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Quake early warning system gets \$3.6 million, but it's still a long way from goal



Wreckage from the 5 and 14 freeways after the Northridge earthquake of 1994. (Jonathan Alcorn / Los Angeles Times)

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With officials still struggling to find money to create an earthquake early warning system for the West Coast, a private foundation, Intel Corp. and an arm of Amazon.com Inc. said they will pitch in money or other support, officials said at a White House summit Tuesday.

But there's still not enough funding to build out the \$38-million system that could provide seconds or minutes of warning before the worst shaking from an earthquake arrives. Despite an infusion of \$8 million from Congress and President Obama in the current budget, there is still a long way to go before full funding can be provided to get the system operational in as little as two years.

“While this federal investment is hugely important, we also need to look at state and private sources of funding to build out the system of sensors,” said Rep. Adam Schiff (D-Burbank). “The cost of the system pales in comparison to the fact that we can save lives with the system.”

In an interview, Schiff pointedly needled the state of California for declining to back the system with money. Across the West Coast, the system has about 650 stations contributing to the early warning system, but there needs to be hundreds more.

“We really need the state of California to embrace this financially,” Schiff said. “This is not something that the federal government is in a position to build out or operate on its own,” he said.

H.D. Palmer, deputy director for Gov. Jerry Brown’s Department of Finance, said Tuesday that the state’s policy is to not use money from the general fund for the early warning system. The Governor’s Office of Emergency Services is continuing to search for other sources of funding.

The U.S. Geological Survey, which has been working on an initial prototype for years, this week unveiled a more robust, operational version that is far faster and more reliable.

The more stable system will allow the USGS and other entities to test other ways the data can be used. One idea already in place is the automatic slowing of San Francisco [Bay Area Rapid Transit](#) trains before seismic shaking arrives.

Even just one packed 10-car train, with about 150 people per car, derailling at high speed from shaking would be a disaster — during rush hour, as many as 40 BART trains out of 64 on the system are traveling as fast as 70 mph, a BART official said.

The USGS can now explore approving ideas such as automatically opening fire station garage doors before they get jammed from the shaking, and triggering a backup generator and notifying emergency personnel at the Los Angeles County Metropolitan Transportation Authority.

More advanced solutions are already in place in Japan, which for years has had a robust warning system that sends alerts through TVs, computers and cellphones. When the magnitude-9 earthquake hit east of Japan in 2011, many people in Tokyo, 200 miles away from the epicenter, had 30 seconds of warning that the shaking was coming.

In Japan, one factory has figured out a way to secure noxious chemicals between the time of a quake warning and the actual shaking.

Although there are enough sensors to provide good warning for Los Angeles and San Francisco, there are gaps in the network in sparsely populated areas of California, as well as in Oregon and Washington. “The station density is not sufficient to support timely alerts,” said Doug Given, USGS earthquake early warning coordinator.

For instance, a limited number of stations in Cape Mendocino could provide less warning if an

earthquake on the massive San Andreas fault began barreling south toward the Bay Area, Given said.

On Tuesday, backers of the system welcomed announcements of private foundation grant money and statements of support from tech companies at the summit hosted by the White House's Office of Science and Technology Policy.

The Palo Alto-based Gordon and Betty Moore Foundation said it would contribute \$3.6 million in new money to UC Berkeley, Caltech and the University of Washington. The foundation has now donated about \$10 million to the effort since 2011.

The researchers will explore using sensors common in smartphones to detect earthquakes for the warning system, develop a computerized decision-making process to issue fast, reliable alerts, and study how to install sensors on the Pacific Ocean floor to provide faster warnings for earthquakes from the Cascadia subduction zone.

The subduction zone, west of California's North Coast, Oregon and Washington state, is capable of producing a magnitude-9 earthquake and tsunami that could wash away coastal towns, destroy U.S. Highway 101, and obliterate 100 bridges and kill as many as 10,000 people.

Amazon Catalyst, an arm of Seattle-based Amazon.com Inc., said it is funding the University of Washington to create MegaShake, a new system that will combine GPS and seismic data to accurately identify incoming earthquakes above magnitude 7. The amount of the grant was not disclosed. A nonprofit in Washington, the Puget Sound Energy Foundation, announced a \$100,000 grant to buy eight seismic sensors.

Intel, based in Santa Clara, Calif. and the largest private-sector employer in Oregon, said it will lead an effort to encourage businesses to play a role in building and maintaining the early warning system, known as ShakeAlert. Early notice could allow workers to drop, cover and hold, halt elevators, and stop sensitive manufacturing processes before shaking arrives, potentially saving millions of dollars in downtime.

U.S. Secretary of the Interior [Sally Jewell](#) said it is important that the warning system eventually expands beyond California, Oregon and Washington to other states across the country. States such as Alaska and Nevada are logical next steps, she said, but other states would also benefit.

The earthquake hazard is real in other areas of the country. Magnitude 7 earthquakes shook up Tennessee, Kentucky, Missouri and Arkansas in 1811 and 1812. About 60 people died in South Carolina in 1886 when a magnitude-7.3 earthquake hit Charleston. And an earthquake in the Boston area in 1755 brought down chimneys and roofs, and was felt as far away as Maryland and Nova Scotia.

And in 2011, a 5.8 earthquake that struck Virginia and damaged the Washington Monument caught people by surprise because they didn't expect an earthquake in the region.

"It could happen anywhere," Jewell said. "People were shocked. And it certainly was scary for the people in the Washington Monument," where the elevator failed and mortar tumbled on to the ground below; the repair took three years to complete.

Unlike the federal government, state governments in California, Oregon and Washington have not allocated money for the system as part of their regular budgets.

"Japan is ahead of us, China is ahead of us, Turkey is ahead of us, Mexico is ahead of us. There is no reason we can't do this," Jewell said.

Schiff welcomed the White House's interest in the early warning system, saying: "It shows a whole new level of engagement by the White House in this initiative."

John Vidale, director of the Pacific Northwest Seismic Network, said it's good that the warning system has half of its \$16 million annual operating cost from the federal budget, but more funding is needed to make the system reliable for public use.

"We have it operating now, basically, but we can see that it's slow and it's inaccurate, and it sometimes gives out false alarms. It's really a matter of getting the right equipment in place and testing it all before we can let it loose on the public," Vidale said.

Also Tuesday, President Obama issued an executive order calling for new federal buildings to be constructed to the most current earthquake-resistant design. Officials were also instructed to ensure that new leases of federal buildings were built to the latest seismic codes.

"Stronger seismic standards for federal buildings will help protect public safety," Sen. Dianne Feinstein (D-Calif.), who has called for improving seismic safety of federal buildings, said in a statement. "It's encouraging that the administration will ensure that federal facilities are taking simple, common sense steps to improve preparedness."

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