

## **Big Steps Before the Big One:**

How the Portland area can bounce back after a major earthquake

A 9.0 megathrust earthquake at the Cascadia subduction zone will shake the Pacific Northwest to its foundations. Minimizing damage and maximizing community capacities to respond will speed Portland's recovery.

Your committee did not focus on the responses that will be required immediately following an earthquake. Those rescue operations are already being developed, tested and refined. Instead, your committee identified actions that will help ensure that our unique culture and strong economy can continue to thrive after a major earthquake.

This report provides findings, evidence-based conclusions, and recommendations that further two vital goals – mitigating risk to vulnerable physical systems and empowering communities.

Your committee identified five areas that are linchpins of resilience. For each, this report recommends practical, often relatively low-cost, steps to reduce damage from a Cascadia quake and shorten the time required for the region to rebound.

### **FUEL**

Liquid fuel will power both rescue and recovery. Yet, as Oregon's Resilience Officer told your committee, "Fuel is our Achilles heel." Almost 90 percent of the state's liquid fuel is funneled through fuel tanks at the Critical Energy Infrastructure (CEI) Hub, a six-mile stretch on the west bank of the Willamette River in Northwest Portland. These tanks, some of them more than 100 years old, have been built on dredged soils likely to liquefy in a quake. That would cause the tanks to tilt and rupture, triggering a massive environmental disaster and creating a fuel shortage that would hobble both short-term rescue and long-term rebuilding.

### **BUILDINGS**

In a resilient city, most people would remain in their homes and return to their workplaces after a disaster. But few Portland structures – new construction as well as old – would be functional after a Cascadia earthquake. Buildings constructed after 1994 meet current earthquake standards, but these standards only protect the lives of those inside. A higher seismic standard is necessary to ensure that newly constructed buildings will remain usable, particularly office buildings and multi-family housing.

## **LIFELINES**

A Cascadia earthquake could devastate Portland’s brittle transportation network. Roads, runways, marine terminals, rail tracks, bridges and approaches to bridges are at high risk from soil liquefaction, landslides and debris from damaged buildings. Immediately after a major quake, our rivers will become barriers to recovery. Even the Sellwood Bridge and Tilikum Crossing likely will be unusable for some time.

It is vital that at least one Willamette River bridge be operational immediately after an earthquake, ideally one on a designated lifeline route such as Burnside Street. The 2002 Burnside Bridge upgrade to life safety standards does not ensure that it will remain usable post-quake.

## **PEOPLE**

Fuel, buildings and even bridges don’t make Portland. The families and neighbors, executives and food cart operators, bikers and brewers, everyone together energize the city. They have kept Portland weird, and in so doing created a uniquely vibrant national treasure. If people abandon the city in large numbers after an earthquake, they will take with them Portland’s essence. Preparedness and resilience require that people are fully educated on the risks they face, the challenges they will likely endure following a disaster and the steps they can take to become more prepared so that they can remain in place or quickly return.

## **COORDINATED PLANNING AND INVESTMENT IN RESILIENCE**

The complexity of impacts resulting from a major earthquake is difficult to imagine. A multitude of physical, financial, business, education and social networks will be damaged. Because these systems intertwine, earthquake impacts will be compounded. Coordinated planning that links governments, community organizations and businesses to support resilience will better prepare the region to rebound from a Cascadia earthquake and other disasters.

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Sustained investment in strengthening physical and social infrastructure is essential to prepare the region for recovery from a megathrust earthquake. The time horizon your committee envisions stretches 50 years and beyond. As each area is addressed, new priorities will emerge. Improving preparedness and resilience is a continuous learning process.

Portland and Oregon must start cultivating a culture of resilience right now. An essential first step is educating our children about risks and resilience so they will be prepared to continue this vital work in their own time.

Portland-area communities are built atop tectonic forces beyond anyone’s control, but the region is not helpless. The Portland area is not yet prepared, but leaders and the public are learning what must be done to reduce damage and recover quickly from the earthquake’s impacts. This knowledge confers responsibility and opens opportunities to continue along the path to a resilient future in which our unique regional culture will not just survive but thrive.

# RECOMMENDATIONS

## Reducing risk of catastrophic CEI Hub failure

1. The Oregon Department of Geology and Mineral Industries should commission a geotechnical study of the soils in the Critical Energy Infrastructure (CEI) Hub and alternatives for soil hardening. If grant funding is unavailable, the Legislature should appropriate funds for the study.
2. The Governor and Legislature should designate a single state agency to oversee seismic risks at the CEI Hub. That agency should have the authority to:
  - Require all owners of CEI Hub facilities to provide an engineering assessment of their facilities' vulnerability to a CSZ earthquake and other information relevant to mitigating the current risks.
  - Develop and implement, in collaboration with industry stakeholders, standards for construction and retrofit of storage tanks at the CEI Hub. The standards should be designed to prevent releases and to preserve substantial functionality in the event of a CSZ earthquake.

## Improving building safety and resilience

3. Portland should seek approval from the Oregon Building Codes Division for a local amendment that requires office buildings and multifamily housing to be built to a standard that would allow them to be used and occupied after a CSZ earthquake. The BCD should grant the waiver.
4. All local governments in the Portland area should require that structures built or significantly remodeled using any public financing meet standards that will allow the buildings to be used and occupied after an earthquake.
5. Portland should adopt the mandatory unreinforced masonry (URM) retrofit policy now under consideration and should continue to lead a multi-stakeholder collaborative process to develop a range of incentives to assist property owners in retrofitting.
6. The Legislature should allow cities and counties to grant property tax exemptions to offset retrofitting costs.
7. Portland and other local governments should inventory non-URM building stock at high risk in a CSZ earthquake, such as non-ductile concrete and soft story structures.
8. The Legislature should require a seismic resilience disclosure statement at the point of sale for single-family homes.

## Reinforcing transportation lifelines

9. Multnomah County should begin upgrading or replacing the Burnside Bridge within three years. Voters, public officials and the Legislature should support local and state funding measures to make this timetable feasible.

## Enhancing social resilience

10. School districts in the Portland metro area should provide students and their parents with comprehensive information about earthquake risks and preparedness strategies.
11. Portland should allocate funds to enable the Portland Bureau of Emergency Management to hire a second Neighborhood Emergency Team coordinator who will increase the number, diversity and retention of trained NET volunteers.
12. Metro-area governments that contract with nonprofit service providers should use the contracting process and periodic audits to require them to have continuity of operations plans.

## Coordinating and expanding resilience planning

13. Portland and other local governments should appoint a resilience officer or designate an existing high-level position to be responsible for resilience efforts, including:
  - Linking together the many agencies, planning bodies and governance structures engaged in planning and preparing for major earthquakes and other challenges the jurisdiction is likely to face,
  - Coordinating and expanding public outreach and awareness efforts focused on earthquake preparedness,
  - Cultivating public-private partnerships that support resilience enhancement, and
  - Working with the Regional Disaster Preparedness Organization to support coordinated planning for resilience across the region.
14. Government and private sector members of the Regional Disaster Preparedness Organization should increase their funding commitment to a level sufficient to support two full-time professional staff in addition to the administrator.

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## ABOUT CITY CLUB OF PORTLAND

City Club's mission is to inform its members and the community in public matters and to arouse in them a realization of the obligations of citizenship. We bring together civic-minded people to make Portland and Oregon better places to live, work and explore.

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