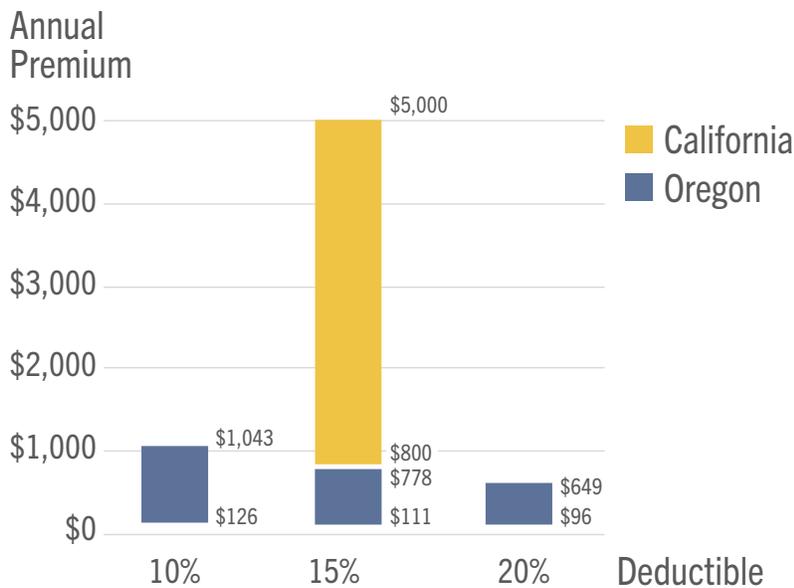


Figure 1.2: Range of Earthquake Insurance Premium Costs in Oregon and California

Insurance Uptake

To understand earthquake insurance uptake in Oregon, the Department of Consumer and Business Services (DCBS) Division of Financial Regulation (DFR) conducted a survey of the top 15 admitted insurance groups (comprised of 57 separate companies) offering residential homeowners insurance, as well as two specialty insurers that offer stand-alone earthquake coverage. The survey represented 91.4% of homeowners insurance written premium in 2016.

The survey found that 14.9% of Oregon homeowners insurance policy holders also have earthquake insurance. This is down from 18.9% in 2014, though some of this difference may be attributed to different survey methodologies. Oregon's overall rate is higher than California's (which is between 10.8% and 15.1%) and Washington State's (11.3%).

Uptake rates were not consistent throughout Oregon. Only 13% of homeowners along the Coast have earthquake insurance, compared to 17.2% of homeowners in the Willamette Valley (see Figure 1.3). The data can also be broken down by individual county (see Table 1.1 and Figure 1.4). It is clear that uptake is higher in urban centers with a larger concentration of single-family homes than in more rural counties.

In California, the California Earthquake Authority provides over 80% of the earthquake insurance coverage. In Washington, two companies provide over 50% of the earthquake insurance policies, which represent more than 50% of the overall exposure. The risk is slightly more spread out in Oregon, with the largest insurance group representing 43% of the policies and the top five companies representing 79% of the surveyed market. See Figure 1.1.

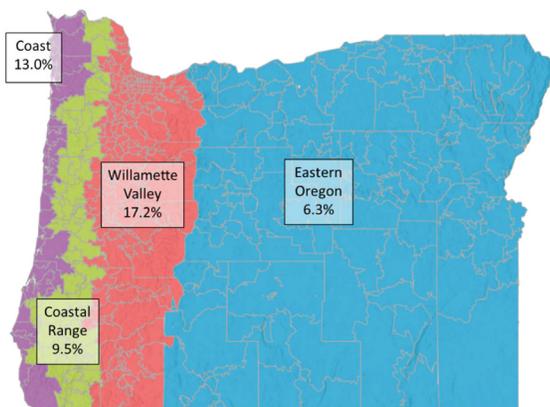


Figure 1.3: Uptake Percentage by ORP Zone; data from DCBS

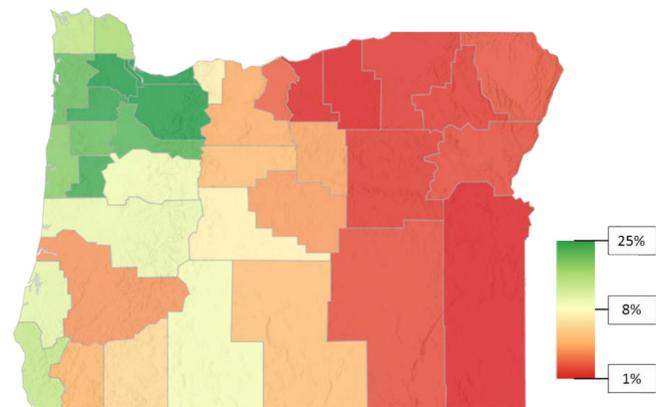


Figure 1.4: Uptake Percentage by County; data from DCBS

County	Total Homeowner's Policies	Policies with Earthquake Coverage	% with Earthquake Coverage
Baker	5,221	160	3.1
Benton	20,750	3,422	16.5
Clackamas	105,174	21,920	20.8
Clatsop	13,738	1,726	12.6
Columbia	13,819	1,934	14.0
Coos	18,401	2,065	11.2
Crook	6,335	339	5.4
Curry	8,699	1,115	12.8
Deschutes	60,774	5,228	8.6
Douglas	27,801	1,349	4.9
Gilliam	468	11	2.4
Grant	2,064	55	2.7
Harney	1,794	55	3.1
Hood River	5,837	485	8.3
Jackson	56,454	3,975	7.0
Jefferson	7,211	464	6.4
Josephine	21,684	1,223	5.6
Klamath	18,461	1,817	9.8
Lake	1,991	122	6.1
Lane	94,483	9,532	10.1
Lincoln	19,546	2,926	15.0
Linn	33,883	3,431	10.1
Malheur	5,102	74	1.5
Marion	75,783	12,616	16.6
Morrow	2,192	45	2.1
Multnomah	188,137	34,276	18.2
Polk	20,272	3,208	15.8
Sherman	517	19	3.7
Tillamook	13,290	2,072	15.6
Umatilla	16,443	430	2.6
Union	6,339	167	2.6
Wallowa	2,295	79	3.4
Wasco	7,254	403	5.6
Washington	140,947	35,542	25.2
Wheeler	419	23	5.5
Yamhill	25,209	4,309	17.1
Total	1,048,787	156,617	14.9

Table 1.1: Percent Uptake of Earthquake Insurance by County; results by DCBS Insurance Call

Potential Issues

The Commission closely examined the pricing and availability of policies in Oregon as compared with those in California, as well as the number and concentration of those policies. While the rates are reviewed by the State, it is not clear that Oregon prices are aligned with the risk presented by Cascadia. The Commission believes that when a major Cascadia event occurs, there is danger that many (if not most) of the insurance carriers in Oregon will no longer offer policies in the state, and Oregon will find itself in the same situation as California after Loma Prieta in 1989 (see Chapter 4).



Chapter 1 Major Findings

Oregon has a very competitive earthquake insurance market with a large number of carriers. While large earthquakes have not occurred as frequently as in California and Washington, Oregon has larger uptake of earthquake insurance policies than either of those states. Oregon also has a wide variety of products at a wide range of cost points, and the prices for similar insurance appear more affordable in Oregon than in California. On the whole, Oregon is doing well and is at or above its West Coast peers in terms of uptake. However, the Commission has concerns about insurance companies discontinuing their business in Oregon after a Cascadia event. It is not recommended that the State pursue a State Earthquake Authority or similar agency at this time.



chapter two

Increasing Earthquake Insurance Uptake

Many homeowners who currently have earthquake insurance actively sought it out. While most companies that offer it advertise it on their websites, some are doing a better job than others of marketing it. That being said, earthquake policies are relatively affordable and available in Oregon. If a consumer can afford it and wants to purchase it, it is relatively easy to obtain. However, there are a number of reasons why people don't purchase it.

Low Earthquake Awareness

Many Oregonians lack basic knowledge about the Cascadia Subduction Zone and the threat that it poses to our region. There has been a fair amount of press on the topic since the earthquakes in Japan and New Zealand in 2011 and the Pulitzer Prize winning article by Kathryn Schulz in the New Yorker Magazine

in 2015. Yet there are still many who don't understand the likelihood of a major earthquake or the tremendous social and financial costs it will bring to large regions of the state. They also don't often understand the likelihood of their individual home being damaged, the cost and time it may take to rebuild their home, or the fact that it may be difficult to find adequate shelter for their family immediately after the event.

Barriers to Purchasing Earthquake Insurance

Purchasing insurance is not something that consumers do very often. Some people lack any experience or have poor past experiences with insurance. Oregon's Plain Language Law governs public writing by state agencies, but it does not cover insurance contracts. Consumers are often confused by insurance contracts. They may not understand exclusions in their policies or the risks to which they are subject. For example, some may not be aware that their homeowners insurance does not automatically cover earthquakes and that an additional policy is required. Unlike fire insurance, which is required by most mortgage lenders in Oregon, each homeowner must choose whether or not to purchase earthquake insurance. Consumers need help to guide them in purchasing earthquake insurance, to understand what options they have, and know what questions they should ask their agent.

Price and perception of value can also prevent homeowners from purchasing earthquake insurance. Many consumers believe it is a waste of money to buy insurance for all possible disasters, including a very rare event that may not happen within their lifetimes. And at up to \$1,000 a year, the premiums are out of reach for some. Because there is low uptake, the economic risk to insurance companies is concentrated on a small pool of homeowners with similar risk profiles, and deductibles are usually much higher (10-20% for earthquake vs. about 2% for fire).

Why Many Homeowners Don't Purchase Earthquake Insurance

- Lack of awareness about risks of a Cascadia event
- Lack of understanding around homeowner insurance policies and exclusions
- Perception that it's a waste because the earthquake may not happen in their lifetime
- Perception that it's a waste because the damage may not exceed the deductible
- Insurer requires a retrofit, which the homeowner can't afford

Because deductibles are potentially higher than the loss an earthquake will create, many choose not to purchase it. Some homeowners who want it are denied earthquake insurance because their homes are not retrofitted, and they may not have the capital to retrofit their home. Finally, some homeowners believe that FEMA will provide financial support for damaged homes. They are likely not aware of the requirements, timelines, and maximum payout of FEMA assistance. It is important for homeowners to understand the benefits and risks of purchasing earthquake insurance, as well as the value of seismic retrofits.



Chapter 2 Recommendations

Direct the Office of Emergency Management to create a public information campaign. The campaign should educate consumers about the threat of Cascadia and localized faults, potential damage to high-risk houses, and the benefits of seismic retrofits.

Direct the Department of Consumer and Business Services to create educational products for consumers. The products should explain earthquake riders and provide advice about speaking to insurance agents about earthquake products.



chapter three

Return on Investment

OSSPAC performed analyses on the return on investment (ROI) for earthquake insurance. Insurance is not an investment per se, rather it is a pooling of premiums to pay for losses by individual contract holders. However, it does have costs and benefits that can be calculated for different scenarios. The analysis was undertaken not to provide direction to individual homeowners but to explore issues with earthquake insurance uptake and to develop State priorities. It is based upon averages including home value, as well as expected loss frequency and severity. It does not represent any individual house within the State.

The Oregon Department of Geology and Mineral Industries (DOGAMI) provided loss-estimate data for a Cascadia earthquake from its 2018 Earthquake Impact Analysis, which studied Multnomah, Washington, and Clackamas counties. The Task Force extrapolated those findings to the rest of the state. It looked at single-family dwellings and explored a number of variables to determine ROI, including:

- Insurance deductibles
- Geographic region of the state (using same regions as Oregon Resilience Plan)
- Value of building and contents
- Age of home and corresponding level of code (see Table 3.1)

Building Type	Year Built	Design Level
	Prior to 1976	Pre Code
Single Family Dwelling	1976–1991	Low Code
(includes Duplexes)	1992–2003	Moderate Code
	2004 - Present	High Code

Table 3.1: Benchmark Years Used for HAZUS Analysis; data from DOGAMI

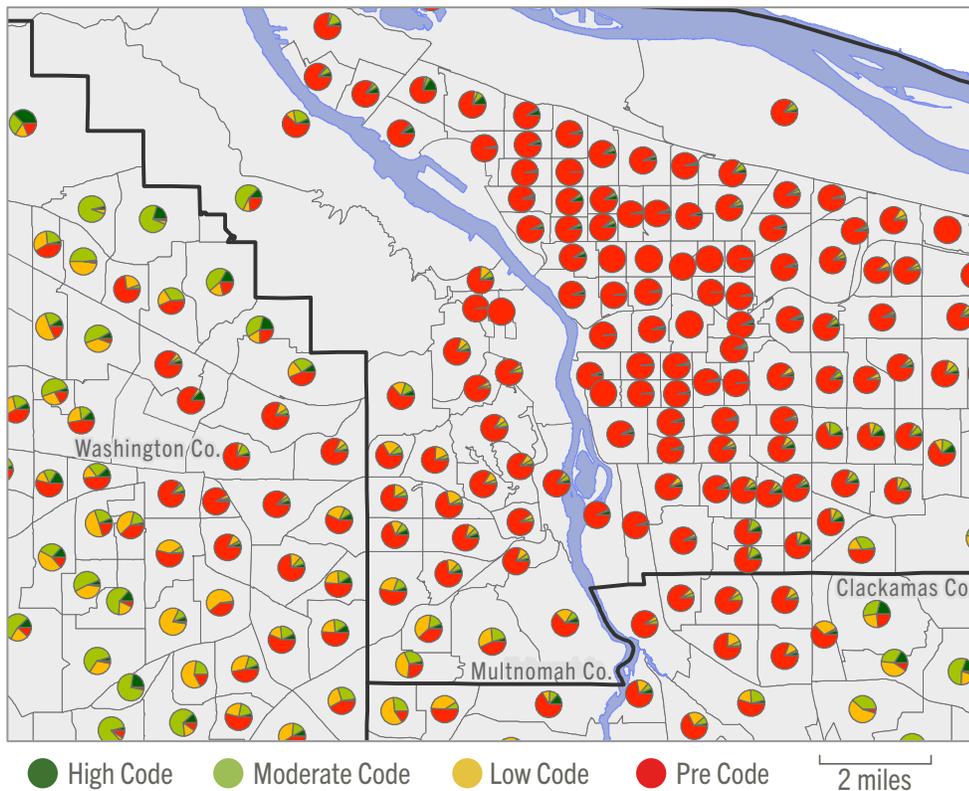


Figure 3.1: Ratio of Pre-, Low-, Moderate-, and High-Code Single-Family Homes for Census Tracts in Washington, Clackamas and Multnomah Counties. Thin outlines are census tracts. Tracts with fewer than 100 homes are not shown with the pie chart symbology; data from DOGAMI

According to the DOGAMI analysis, loss estimates are greatest for pre-code homes and those along the Coast (See Table 3.2). The average earthquake loss for a pre-code home ranges from 0.6% in Eastern Oregon to 3.8% in the Willamette Valley to 15.5% at the Oregon Coast. The loss estimations are averages for all of the homes in each of the four regions of the state. Loss estimates for an individual house vary considerably.

ORP Zone	Pre-Code	Low Code	Medium Code	High Code
Eastern Cascades	0.6%	0.4%	0.3%	0.2%
Willamette Valley	3.8%	3.0%	2.0%	1.6%
Coastal Mountain	11.0%	8.1%	4.6%	3.6%
Coastal	15.5%	10.9%	6.0%	4.5%

Table 3.2: Loss Results from HAZUS Analysis of Single-Family Homes; data from DOGAMI

Unless the homeowner’s deductible is less than the estimated loss by at least a few points, the ROI for earthquake insurance will not be positive. This is especially true in the Willamette Valley. Even on the Oregon Coast, only policies with the lowest deductibles (e.g. 5% to 10%) will experience damage amounts that exceed the deductible limit.

For all regions in the State, if the predicted damage is less than the percent of insurance deductible, homeowners will not receive a damage payout. Alternatively, losses for homes at the Coast that will be impacted by strong shaking but not a tsunami will be higher than 15% on average, making those homes good candidates for earthquake insurance from a positive return on investment perspective. In addition, there are homes throughout western Oregon that include features that are likely to contribute to significant damage, and they are all good candidates for earthquake insurance (see Sidebar for examples).

Home features likely to contribute to significant damage in an earthquake:

- Pre-code homes that are not retrofit
- Homes on hillsides, sloping sites, and stilts
- Homes on weak or loose soils, or sandy soils susceptible to liquefaction
- Homes with unreinforced masonry construction or poorly-attached masonry veneer
- Homes with irregular configurations (such as split-level homes or L-shaped plans)

Based on OSSPAC’s analysis, it is clear that earthquake insurance will only help reduce the financial burden of rebuilding for some Oregon homeowners. Many homes are not expected to bring a positive return on investment for earthquake insurance.

Retrofit Return on Investment

OSSPAC also performed analyses on the return on investment (ROI) for seismic retrofits. The analysis was based on testimony from Enhabit, a nonprofit that has completed seismic retrofits in the Portland Metro area. Based on their experience, the average cost of a seismic retrofit of a single-family wood home is approximately \$5,500 (see Figures 5.1 and 5.2).

Retrofits of pre-code and low-code single family homes reduce earthquake damage in every region of Oregon. The reduction of damage is between 25% in Eastern Oregon and 60% along the Coast. There is no positive ROI for retrofitting medium- and high-code homes (i.e. homes built after 1992), since they are considered “new” and retrofitting would have little to no impact on reducing earthquake damage. There is also no positive ROI for retrofitting homes in Eastern Oregon since they will not suffer much, if any, damage in a Cascadia event.



Chapter 3 Recommendations

Direct the Office of Emergency Management to target earthquake insurance education to homeowners who would derive the greatest benefit. This includes homeowners in Coastal communities that are not in the tsunami inundation zone and homeowners that have homes with particular features that have been shown to suffer greater damage in an earthquake.

Encourage homeowners to retrofit their older single-family homes. The return on investment for retrofits of pre-code and low-code homes is very positive throughout all regions of the state.



chapter four

Alternate Insurance Approaches

California has the largest earthquake risk on the West Coast. In 1984, California passed a “mandatory offer” law that required any company offering homeowners insurance in the state to also offer earthquake insurance. Coverage was cheap and uptake rates were very high. In 1994, the Northridge Earthquake resulted in direct losses of \$24.7B, approximately half of which were residential (\$12.6B). Roughly 50% of the homeowners had earthquake coverage.

Due to heavy losses from the earthquake, insurance companies began to leave the California market, and homeowners struggled to find insurance. The California Earthquake Authority (CEA) was created in 1996 to solve the crisis. The CEA is a privately-funded, publicly-managed organization that sells California earthquake insurance policies through participating insurance companies.

When a California consumer purchases homeowners insurance, they have the option to purchase an earthquake rider through a participating CEA company. The CEA owns the policy, holds the risk, and provides the payouts, but they do not have agents or adjusters. The participating insurance company handles accounts and processes claims.

Since few companies elect to compete with CEA to sell earthquake insurance, the CEA holds approximately 80% of the market. They currently have roughly 950,393 policyholders, which is about 10.8% of all homeowners in the State of California. The CEA has 140 employees and is moving toward making most of them state employees.

About four years ago, the State of California instituted a program to encourage retrofits. The CEA is required to put 5% or \$5 million of investment income into a fund for all California homeowners, regardless of insurance coverage through the CEA. Currently, the fund holds approximately \$25 million for a retrofit program targeting cripple-wall construction. Rebates are available for single-family homes and homes with up to four units, and they are capped at \$3,000 each. When retrofits are completed, the participating insurers discount the homeowner's earthquake insurance premiums.

The CEA is regulated by the California Insurance Commission. It is governed by a board of directors that includes the Governor, Treasurer, and Insurance Commissioner. CEA operations are costly. It is not subsidized by the state or federal government, and there is no federal "backstop" like there is for other natural hazards in the United States. They are required to operate in a financially sound manner and to anticipate increases in reconstruction costs due to inflation.

Initial funding for the CEA came from seed money contributed by the large insurers that signed up to participate. They have approximately \$5B in available capital, \$5B in re-insurance, and \$680M in proceeds from revenue bonds. In addition, they have the authority to collect additional assessments of approximately \$2B after the earthquake, if necessary.

The CEA is very successful at marketing its products. They saw huge increases in homeowners seeking coverage after their 2015-2016 plan was in place. They do a great deal of advertising on television, radio, and social media to educate homeowners regarding earthquakes risks and sell insurance. Their motto is "educate, mitigate, insure."

The CEA's marketing budget for increasing awareness and its excellently funded program for seismic retrofitting of homes is enticing. However, at this time the Commission does not see a need to create a major new bureau to underwrite earthquake insurance for Oregon homeowners. There are plenty of companies providing insurance, a higher percentage of Oregonians have insurance than Californians, and the price for coverage is significantly lower than in California. When Oregon suffers considerable losses after a Cascadia event and the insurance marketplace inevitably reacts and adjusts, the State can evaluate whether such an Earthquake Authority is desirable or appropriate.

Parametric Insurance

Many homeowners won't purchase traditional earthquake insurance because damage to their homes may not exceed its high deductibles. Additionally, it does not help in the immediate aftermath of a disaster when personal income is halted, critical needs must be met, and insurance payouts are still months or years away. New insurance products are trying to fill these gaps.

Parametric insurance is intended to help bring normalcy to people's lives and addresses "life disruption," as opposed to focusing solely on property damage. It provides a pre-defined payout when a certain level of ground shaking is recorded at a specific location. There is no claim adjustment process, which allows payouts to happen almost immediately after an event occurs. Policies are inexpensive, there is no deductible, and payouts are relatively modest. A \$20/month policy would pay approximately \$10,000 after a qualifying event.

It is clear that such a product could have positive benefit to any Oregonian concerned with post-earthquake life disruption, including renters. It could also be a good choice for a large number of homeowners experiencing small losses. However, this new product is untested in the regulatory environment. Some Commissioners question whether the "insurable interest" criteria is being met, as the requirement to show loss is done electronically rather than through a claims adjuster. Additionally, some question whether \$10,000 will have a profound enough impact on a homeowner's ability to rebound after a Cascadia event. Minor home repairs can reach that amount very quickly. So far, the only company offering these policies in California has testified to the Commission that they will not allow more than \$10,000 worth of coverage per policyholder.

It is clear that some homeowners need traditional earthquake insurance and some could benefit from current parametric insurance products, if they became available. But there is potential to develop additional products that better target homeowners' needs for a Cascadia event. Data from Northridge

The Regulatory Sandbox – A Trial Run for New Products

A “regulatory sandbox” allows insurance companies to experiment by offering innovative financial products and services within a clearly defined space and for a limited time period. The number of products, customers, and transactions are limited.

A company must be approved to operate in the sandbox. Companies may not be required to comply with some standard regulations, but there are certain conditions and safeguards in place. Companies are required to clearly explain to customers that they are participating in the experiment, and they must clearly define the risks. Customers must clearly and actively agree to the conditions.

indicates that while the residential losses were large in aggregate, the average loss to individual homeowners was modest and often less than their insurance deductible. Many homeowners could benefit from a parametric-style product with low fees and deductibles that allows for payouts higher than \$10,000. Not only would this provide a stop-gap solution for homeowners, it would also boost resilience for the hundreds of thousands of Oregonians who rent their homes.



Chapter 4 Major Findings

At this time, the Commission agrees that the State should not pursue creation of a State Earthquake Authority or similar agency.



Chapter 4 Recommendations

Direct the Department of Consumer and Business Services to investigate ways to allow alternate insurance models to be sold in Oregon. This could be done through a “regulatory sandbox” type pilot program. Emphasis should be placed on products that cover a variety of risk profiles and recognize that speed of payment can have clear benefits to a post-earthquake economic recovery.



chapter five

Resilience Through Retrofits

Earthquake insurance does nothing to prevent earthquake damage from occurring, and it does not contribute to life safety. Before the 2011 earthquakes in Christchurch, a large percentage of homeowners and businesses were covered by earthquake insurance. The claims process was often slow. In fact, not all claims have been settled even five years after the event. But by-and-large, the system worked as it should, and many businesses and homeowners received settlement payments totaling \$26B. However, such high levels of insurance coverage did nothing to prevent the loss of 185 lives or the injury of thousands. And it did not prevent the complete loss of roughly 1,250 buildings, which constituted nearly a quarter of the buildings in the city's central business district.

Earthquake insurance also does not allow people to shelter-in-place in their lightly damaged houses and avoid reliance on scarce shelter space. Getting a settlement can take months or years. Owners must find contractors and obtain permits in a market with severe supply chain issues. Data from building permits issued after the Northridge Earthquake indicates that most rebuilding happened quickly, peaked three months after the event, continued steadily for another 13 months, and then declined. After 12 additional months and over two years after the initial event, it reached pre-earthquake permit activity level. It is clear that the time needed to rebuild can vary greatly depending on a homeowner's means and circumstances. For those with adequate savings or other financial resources, the process may take only from three to six months. For those with more limited resources, it can take significantly longer.

While earthquake insurance can help homeowners recover financially, it does not contribute to resilience nearly as much as mitigation. Increasing the number of retrofits protects lives and keeps people in their communities, which contributes to their physical, mental, and social well-being. It decreases the burden on shelters and reduces mass displacement and relocation.

Lack of Consistent Standards

There is no consistent statewide standard for the design of seismic retrofits. As a result, contractors can come up with radically different solutions which can result in a wide variation in performance. This creates public confusion and mistrust. It also causes frustration for retrofit providers, as there is no level playing field for their product and pricing. And it creates trouble for examiners and inspectors, since there is no clear way to enforce a design standard and ensure proper performance.

Prescriptive code provisions for single-family home retrofits exists elsewhere, and most of them are very effective. The City of Portland's "prescriptive path" code provisions and California's Chapter A.3 provisions have been in use for many years and have been well-tested and vetted. However, these standards only address cripple-wall homes, which comprise a small percentage of the older homes in Oregon. They do not address many typical types of residential construction, such as slab-on-grade homes, homes with full basements, or homes on sloping foundations. In 2014, the SB33 Task Force recommended increasing funding for research in developing cost-effective retrofits of structures. The Commission agrees with this recommendation, which has not yet been implemented.

Several new standards for retrofitting homes have been funded in the past few years, including FEMA P50.1 and the ATC-110 Pre-Standard. These standards are preferable to older ones, as they are developed using a national consensus process and will likely be regularly reviewed and updated as new research is developed. It is important that any standard adopted consider both simple homes that can be successfully retrofit using prescriptive plan sets as well as complex homes that require retrofits to be engineered. Ideally, the standard should enable homeowners to retrofit their own homes with minimal engineering. But it should also have a defined performance objective to assist projects that do not fit the prescriptive requirements and must be engineered by a registered professional.

Public Perception of Retrofits

Public perception of seismic retrofitting is often negative. Homeowners express frustration with the lack of transparency around standards and consistency among contractor opinions. There is no certification or special licensing for retrofit contractors, and there is no requirement for them to include stamped and signed drawings and calculations. There is often little review or oversight by the various building departments. Work is typically approved as long as it doesn't make the building "worse." Homeowners have little, if any, assurance that retrofits will actually work.

Value and Affordability

According to the ROI analysis done by OSSPAC, retrofitting reduces earthquake loss anywhere from 25% to over 60%. Even in an area of lower seismicity, the ROI for a retrofit is usually positive, and it can be very high in areas of high seismicity, such as the Coast. Compared to other standard capital investments, such as replacing siding, paint, a furnace, or a roof, retrofits pose a relatively low burden for homeowners.

However, many homeowners may not perceive retrofit to be a value because the investment may not pay back in their lifetime. Enhabit and other professional retrofit contractors estimate that the average cost to retrofit a single-family home is \$5,500 (See Figures 5.1 and 5.2). For many homeowners, that cost is too high, regardless of value.

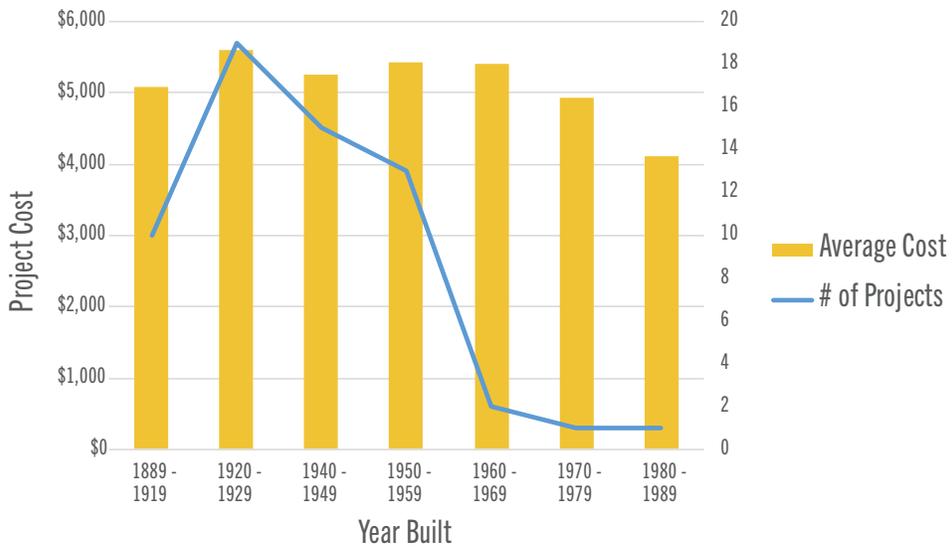


Figure 5.1: 2017 Average Retrofit Cost by Vintage of House; data from Enhabit

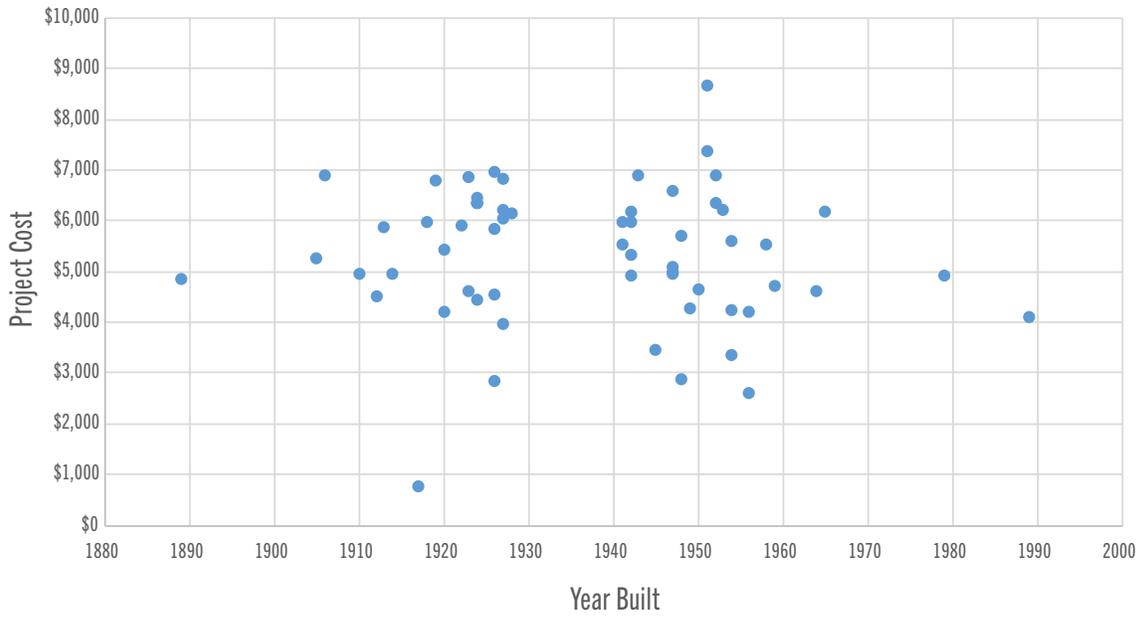


Figure 5.2: Retrofit Cost by Vintage of House; data from Enhabit

Incentivizing Retrofits

No one incentive will encourage every homeowner to retrofit their property. For some, it may simply be a matter of fixing the retrofit “PR problem.” If the public doesn’t know that Oregon is expecting a major earthquake, they can’t be expected to prepare for it. If they can’t trust codes or contractors, and if they aren’t aware of the ROI for their home type and location, they can’t be expected to value and invest in retrofits.

House Bill 2140 requires property sellers to tell buyers whether a home was built before 1974, and if so, whether the house has been bolted to its foundation. This helps raise awareness about earthquake risk and takes us one step closer to normalizing the discussion around retrofits. In time, hopefully homebuyers and their lenders will insist that pre- and low-codes homes are retrofit as a stipulation of sale.

Financial Incentives

Many people will require direct financial incentives to convince them to move forward with retrofits. There are a number of possible incentive models.

1. The State could offer a tax credit similar to the home energy tax credits offered through the Energy Trust of Oregon.
2. The State could partner with local nonprofits such as Enhabit or Habitat for Humanity to seismically retrofit houses. It could use its bonding authority to institute a need-based grant program. Middle-income homeowners could pay 50% of a retrofit, and the State could pay the other 50%. Lower-income homeowners could be offered free retrofits, with the State paying 50% and a nonprofit paying the other 50%.
3. The State could partner with Oregon cities, counties, and local nonprofits to start programs similar to the Property Assessed Clean Energy (PACE) program, which helps finance the cost of upgrades.

Enhabit's Grant Program

Since 2009, Enhabit has been providing home improvement services in Oregon and Washington, including seismic retrofits. In 2014, they received a grant from FEMA and partnered with the Portland Bureau of Emergency Management to seismically retrofit 150 single-family homes. Over 4,000 homeowners applied for the program.

The grant paid for half of a seismic upgrade with a \$3,000 limit per project. The program was not necessarily restricted to low-income homeowners, but it did require that the home value per square foot be less than the median value. In addition, the home had to be suitable for a prescriptive retrofit. Enhabit considers the pilot program a success both in terms of creating resilience, sustainability, and jobs.

PACE Programs

Property Assessed Clean Energy (PACE) programs help finance the cost of residential energy efficiency upgrades. The programs allow a property owner to finance the up-front cost of energy or other eligible improvements on a property and then pay the costs back over time through property assessment. The unique characteristic of PACE assessments is that the assessment is attached to the property rather than an individual. This transfer of burden spreads the costs over a large time span, thus making the upgrades feasible for moderate- and lower-income homeowners. Similar programs could be created for seismic retrofits.



Chapter 5 Major Findings

The State of Oregon should focus less on earthquake insurance uptake and more on seismic retrofit of single-family homes. Retrofitting homes is more resilient and prevents the damage from occurring in the first place. It directly reduces the losses due to the earthquake often with a healthy multiplier. It allows people to return to work, kids to return to schools, and normalcy to return to the population, enabling quicker recovery of the state.



Chapter 5 Recommendations

Direct the Department of Consumer and Business Services to adopt a consistent, statewide design standard for the seismic retrofit of single-family structures. The standard could be the City of Portland's Prescriptive Path code regulations, Chapter A.3 from the State of California's Title 24 for cripple-wall buildings, FEMA P50.1, the ATC-110 Pre-Standard, or a similar standard. The standard adopted should be based on a national consensus standard that is regularly reviewed and updated as new research is developed. It should be as prescriptive as possible to allow homeowners to successfully carry out the seismic retrofit of their own homes with minimal engineering required. It should also have a defined performance objective to assist projects that do not fit the prescriptive requirements and must be engineered by a registered professional.

Direct state organizations to conduct additional research into development of prescriptive retrofit guidelines for alternate types of single-family homes, including slab-on-grade construction, homes on full basements, and homes on sloping foundations. The State should appropriate \$1M to the Department of Geology and Mineral Industries, the Office of Emergency Management, or state universities for this effort. Direct the Building Codes Division to review and adopt alternate and expanded prescriptive path code provisions for other major types of residential structures, as they become available.

Direct the Department of Consumer and Business Services (DCBS) to instruct building departments throughout the state to check the drawings and any calculations for all seismic retrofits of single-family homes. This will ensure adequate/minimum performance is met once a uniform seismic retrofit standard is adopted. Direct DCBS to develop a Certificate of Adequacy program to give homeowners assurance and proof that the retrofit is done in accordance with the required standard and is transferable to future owners of that structure.

Incentivize the seismic retrofit of older single-family homes. Investigate the use of a state tax credit similar to the home energy tax credits from the Energy Trust of Oregon to help homeowners finance the cost of seismic retrofits. Investigate using the state's bonding authority to provide need-based grants and institute a matching grant program to help finance the cost of seismic retrofits for homeowners. Direct the State to partner with local nonprofits such as Enhabit or Habitat for Humanity to seismically retrofit houses for low-income Oregonians. Partner with Oregon cities, counties, and local NGOs to start residential Property Assessed Clean Energy-type programs in their communities to fund seismic and sustainability upgrades for homeowners.



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appendix a

List of Stakeholders

Attendees of the Workshop on Earthquake Insurance held on September 12th, 2017

Sherri Aguirre	California Earthquake Authority
Dennis Burke	Reinsurance Association of America
Lana Butterfield	American Family Insurance
Alex Cheng	DCBS, Div. of Financial Regulation
Jon Christianson	Palomar Specialty Insurance Company
Matt Crall	OSSPAC, DLCDD
Brad Cunningham	Department of Administrative Services
Thomas Cuomo	Surplus Lines Association
Greg Ek-Collins	OSSPAC, ODOT

Jim Frisbie
Laura Hall
Ed MacMullan
Ian Madin
Walter McMonies
Shawn Miller
Trent Nagele
Al Newnam
John Powell

Oregon United Methodist Church
Portland Parents for Preparedness
OSSPAC
OSSPAC, DOGAMI
OSSPAC
Property Casualty Insurers Association
OSSPAC

John Powell & Associates, State Farm

(List of Stakeholders, continued)

Adam Pushkas	OSSPAC
Jay Raskin	OSSPAC
Christian Rataj	National Association of Mutual Insurance Companies
Althea Rizzo	OSSPAC, OEM
Bonnie Robbins	Department of Administrative Services
Steve Robinson	Cascadia Prepared
Melanie Smith	Property Casualty Insurers Association
Jeff Soulages	OSSPAC
Sally Sylvester	DCBS, Support Staff
Aeron Teverbaugh	OSSPAC, DCBS
Eric Timmons	Oregon State Parks and Recreation
Stan Watters	OSSPAC
John Wilson	Department of Aviation
Kate Wood	City of Portland, Risk Manager

Testimony to OSSPAC - January 9, 2018

Steven Patterson	State Farm Insurance
Bill Dow	Hull & Company

Testimony to OSSPAC - March 13, 2018

Janiele Maffei	California Earthquake Authority
Kate Stillwell	Jumpstart

**Attendees of at least one Workgroup Meeting
between October 2017 and August 2018**

Dennis Burke	Reinsurance Association of America
Lana Butterfield	American Family Insurance
Alex Cheng	DCBS, Div. of Financial Regulation
Paul Cosgrove	American Insurance Association
Thomas Cuomo	Surplus Lines Association
Laura Hall	Portland Parents for Preparedness
Ed MacMullan	OSSPAC
Ian Madin	OSSPAC, DOGAMI
Matt Markee	Surplus Line Agents
Walter McMonies	OSSPAC
Shawn Miller	Property Casualty Insurers Association
John Powell	John Powell & Associates, State Farm
Adam Pushkas	OSSPAC
Althea Rizzo	OSSPAC, OEM
Bonnie Robbins	Department of Administrative Services
Steve Robinson	Cascadia Prepared
Jeff Soulages	OSSPAC
Sally Sylvester	DCBS, Support Staff
Aeron Teverbaugh	OSSPAC, DCBS
Alyce Whittow	American Family Insurance

Testimony to OPSPAC - November 14, 2017

Tim Miller	Enhabit
Michael Weber	NW Seismic
Steve Gemmell	EQ Tech

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