HISTORIC PRESERVATION LEAGUE OF OREGON

Special Report

Preserve, reuse, and pass forward Oregon's historic resources

RESILIENT MASONRY BUILDINGS

Saving Lives, Livelihoods, and the Livability of Oregon's Historic Downtowns

Recommendations by the Historic Preservation League of Oregon
based on the 2012 Preservation Roundtable

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The Purpose of the Preservation Roundtable

The Historic Preservation League of Oregon (HPLO) launched the annual Preservation Roundtable in January 2010. The program brings together diverse stakeholders from around the state to address the challenges confronting Oregon's historic places, particularly its Main Streets. In 2010 the Roundtable proposed solutions to create *Healthy Historic Districts*, addressing the issues of economic and cultural viability for Oregon's 123 National Register Historic Districts. The 2011 Roundtable took on *Compatible Infill Design*, recommending principles for new construction in historic districts. Each Roundtable culminates in a Special Report similar to this document.

The Preservation Roundtable process includes background research, expert advice, and the convening of public workshops around the state. With assistance from dedicated volunteers, corporate sponsors, and foundation support, the participation and visibility of the Roundtable has grown steadily since it first convened in 2010. **Over 250 Oregonians participated** in 2012, providing insights and examples that have been incorporated into this document.

The purpose of the report that follows is to highlight the true value of masonry buildings in Oregon, provide an overview of the challenges of preserving this building type, and propose recommendations for making masonry buildings a more productive, more resilient, and more economically viable part of our built environment.

Why This Matters: Lives, Livelihoods, & Livability

Some of the most important historic buildings in Oregon are also the ones most at risk of collapse in an earthquake – if they don't fall victim to hard times or demolition-by-neglect first. Oregon's collection of historic brick, stone, and block structures also happen to house thousands of families, school children, businesses, and government agencies. Officially known as unreinforced masonry buildings (URMs), there are over 5,000 of these structures across Oregon, most of which were built in the late 1800s and early 1900s.[1] While we know that rehabilitation of these buildings can be challenging, the fact is that there are just too many with too much good life left in them for wholesale replacement.

Masonry buildings were constructed to stand the test of time, resistant to fire and flood. They were handsomely crafted, using long-lasting materials with techniques refined over thousands of years. Roughly 75 years ago, building technology advanced to incorporate reinforcing steel. Today, unreinforced masonry buildings still stand as character-defining icons of Oregon's small towns and larger urban centers. The most historically significant of these must be restored, seismically upgraded, and maximized—not out of sentimental nostalgia, but to ensure that lives, livelihoods, and livability are preserved. Oregon simply cannot afford to lose them.

While comprehensive statewide data on the total number and economic value of these buildings has not been collected, we do have enough information to know this issue cannot be ignored. Here are a few reasons:

How many families live in URM apartment buildings?

In Portland alone there are 5,200 units of apartment housing in unreinforced masonry buildings. Statewide there are at least 10,000 people living in URM buildings. Examples include the 35 low-income residents of Corvallis' historic Julian Hotel and the 25 tenants of Astoria's Franklin Apartments.[2]

How many children attend school in URMs?

Across Oregon there are 101 URM schools housing our K-12 students. An additional 673 masonry schools have only limited structural reinforcement. Portland's URM Grant High School alone is home to 1577 students.[3]

How many businesses are housed in URMs?

Across the state there are 81 communities participating in the Oregon Main Street Program to foster community development in older and historic downtowns. In most of these communities unreinforced masonry buildings make up the core of their downtowns, housing scores of businesses and creating a marketable sense of place.[4]

How many fire stations and city halls are in URMs?

Statewide there are at least 21 fire and police stations housed in URM buildings, as are essential services for Benton, Crook, Sherman, Wasco and several other counties. In many cases, these buildings are the central landmarks of their communities.[5]

Oregon does have examples of resilient masonry buildings. In Portland, an 1875 Federal courthouse was upgraded using the most modern techniques to survive a major quake. In Pendleton, new elevators provide access to long-vacant upper floors along Main Street. And in Salem, new commercial uses are funding the upkeep of historic facades. But for every example of success, there are countless examples of significant historic URMs that remain at risk.

This report outlines eight policy recommendations to address this very pressing issue. Action is required so we don't wake up one morning in the not-too-distant future to find that some of the best of Oregon has been lost.

Executive Summary

The Main Street hardware store next to the microbrew-pub, the neighborhood grade school that's seen four generations pass through its halls, the clinker brick apartment building you moved into after graduation, the polished stone courthouse with the monument honoring local war heroes…. From Klamath Falls to Astoria, Jacksonville to Portland, these historic buildings are icons that define hundreds of Oregon's communities. Most of them are built of unreinforced brick or stone that was meant to last, withstanding fire and flood, but are at serious risk of collapse in an earthquake. Many have vacant upper floors and desperately need rehabilitation, but have real economic potential.

While no complete inventory of masonry buildings has been conducted, there are estimated to be between 5,000 and 10,000 unreinforced masonry buildings (URMs) in Oregon, with 1,765 in Portland alone. Many of these structures have achieved true cultural significance over time and have been listed on or are eligible for the National Register of Historic Places. It is those approximately 2,000 historic masonry buildings we address here.[6] They come with special challenges:

- Fire/life safety codes and ADA access requirements make utilization of upper stories challenging, limiting their income potential.
- Construction financing for URMs is getting scarce, making it more difficult to invest in rehabilitation.
- The looming threat of a major earthquake in the western half of the state creates an urgency for seismic upgrades to protect lives, community character, and economic livelihoods.

For all their issues, these historic buildings are a very important component of Oregon's economy, environment, culture, and sense of community. And there are simply too many of them for wholesale replacement to be a viable option. Our goal must be to create *resilient* masonry buildings.

The 1906 San Francisco earthquake is well-known as one of America's greatest natural disasters. While the 7.9 magnitude quake and subsequent fire destroyed an estimated 3,168 brick buildings, Oregon's risk of a 9.0 earthquake presents a similarly serious challenge for communities west of the Cascades.

Charting a Path to Resiliency

A building is resilient when it reflects four key characteristics:

- **Safety.** In parts of the state vulnerable to seismic events, the *resilient* building will survive an earthquake with no loss of life.
- **Durability.** The *resilient* building remains standing and is repairable after a disaster, with its historic elements intact.
- **Productivity.** The *resilient* building is well utilized, occupied, and accessible to the highest level possible.
- **Economic Viability.** While incentive dollars may be necessary for an initial upgrade, the *resilient* building should generate sufficient cash flow to support ongoing operations and maintenance.

While examples of safe, durable, productive, and viable masonry buildings can be found across Oregon, the state is woefully behind in fostering a resilient masonry building stock. The technology exists to upgrade historic buildings with minimal impact on character-defining features; what is needed are thoughtful solutions to promote the preservation of these historic assets for generations to come. The Historic Preservation League of Oregon believes the following eight recommendations will get us there.

1. Educate Building Owners and Contractors on Best Practices for Historic Masonry Buildings.

Preservation Roundtable workshops revealed that whether a historic building has been in the same family for generations or was just acquired by a developer, owners typically don't understand their structural composition or requirements. The same can be said for many contractors. To remedy that, an **Oregon Masonry Building Handbook** outlining best practices in masonry treatment is needed so that typical material and condition issues can be better understood and addressed by owners and contractors. Furthermore, **training courses** on basic masonry treatment and seismic upgrade techniques should be offered around the state to raise the caliber of work being done to masonry buildings.

2. Inventory Unreinforced Masonry Buildings so Communities Know What They Have. Building departments and planning offices should work together to **survey and document** masonry buildings within their communities. Using this information, local jurisdictions should identify ways to encourage and finance basic **structural assessments** for masonry buildings. And every community should prepare actionable **mitigation plans** for post-disaster protection of repairable historic buildings to avoid unnecessary bulldozing.

3. Boost Public Demand for Seismic Upgrades by Rewarding Resilience. The public has no visible way of knowing if a building has been seismically upgraded, yet many would choose a safer building if given the option. Similar to a LEED (Leadership in Energy and Environmental Design) sustainability ranking, a standardized system should be developed to recognize those buildings that will fare well in an earthquake. **Voluntary plaques** affixed to the exterior of upgraded masonry buildings would provide a simple way for buyers, renters, and occupants to understand the relative safety of their building. This would lead to increased demand and payback for seismic upgrades.

4. Leverage Existing Federal Programs to Foster Upgrades. While much can be done at the state and local levels to revitalize our historic masonry buildings, the federal government has a responsibility to assist our efforts. The **Rehabilitation Tax Credit must be modernized** to allow smaller projects and "mom and pop" building owners to access this valuable incentive. Additionally, the Federal Emergency Management Agency (FEMA) should recognize the unique earthquake risk facing Western Oregon by increasing **pre-disaster funding** for basic seismic upgrades.

5. Adopt Meaningful State Rehabilitation Incentives. Oregon's existing incentive programs are not adequate to induce building owners and developers to voluntarily rehab historic masonry buildings. **A new or improved state incentive**, coupled with local funding sources, is a must for saving lives, protecting our heritage, and better leveraging preservation as a jobs engine.

6. Increase Availability of Finance and Insurance Options. The cost and availability of mortgage financing and earthquake casualty insurance are becoming problematic for many historic building owners in Oregon. Establishing a **historic properties insurance pool** or nonprofit insurance program would help secure public and private investments in historic masonry buildings and encourage lenders to provide rate reductions for upgraded buildings.

7. Institute Changes to the State Building Code. Building codes are intended to foster public health and safety, though the application of these codes can be confusing and subject to interpretation. Property owners and their rehab team require clear, positive direction towards a path of compliance. The State of Oregon Building Codes Division should adopt **new code language that systemizes triggers and methods for seismic upgrades**, including allowing multi-year **phased improvements**. Stipulating that a percentage of dollars for substantial rehabilitation be devoted towards incremental seismic upgrades will spur work towards the eventual goal of full upgrade.

8. Government Agencies Must Take Care of Their Own URMs. Government agencies across Oregon own a lot of historic buildings. From schools to courthouses, city halls to fire stations, Oregon taxpayers paid for these buildings and they should be safe and well maintained. **Preservation plans** for all public masonry buildings should be prepared by 2020. The legislature should support these plans with special funding strategies and set a timeframe for upgrades. When historic buildings must be divested, preservation easements should be put in place to ensure these resources continue to stand and serve their communities.

Details on these recommendations can be found beginning on page 10.

Background & Definition of Terms

Unreinforced masonry buildings were built in Oregon for almost a hundred years, from the 1840s through the 1930s. Although masonry technology dates back thousands of years, the building type as built in Oregon was largely constructed of brick, stone, clay tile, and concrete block walls. Internal wood posts and beams are present in many larger URMs, but the bearing walls lack concrete or steel supports. While many of the state's masonry buildings can be readily identified from the exterior, stucco, wood, and other cladding occasionally obscure structural masonry walls.

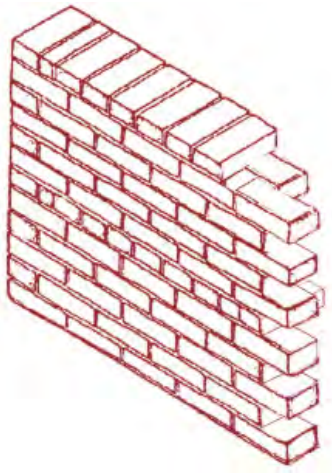
URM construction began to fall out of favor as reinforced concrete and steel buildings systems became available for larger building projects that exceeded the capabilities of unreinforced masonry construction. After the 1930s, unreinforced masonry construction became nearly extinct in Oregon, replaced by reinforced structural systems (and non-structural veneers of brick or stone). Today about 5,000 URM buildings stand in Oregon, many underutilized and vulnerable to a seismic event. It's a sad condition for such a valuable resource.

The 1846 St. Paul Catholic Church in Marion County is the oldest known masonry building in Oregon, being constructed of bricks fired on site.

ADA. *Americans with Disabilities Act*. Minimum guidelines outlining accessibility requirements for buildings.

ASCE 31. A widely accepted process for evaluating the seismic safety of existing buildings set by the American Society of Civil Engineers. ASCE 41 addresses standards for seismic retrofitting.

Bond. The orientation of bricks within an masonry wall. A common bond pattern (where a course of bricks is set sideways every 4-7 rows) is a telltale sign of unreinforced masonry construction (as illustrated here.)



Building Code. For existing buildings, the state follows the Oregon Structural Specialty Code (OSSC) and International Existing Building Code (IEBC).

Cascadia. A subduction zone off the coast of Oregon known to cause very large megathrust earthquakes and tsunamis.

CLG. *Certified Local Government.* Communities that have voluntarily accepted a set of rights and responsibilities to protect their historic properties.

DOGAMI. *Department of Geology and Mineral Industries.* State agency tasked with researching and conveying earthquake and other geologic hazard risks.

Historic—In this report, *historic* refers to places that are listed in or eligible for the National Register of Historic Places.

Magnitude. Relative measurement of energy contained in an earthquake. Geologists use the Moment Magnitude Scale, a logarithmic scale of 1 to 10 where there is a 10 fold increase in energy released at each full point on the scale.

Main Street Program. A popular four-point approach to revitalizing commercial districts administered by the SHPO.

Masonry. General term applied to buildings supported by hand-placed units of brick, stone, clay tile, and concrete block walls lacking reinforcement.

Mortar. Material used to bind individual masonry units together.

PML. *Probable Maximum Loss*. Phrase used in insurance and real estate to convey the loss that could result from a disaster.

Secretary Standards. *Secretary of the Interior's Standards for the Treatment of Historic Properties*. Best practices for rehabilitating a historic building.

SHPO. *State Historic Preservation Office*. State department that manages and administers government preservation programs.

URM. *Unreinforced Masonry*. Brick, stone, or other masonry construction lacking structural reinforcement.

The Seismic Imperative

Unreinforced masonry buildings, if maintained properly, are one of humanities' most long lasting and enduring building types. Its biggest threat is the force that wants to move it in a direction it was not designed to resist: sideways. The two forces that generally impose lateral force on buildings are wind and earthquake. While windstorms like 1962's Columbus Day Storm have caused minor damage to masonry buildings, by far the biggest concern is earthquakes. And, unfortunately, much of Western Oregon resides within one of North America's most seismically active zones. While we cannot predict exactly when an earthquake will occur, we know they are coming. It is imperative to prepare our URM building stock for a threat that was unanticipated by the original builders.

1993 Klamath Falls Earthquake

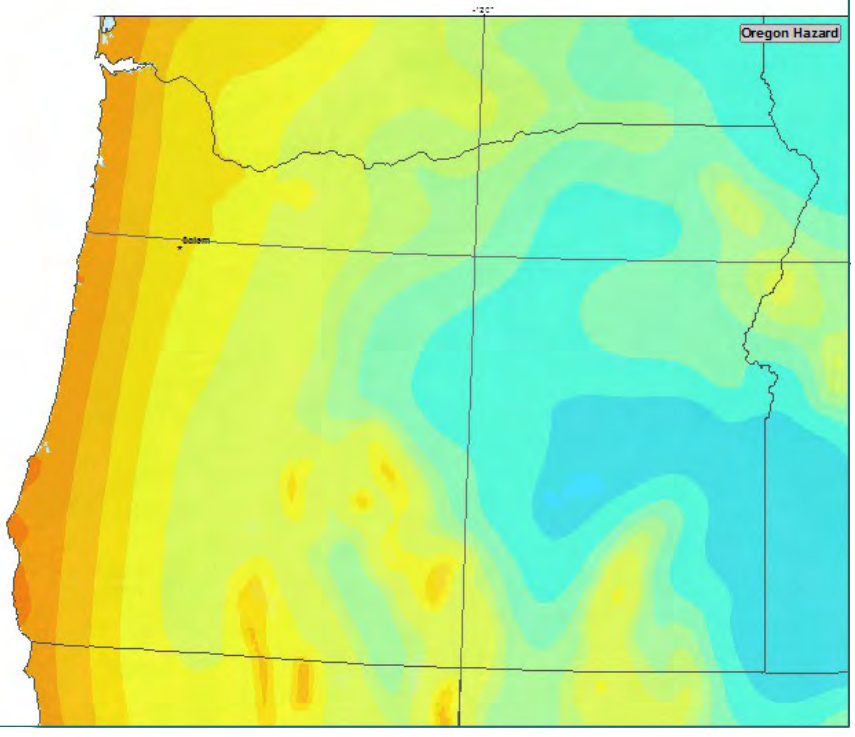
The USGS has documented sizable earthquakes occurring across much of the state since the late 1890s. Damage-causing earthquakes occurred in Portland in 1892, Milton-Freewater in 1936, and near Adel in 1968. However, two more-recent quakes are worth noting here: the 1993 Klamath Falls earthquake and the Scotts Mills Quake of the same year. The Klamath Falls earthquake damaged over 1,000 homes and commercial buildings, including the 1918 County Courthouse which was replaced following the quake. The Scotts Mills (AKA Spring Break quake) caused $28 million in damage including such significant damage to the masonry Molalla High School that the historic building needed to be demolished.[7]

While magnitude 5 and 6 crustal earthquakes such as these can be expected in many parts of the state and are a safety concern for all masonry buildings, the entirety of Western Oregon faces an even bigger inevitability: **the Cascadia Subduction Zone**.

The Cascadia Subduction Zone is a fault off the coast of Oregon that has been documented to cause significant earthquakes in the arena of 8 to 9 in magnitude. While researchers were relatively unfamiliar with the dangers posed by the fault until the early 1990s, today Cascadia has become one of the most documented seismic zones on the planet. Research has determined that the last of these large quakes occurred on January 26, 1700, far before any masonry buildings were built in the state. The ground motion from such a quake will extend as far east as the Cascade Mountains and will impact the length of the state, though Southern Oregon is prone to more frequent ruptures. According to a recent report, Oregon faces almost a 40% chance in the next 50 years of a subduction zone quake off of the coast.[8]

Of all the dominant building types in Oregon, URMs are generally the most at-risk of collapse during an earthquake.

> *Over the past 10,000 years, there have been 19 earthquakes that extended along most of the [fault], stretching from southern Vancouver Island to the Oregon-California border. These would typically be of a magnitude from about 8.7 to 9.2 – really huge earthquakes."*
>
> - Prof. Chris Goldfinger, Oregon State University



The Oregon Seismic Hazard Map *at right indicates expected ground motion during an earthquake. Orange indicates the highest hazard; blue the lowest. Courtesy USGS.*

Building Codes and Levels of Seismic Upgrade

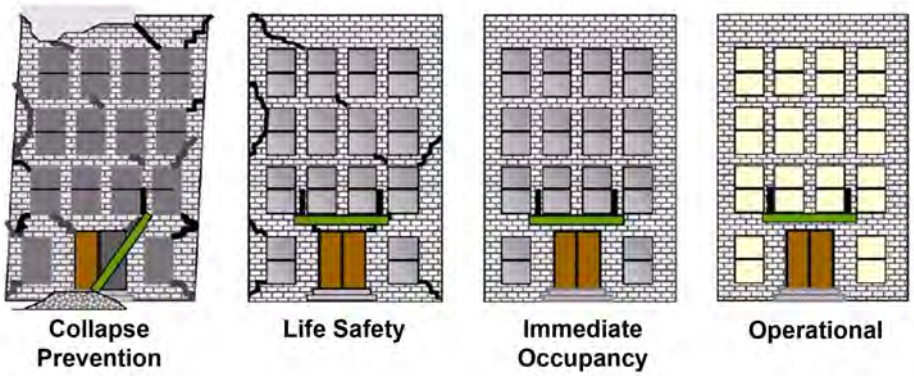
Time and again we hear from building owners that they are overwhelmed by the complexity and expense of upgrading their buildings to comply with fire/life safety codes, ADA accessibility requirements, and seismic upgrades. The result is that nothing is done to a historic building for fear of "triggering" a expensive upgrade. We will not delve into fire/life safety or ADA compliance in this report other than to summarize that they boil down to the need to add means of access and egress to upper stories, sprinkler systems, wheelchair ramps, elevators, wider doors and hallways, and restroom modifications. Typically the addition of an elevator and seismic upgrades prove to be the most difficult in older buildings due to cost or lack of space for them.

Exterior elevator on the Oregon State University campus provides ADA access and additional egress to a historic building.

Building codes are minimum standards intended to protect health and safety. They are adopted at the state level, but administered at the local level. Building codes differ from municipal codes, which set forth local issues like zoning, aesthetics, and protection of historic places. In Oregon, owners of historic buildings have the option of choosing between two sets of building codes: the Oregon Structural Specialty Code (OSSC), or the International Existing Building Code (IEBC). While both codes stipulate minimum standards for repairs, alterations, and additions to existing buildings, they do not mandate that existing buildings be upgraded unless there is a change of use. They do require that any new work meet existing code. As demonstrated in the case study on page 16, local communities may adopt additional triggers that mandate upgrade. Examples include rehab construction dollars spent or the replacement of structural elements such as a new roof.

Meeting the minimum code helps ensure that people in a building are safe, but does not ensure that the building itself is preserved following a disaster. Higher levels are required by code for buildings considered essential for public safety—such as hospitals and fire stations—where buildings must remain standing and usable.

The American Society of Civil Engineers' Standard Number 41 presents four levels of seismic upgrade options for existing buildings.



Current building code addresses collapse prevention, but does not ensure the building or the businesses and residences inside it can be saved. Illustration courtesy American Society of Civil Engineers.

- **Collapse Prevention**—Occupants may be able to exit, but building is near collapse
- **Life Safety**—Occupants are able to exit, but building has considerable damage
- **Immediate Occupancy**—Building is safe to occupy, but minor damage is present
- **Operational**—Building suffers very little damage and can be used for its essential functions

While very few masonry buildings warrant the expenditure required to achieve Operational status, there is technology for a range of seismic upgrades that will not harm the character-defining features of historic buildings. Simple solutions such as stabilizing parapets, tying-in the roof and floor joists to exterior walls, and joining exterior walls to the foundation provide significant advancement towards Collapse Prevention.

Achieving a Life Safety standard while protecting historic character-defining features should be a goal of all historic buildings. For the most significant buildings and districts, higher level upgrades should be pursued to ensure these important landmarks are passed forward to future generations.

Obstacles to Achieving Resilience

A common scenario for a historic URM involves vacant upper stories due to lack of code compliance and ADA access, resulting in insufficient cash flow for maintenance or upgrades, which can lead to "demolition-by-neglect." When participants at the 2012 Preservation Roundtable workshops were asked to identify the biggest challenges to revitalizing masonry buildings, four themes emerged: knowledge, economics, regulations, and expertise.

Property owners and community leaders don't have sufficient knowledge to address the issues.

- People are overwhelmed by seismic issues and avoid understanding or addressing them.
- Many property owners assume there's only one level of building rehabilitation: the complex and unaffordable kind.
- There exists a need to better understand the volume and value of each community's masonry buildings stock.
- Often absentee owners are not invested in the community.

The economics of rehabilitation when coupled with seismic upgrades don't pencil out.

- Complete rehabilitation of buildings including fire/life safety, ADA, and seismic retrofit is often prohibitively expensive.
- Smaller footprints typical in historic buildings make it hard to fit in upgrades and still have enough rentable space.
- Current financial incentives are insufficient for private owners and public funding is not available for governmental owners.
- Merely assessing the condition of a building and developing a plan for rehabilitation is expensive.
- Earthquake insurance is becoming more expensive and harder to get.

Codes and regulations are overwhelming, inconsistent, and not digestible to the general public.

- Current standards primarily focus on saving *lives*, not saving *buildings* and their vital functions within the community.
- There exists in some jurisdictions a lack of consistency and clarity in building code enforcement resulting in higher costs, complexity, and miscommunication between owners and officials.
- The public doesn't know which buildings have been upgraded to be seismically safer.

Design and construction professionals often lack expertise in this building type.

- Only a small pool of contractors understand the complexities involved with historic masonry buildings.
- Some regulators lack training in historic structures, resulting in over-engineered remedies and unnecessary loss of historic elements.
- Small town property owners need assistance developing a roadmap for rehabilitation and upgrades.
- New technologies and approaches are continually becoming available, though many professionals don't know about them.

Recommendations on the following pages strive to address these issues and are coupled with examples to illustrate key points.

Pendleton's LaDow Block—the Challenge of Cash Flow

With its grand Italianate façade, Pendleton's LaDow Block is one of Eastern Oregon's most prominent historic landmarks. Built between 1884 and 1890 by an early female entrepreneur, this National Register-listed building is one of the oldest and most intact buildings in Umatilla County. The LaDow serves as a prime example of the challenges addressed in this report. While the ground floor has been continuously occupied since 1890, the 19 apartments on the second floor have been vacant since 1957.[9]

To comply with modern codes, new stairs and an elevator will be needed to get the 16,000 square foot upper floor back in use. Because of decades of deferred maintenance, exterior brick is failing in numerous areas and presents a safety issue for passersby on the street. There is a desire by all parties to preserve and occupy the building, but the cost and expertise needed to overcome a half-century of neglect exceed the capacity of the owner and the available urban renewal dollars. Luckily, the successes of nearby businesses, like the Prodigal Son Brewpub across the street, demonstrate that economic viability can be achieved in Pendleton's historic buildings if the right plan and financial incentives are in place.

Findings and Recommendations

While Oregon is fortunate to have an abundant and diverse stock of historic masonry buildings, a great many of them are underutilized, suffer from decades of deferred maintenance, and at risk of collapse in an earthquake. To owners of URMs and the communities in which they stand as cultural icons, the complex challenge of upgrading them can be daunting. The HPLO believes these buildings are important to our state and they need to be made resilient – safe, durable, productive, and economically viable. The following recommendations will get us there.

1. Educate Building Owners & Contractors

There exists a pressing need in Oregon's smaller communities for building owners and contractors to have greater access to educational resources concerning historic masonry buildings. While the National Park Service and other organizations have prepared general guidelines and best practices, accessible and place-specific solutions are needed here in Oregon. As the HPLO clearly heard at the Jacksonville and Pendleton Roundtables, local contractors need training and familiarity with masonry treatment. Oftentimes owners are unaware of how to address minor condition issues and, without ready access to good literature, have a tendency to let critical deficiencies go unaddressed.

Furthermore, owners are overwhelmed by seismic upgrades and think there is only one kind–the kind they can't afford. Simple and understandable workshops that spell out the options and cost-effective solutions are much needed in the state's seismically active regions. While not all owners have the means or desire to implement the higher upgrade levels, educating owners on relatively simple solutions such as parapet stabilization, chimney buttressing, and floor tie-downs can go a long way to boost public safety.

***The bottom line*:** An **Oregon Masonry Building Handbook** is needed to educate owners and contractors on typical materials and condition issues. The Handbook should be available online and presented to local landmarks commissioners and preservation planners. A parallel training program addressing seismic options should be offered in earthquake-prone communities.

***How we get there*:** SHPO should work with the University of Oregon and Clatsop Community College historic preservation programs to compile an illustrative handbook outlining condition and treatment options for the range of masonry materials across the state. They could partner with DOGAMI and the Structural Engineers Association of Oregon to develop an educational workshop on seismic upgrades. Certified Local Governments could allocate a portion of their grant dollars to sponsor this workshop in their communities.

An Owner's Manual for Cottage Grove's Historic Masonry Buildings

In the spring of 2012, students from the University of Oregon Historic Preservation Program descended upon the Lane County community of Cottage Grove to get a crash course in masonry treatment. With support from nationally recognized masonry expert Lauren Allsopp, PhD., the team of graduate students prepared a 100-page handbook addressing construction history and condition issues typical in this community.

According to City Planner Amanda Ferguson, "There is a clear need for focused education on building maintenance and masonry repair in Cottage Grove. Property owners need help determining the best techniques to preserve their buildings and how to find good contractors to work with. The **Masonry Handbook** is a great start to providing this type of assistance."

The final version of the Handbook will be available in print and online in late 2012. The Handbook will serve as a starting point for other local communities that want to prepare place-specific guides for addressing masonry treatment issues.

2. Inventory URMs and Encourage Building Assessments

You can't develop a plan when you don't know what you have. There is no comprehensive database of Oregon's older and historic masonry buildings. While fragmented data exists in historic resource inventories and National Register nominations, and a few communities (such as Portland and Medford) have done windshield surveys of masonry buildings, local communities and the state need to do a better job documenting what we have. The state should require local communities to inventory masonry buildings.

This isn't unheard of. A 1986 California law required local governments in active seismic zones to inventory unreinforced masonry buildings and present progress reports to the state. Oregon should follow this lead.

Using this baseline data, communities in active seismic zones should encourage and sponsor ASCE 31 structural evaluations for public and private masonry buildings. While every community has different political and financial resources, finding avenues to cost-effectively help owners understand their building needs and potential seismic risks will lead to better planning and eventual rehabilitation.

Finally, every community should prepare mitigation plans for how designated historic buildings are treated following a disaster. When inspectors sweep through a region to tag buildings they deem "too far gone," they'll be able to identify buildings of historic importance to give them additional consideration and avoid wholesale demolition.

The bottom line: Every unreinforced masonry building in Oregon should be identified and documented in an accessible database, wholesale ASCE 31 evaluations should be a goal for seismically vulnerable communities, and every community should have action-oriented mitigation plans to protect historic buildings following a disaster.

How we get there: State and local agencies should work together to prepare templates for URM databases and mitigation plans that could be used at the local level. Local planning and building departments, Main Street Programs, and/or Urban Renewal Agencies should work closely with policy-makers to identify mechanisms to encourage, fund, or require ASCE 31 Tier 1 or Tier 2 evaluations of identified URMs. While these evaluations typically run $2,000 to $10,000 per property, cost savings could be achieved by evaluating a district or group of properties at one time.

Portland Public Schools Commission Historic Structural Assessment

In 2009, Portland Public Schools (PPS) commissioned an intensive study of 12 representative facilities to determine the cost and scope of work necessary to seismically upgrade the district's portfolio of schools. Of the 12 schools studied, two were URM and five were minimally reinforced masonry. The study was based on two widely-accepted documents by the American Society of Civic Engineers that could readily serve as baselines for other community studies:

- ASCE 31, *Seismic Evaluation of Existing Buildings*
- ASCE 41, *Seismic Rehabilitation of Existing Buildings*

Ainsworth Elementary School, Portland

In parallel with the seismic study, the district conducted a Historic Building Assessment, which included eligibility for National Register and a list of character-defining historic features for each school as a tool to plan for rehab and renovation.

According to the study, seismic work for the district's masonry schools would run between $35 and $66 dollars per square foot. With this information, the school board has the data to seek voter support of a bond measure to finance the upgrades and rehabilitation.[10]

3. Boost Public Demand with a Seismic Rating System

Oregonians don't know which masonry buildings have been retrofitted and which ones are still in need of upgrades. When renting an apartment, signing a lease for commercial space, or picking a favorite coffeehouse, there currently is no system for weighing the safety of the building you might be occupying. A mechanism needs to be developed to give the marketplace the information it deserves, educating non-engineers and incentivizing owners to invest dollars into seismic upgrades when they are needed. Oregon needs an understandable and **visible ranking system** for buildings that will fare well during an earthquake, perhaps a plaque with two, three, or four stars indicating the level of seismic upgrade.

The idea isn't so different from the Leadership in Energy and Environmental Design (LEED) ranking system that was developed in 1998 to recognize different benchmarks of green building. Without this type of information being available, the commercial market and public at large have no idea how their apartment, office, or school will perform during an earthquake.

Seismic upgrades can comprise a significant cost for adaptive reuse projects. We've seen these upgrades run more than $35/sf or 25% of the rehab budget. The challenge is that your typical commercial tenant does not have 'seismic upgrade' on their list when out shopping for office or retail space. As a developer, this makes it difficult to charge a premium for your upgraded building and get a return on your investment. With increased public awareness of the benefits of seismically upgraded buildings would likely come greater demand from the market.

– Jessica Engeman, Venerable Properties

The bottom line: A voluntary, yet standardized, ranking system for seismically upgraded buildings based on measurable performance standards should be implemented. Recognizable plaques placed on the exterior of qualifying buildings would boost public awareness, activate market demand, and generate better pay-back for investments in retrofitting.

Steps to get us there: The engineering community, in collaboration with the Structural Engineers Association of Oregon and State Building Codes Division, should assemble a ranking and certification system for buildings that will perform well in an earthquake. A new or subsidiary nonprofit should be tasked with certifying qualifying projects and managing the success of the system for encouraging upgrades.

Hypothetical example of a seismic rating plaque.

California Develops Seismic Rating Similar to LEED Certification

Northern California is working to recognize building-by-building seismic safety. The Structural Engineers Association of Northern California has drafted a five star system for spotlighting seismic safety dubbed the Earthquake Performance Rating System (EPRS). The five stars are allocated in three categories: safety, repair cost, and time to regain function. To be rated 4 or 5 stars, a building must not only demonstrate structural safety, but also show that non-structural elements would be secure during an earthquake. According to a 2011 report, "The audience for the rating system includes anyone who makes decisions about buildings, regardless of their engineering expertise. This includes occupants, buyers, sellers, and tenants of a building, as well as insurers and lenders."[11]

While the proposed system doesn't profess to assign a precise gradation to the five stars, it is intended to convey technical values to the public at large. Using ASCE 31 standards as a basis for the rankings, the EPRS is intended to be a standardized, yet voluntary, system managed by a non-profit similar to the US Green Building Council's administration of LEED.

4. Leverage Federal Programs for Upgrades

There are two ways the Federal government can make a smart investment in the resiliency of historic buildings: by expanding the Federal Rehabilitation Tax Credit so it applies to smaller scale projects typical along Main Streets, and by proactively allocating Federal Emergency Management Agency (FEMA) funds for upgrades *before* disaster strikes.

The numbers prove that preservation incentives work! Across the U.S. from 1978–2011, **Rehabilitation Tax Credit** projects totaled $116.5 billion, generated 2,216,000 jobs, and over 42,000 historic buildings were rehabbed. Those projects received $19.2 billion in Federal tax credits, but generated $24.4 billion in new Federal tax receipts: a 27% return on the government's investment. An estimated $9.1 billion in state and local tax revenues were also generated by these projects.[12]

Clearly, the program has been effective and profitable, but it generally only works for large-scale commercial projects. Why? The IRS allows two types of tax credits for older, income-producing (depreciable) properties: A 10% credit for rehabilitations on buildings constructed before 1936 but not listed on the National Register; and a 20% tax credit for properties listed on the National Register that adhere to the Secretary of the Interior's *Standards*. To qualify, the project must exceed the greater of $5,000 or the adjusted gross basis (purchase price plus improvements, minus land cost and depreciation).

Often times, small scale projects simply cannot meet this equation. The threshold needs to be lowered and Congressmen Aaron Schock (R-IL) and Earl Blumenauer (D-OR) have proposed **updates to the tax credit to better support Main Street property owners**. But broad public support is needed to move the legislation out of committee.[13]

FEMA is actively helping Western Oregon prepare and mitigate for the inevitable Cascadia Subduction Zone earthquake. FEMA's Pre-Disaster Mitigation Grant Program allows agencies and local governments to request funding for structural retrofitting of existing buildings, but funding has been decreasing in recent years. A coalition of the states in the Cascadia Subduction Zone (Oregon, Washington and California) should actively lobby for increased **FEMA funding for pre-disaster grant allocations** for upgrades, which could be matched by state and local funding.

The bottom line: Rehabilitation is an excellent investment for the government and Congress should modernize the Federal Rehabilitation Tax Credit for the benefit of smaller projects. Further, it will be less expensive for FEMA to fund seismic upgrades now through pre-disaster mitigation grants, instead of rebuilding after an earthquake.

How we get there: Changes to the Federal Rehabilitation Tax Credit require congressional approval and Oregon needs to get firmly behind Congressman Blumenauer's effort update it. Also, a coalition of Cascadia states should lobby for increased funding for FEMA Pre-Disaster Mitigation Grants.

Rehabilitation Tax Credits as Effective Incentives for Oregon

From 2001 to 2011, a total of 77 Federal Rehabilitation Tax Credit projects in Oregon generated 8,510 jobs totaling over $298 million in household income. Twenty-six of these redevelopment projects took place in smaller communities around the state from Lakeview to Astoria.[14]

In 2011 alone, historic rehabilitation projects aided by the Rehabilitation Tax Credit generated 948 jobs in Oregon, supporting over $38 million in household income. These projects generated over $3 million in taxes for Oregon's local and state coffers, plus a $9.3 million bump in federal tax revenues.[15]

Pictured here is the Post & King Building in Lakeview. Rehabilitated at a cost of $926,331, South Valley Bank accessed $185,000 in Federal Rehabilitation Tax Credits to bring this 1901 saloon back to life as a bank. It is one of only 25 tax credit projects valued at less than a million dollars that occurred in Oregon during the period 2001-2011. According to project architect Pari Pedersen, "The tax credit was crucial. There was a great deal of local pride when the project was completed."

5. Adopt Meaningful State and Local Incentives

Preservation of our historic buildings provides public benefits to our economy, culture, and environment. While the Federal government provides important incentives, many smaller commercial projects don't presently qualify for them. We need cost-effective state and local-level incentives to jumpstart this effort.

Oregon's primary financial incentive for rehabilitating historic buildings is the Special Assessment program. It freezes the assessed value of a qualified historic property for ten years in exchange for the owner's commitment to execute a rehabilitation plan that adheres to the Secretary of Interior's Standards. In decades past, Special Assessment worked pretty well. However, the property tax limitation measures of the 1990s, coupled with expectations for fire and building code compliance, weakened its impact considerably. Today very few property owners bother to apply for the program.

It's time for something better. Thirty states in the U.S. have implemented a **state rehabilitation tax credit** which, when coupled with the Federal Historic Rehabilitation Tax Credit, provides meaningful stimulus for the redevelopment of historic commercial properties.[16]

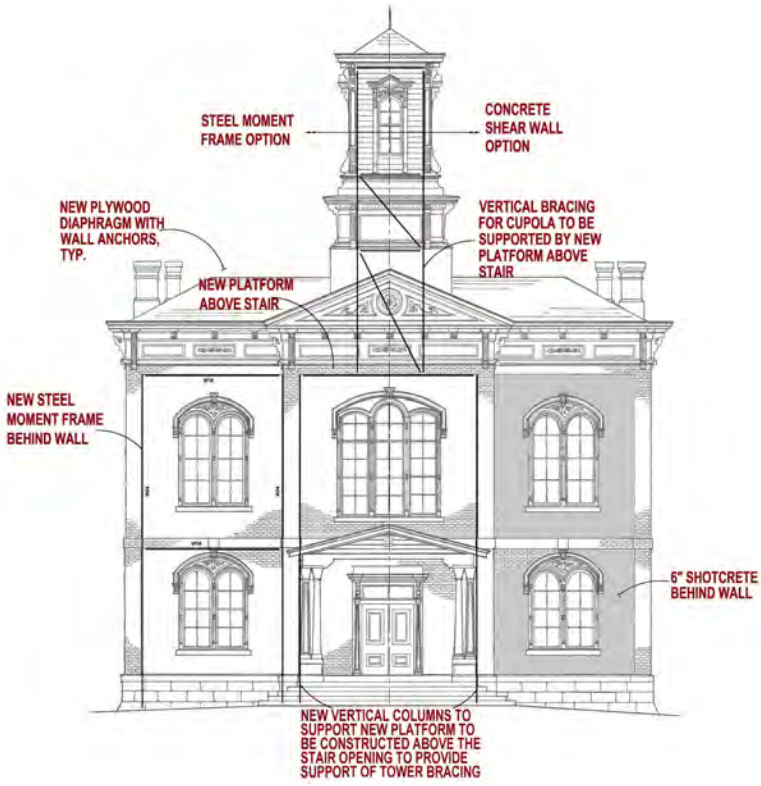
Locally, governments like Salem, Medford, and over 50 other communities have adopted **urban renewal** as a tool for improving "blighted" areas and their tax base. The urban renewal tool effectively borrows the incremental increase in tax revenue to fund improvements during the lifetime of the Urban Renewal Area designation (typically 15 years). The government's "investment" in the district is paid back with the increased tax revenues from the revitalized district. To ensure urban renewal leaves a truly lasting investment (that won't turn to rubble in areas vulnerable to a Cascadia earthquake), local governments would be wise to require that a percent of urban renewal dollars be set-aside for historic rehab.

The bottom line: While Oregon was a pioneer in incentivizing historic preservation with its Special Assessment program, today the program is largely ineffective. Owners of historic masonry buildings need better help to mitigate the up-front costs of rehab.

How we get there: Urban renewal agencies should direct an appropriate amount of funding toward historic building rehabilitations. Furthermore, the HPLO plans to bring Oregon's historic preservation community together in 2013 to identify a new-and-improved state incentive program, encouraging rehabs in every corner of Oregon while benefiting government coffers.

Jackson County Courthouse

The landmark 1884 Jackson County Courthouse is no longer in use and may eventually transfer to private ownership. So the HPLO asked KPFF Consulting Engineers to develop conceptual estimates for a seismic upgrade, which would be triggered by the change of use.



KPFF presented options for two levels of seismic upgrade. A Life Safety upgrade would cost $25-35 per square foot, for a total upgrade price of around $332,500. A higher level Immediate Occupancy upgrade would cost $31-44/sf for a total upgrade price of $415,625. (These numbers only account for seismic work, not systems or other improvements.)

One option utilizes concrete shearwalls placed against the inside face of exterior, and some interior, walls. The second option uses a steel moment frame, placed on the inside face of exterior and some interior walls. Both options would require the second floor and roof to have a new plywood diaphragm overlay and the floors anchored to the walls. Bracing and a new steel trussed tower would be required to hold up the character-defining cupola. A hybrid of the two options is shown in the elevation drawing above.

6. Increase Availability of Finance and Insurance Options

There is a trend suggesting insurance and finance options are becoming more limited and more costly for owners of historic masonry buildings here in Oregon. Although most owners are still able to access insurance and conventional financing, this California example provides a warning for what may lie ahead for Oregon's historic property owners:

Following the January 1994 Northridge Quake in Los Angeles, insurance companies paid out $15 billion in claims. It amounted to the costliest earthquake in U.S. history. Within a year of the event, 90% of insurers severely restricted and/or refused to write earthquake insurance. In 1995, the California Legislature created a state supported, but privately funded, earthquake insurance pool. Oregon shouldn't wait for a disaster to get the right support in place for insuring at-risk historic buildings.[17]

Already, many Oregon insurers have raised policy deductibles, excluded some items from coverage, and have altogether withdrawn from the earthquake insurance market. This is coupled by the fact that commercial lenders are increasingly cautious about financing for URM buildings. As evidenced by the popular Fannie Mae Delegated Underwriting and Servicing loan program, 100% full replacement cost earthquake insurance and a favorable Probable Maximum Loss (PML) risk assessment are needed to access this commonly used multifamily lending option.[18]

While subsidized or more flexible financing options should be explored, the greater need is for an insurance pool for historic properties. To support owners of historic buildings, government or a nonprofit should develop a program to ensure that public and private investments are protected by appropriate coverage.

The bottom line: A new insurance pool for historic properties that includes high-risk items like flood, landslide, and earthquake, would give lenders greater confidence while also rewarding owners who take on the responsibility of stewarding a historic property.

How we get there: In 2001 Oregon Congresswoman Darlene Hooley introduced a bill that would have incentivized private sector efforts to reduce potential earthquake losses. Although the bill was never passed, it helped get Congress thinking about the risk posed by earthquakes.[19] State and national leaders should once again pick up the torch and assemble a government or nonprofit supported insurance pool for historic properties.

Rehab of Rich Hotel for Workforce Housing Includes Voluntary Seismic Upgrade

In 2012 a turn-of-the-century URM in Portland's Skidmore/Old Town National Historic Landmark District was rehabilitated to create 34 units of workforce housing. The project's nonprofit developer, Innovative Housing Inc., sought to bring affordable market rate apartments to a neighborhood that primarily housed very low-income people. The developer's choice not to seek public subsidies and to use conventional financing made a full seismic upgrade unfeasible for their $2.6 million budget.

That said, a voluntary upgrade—including parapet bracing, roof tie-downs, and a concrete "core" in the center of the building—proved sufficient to meet the expectations of Portland's building department, the project's lender, and the building's insurer (enough so that a significant rate reduction was achieved). The developer preserved historic elements and layout, added ADA-accessible units to the ground floor, and revitalized retail spaces along the street-facing elevations.

Project Manager Julie Garver notes, "The project team was critical to making the Rich Building work. You make hard choices about where and how to spend money, and a lot of discipline is required to stay on budget."

7. Add Clarity and Flexibility to State Building Code

The *Oregon Structural Specialty Code* – the formal building code for the state – treats the upgrade of existing buildings with a rather narrow understanding and somewhat vague language. Often the path towards code compliancy is left to the local building official, resulting in inconsistencies statewide. During Roundtable workshops, property owners expressed frustration about that the lack of clarity and flexibility. Building officials as well wanted more cohesive instructions on how to properly encourage structural upgrades.

To help address these issues, Oregon recently adopted the *International Existing Building Code* as an alternative method to the base code. This was a step in the right direction, but further steps are needed to both clarify the application of code requirements and encourage building upgrades to the highest possible level of compliance.

Portland and Medford have taken their own local approaches to add clarity and flexibility to building code requirements, while at the same time expecting a higher level of seismic upgrade work. Both cities spell out thresholds of rehab spending that trigger seismic upgrades. Furthermore, both cities encourage **greater communication** between development teams and building officials to allow for more appropriate and/or **phased upgrades**. The Building Codes Division should adopt new code language that applies the best of Medford and Portland's examples to all parts of the state in active seismic areas.

Mandating seismic upgrades would be the most effective method of preparing our URMs for future earthquakes. California has done exactly this, but here in Oregon this approach is considered too aggressive for many of the state's smaller communities, and could lead to disinvestment and demolition of historic buildings whose owners could not afford to comply. A better means to increase private investment and public safety would be to pair clear direction for seismic upgrade expectations with state and local incentives, as proposed on page 14 of this report.

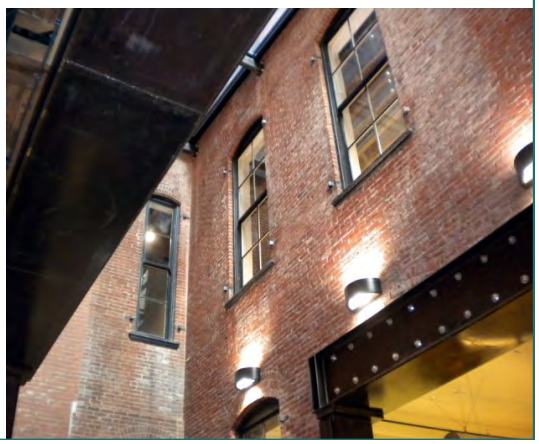
The bottom line: The building code needs to be a comprehensible tool to encourage, not dissuade, the upgrade of historic URMs. Incentives and clarity, more than mandates, will increase applicability statewide.

How we get there: The State of Oregon Building Codes Division should apply lessons from Portland and Medford and adopt systemized triggers and a process for multi-year phased upgrades in all seismically vulnerable communities. While an act of the legislature may be necessary, it is critical to get all communities on the path to upgrading their buildings through a set of reasonable and action-oriented building code expectations.

Chapter 24.85: Portland's Local Amendment Governing Seismic Rehab and Repair

With a greater understanding of earthquake risks and rehabilitation costs, in 1997 the City of Portland adopted Seismic Design Requirements for Existing Buildings, also referred to as "Chapter 24.85" in the city's building regulations. The goal was to improve the level of seismic safety in Portland's existing buildings by setting triggers for upgrades, while providing increased flexibility to owners.

The provisions of Chapter 24.85 apply when a building permit has been pulled to change the occupancy classification, add square footage, alter, or repair an existing building. It allows for ***phased seismic improvements over a 10 year period***, permitting owners to spread out costs. Chapter 24.85 also stipulates that an ASCE 31 ***seismic evaluation*** be done when alterations cost more than $175,000, so owners understand their building's structural condition.



Richard Rogers, Structural Program Chief with Oregon Building Codes Division, reports that "[Chapter 24.85] has a successful track record of balancing the diverse needs of building owners, historic preservationists, and public seismic safety policy."[20]

8. Government Agencies Must Take Care of Their Own URMs

Oregonians expect government agencies to take good care of their historic buildings: schools, courthouses, libraries, and city halls that stand as landmarks in their communities. Built with public tax dollars, they reflect civic pride in their architectural design. Unfortunately, across the state these important buildings are today in various states of repair and many are seismically vulnerable or under-functioning due to the need for systems upgrades.

City, county, and state governments needs to be better stewards of historic resources. **Preservation plans** that follow the Secretary of Interior's Standards should be commissioned for all government-owned historic properties to document the building, identify repairs and appropriate treatment of historic elements, systems upgrades, and seismic retrofitting where necessary. A reasonable timetable to accomplish this planning is by 2020.

Once plans are in place and budgets determined, local governments must pursue funding strategies to implement needed rehabilitations. In addition to drawing upon General Funds or bonds, other strategies exist. For example, Washington State offered Historic County Courthouse Rehabilitation matching grants. Another option is public-private partnerships using an IRS 63-20 financing structure. The Commodore Duchess Apartments on the University of Washington campus were rehabbed by a private developer, saving 50% of the estimated cost if the University had done the project.[21]

There will also be cases where government just no longer needs some of their historic buildings. In these cases, the sale into private ownership should be structured to preserve the building. The sale price should reflect the acknowledged cost of structural upgrades and a historic conservation easement should be put in place to ensure the building and its historic features are maintained for the public benefit. This would fulfill Section 106 requirements which stipulates that transfer of ownership out of government control poses a threat to historic resources.

The bottom line: Preservation plans should be mandated by 2020, followed by funding for rehabilitation. When historic buildings are divested into private ownership, pricing should acknowledge necessary upgrades, and conservation easements should ensure permanent protection of the most significant buildings built with public funding.

How we get there: This is a task for local policy makers and the state legislature which will need to draft the appropriate mandates and funding mechanisms.

Base Isolation Retrofit Protects Portland's Pioneer Courthouse

Few buildings in Oregon are as recognizable as Portland's Pioneer Courthouse. The oldest federal building in the Pacific Northwest, the 1875 Courthouse was designated a National Historic Landmark (the crème de la crème of historic designations) in 1977 after being saved from demolition and obsolescence in the post-war years. In the late 1990s, the General Services Administration (GSA) began investigating options to rehabilitate and upgrade the stone masonry building to ensure its permanence in downtown Portland.

Tapping $20 million in funding approved by Congress, a 19-month rehab project preserved historic features while thoroughly updating systems, courtrooms, and adding underground parking. A system of 75 base isolators was installed to effectively protect the building during an earthquake.

Completed in 2005, the rehabilitated Courthouse is now one of the safest masonry buildings in Oregon.

The Cost of Doing Nothing

In February 2011, Christchurch, New Zealand, was hit with a magnitude 6.3 earthquake. The earthquake caused widespread damage, especially to the historic masonry buildings that sprinkled the central business district. Following the earthquake, 500 historic buildings were deemed unsafe and many have since been leveled. Almost 200 people died in the earthquake and rebuilding estimates hover around $30 billion in US dollars. Its downtown district is still closed over 18 months later, and both people and businesses have moved away. Christchurch will never be the same.[22]

To put it in perspective, with a population of 367,000 Christchurch is a little over half the size of Portland. Both communities are similar in that they were founded in the 1840s, retained a large number of historic masonry buildings with no mandated upgrades, and are located along local fault lines known to cause moderate to severe earthquakes.

Imagine what a similar event could mean for the Rose City. Take for example, masonry apartment buildings. With the exception of a small handful of buildings that have received some level of seismic upgrade, there are approximately 200 masonry apartment buildings in Portland valued at over $350 million, comprising over 3.8 million square feet, and 5,200 apartment units.[23]

If Western Oregon were to suffer a Cascadia Subduction Zone earthquake in our current state of un-preparedness, there would be tragic loss of life, not to mention:

- Billions in real estate value and property tax base lost.
- Tens of thousands of people without housing.
- Schools, courthouses, police stations, and city halls closed.
- Thousands of businesses and entire business districts shut down for an indefinite period of time.
- A devastating loss of history and cultural identity. Oregon would never be the same.

We hope this Special Report gets Oregonians talking about how we regard and pass-forward our venerable masonry buildings. We know that resiliency is possible, but we also know creative thinking and firm resolve are needed to get us there.

The time to take action is NOW.

Yes, We Can Have Safety AND Preserve Our Historic Assets!

By no means must resilience come at the expense of preservation. Our historic buildings can be dynamic, adapting to changing needs while preserving historic fabric to the highest degree possible.

In Oregon, most preservation occurs at the local level. Certified Local Governments like Bend, Portland, and 39 other cities have implemented ordinances to protect designated historic properties, but many communities have no such framework in place. The Secretary of the Interior's Standards are a good starting point and the National Park Service offers these basic principles for seismic retrofits:

- Historic materials should be preserved and retained to the greatest extent possible and not replaced wholesale in the process of seismic strengthening.
- New seismic retrofit systems, whether hidden or exposed, should respect the character and integrity of the historic building and be visually compatible with it in design.
- Seismic work should be "reversible" to the greatest extent possible to allow removal for future use of improved systems and traditional repair of remaining historic materials.[24]

Acknowledgements

The 2012 Preservation Roundtable was made possible by the dedicated assistance of a six-member volunteer taskforce which helped organize workshops, conduct research, vet information, and assemble the findings and recommendations included in this report. Thank you Paul Falsetto, Walter McMonies, Natalie Perrin, Ross Plambeck, Matthew Roman, and our Taskforce chairman Jay Raskin. The Special Report was authored by Brandon Spencer-Hartle and edited by Peggy Moretti.

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Finally, thanks to all who participated online, at a workshop, and through a site visit or interview. We couldn't have arrived at these practical solutions without you!

Notes:

1. Given limited availability of data, the HPLO believes there are no fewer than 4,896 unreinforced masonry buildings in Oregon. This number was determined through information from three inventories: 2001 data from City of Portland, 2004 data from City of Medford, and 2012 data from the SHPO Historic Sites Database. Given incomplete data and a design tendency to obscure masonry construction with stucco, paneling, and other forms of cladding, the number of URMs is likely between 5,000 and 10,000.
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HISTORIC PRESERVATION LEAGUE OF OREGON

About the HPLO

The mission of the Historic Preservation League of Oregon is to ***Preserve, Reuse, and Pass Forward Oregon's Historic Resources to Ensure Livable, Sustainable Communities.*** Founded in 1977 as a 501(c)(3)non-profit, the HPLO provides education programs, advocacy, technical assistance, and stewardship of over 40 conservation easements on historic properties across the state, protecting them from demolition in perpetuity. Our programs include:

- Previous Preservation Roundtable sessions on *Healthy Historic Districts* and *Compatible Infill Design*
- Education programs on *Preservation 101*, *How to Save an Endangered Building*, and *Adaptive Reuse of Historic Schools*
- Historic home tours in Eugene and Portland
- Legislative testimony at the local, state, and national levels
- Providing technical assistance, advocacy, and preservation seed grants to save Oregon's Most Endangered Places.

The HPLO office is located in the historic White Stag Block in Portland's Skidmore Old Town National Historic Landmark District. Programming is delivered across the state.

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