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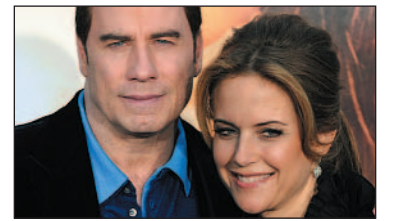
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CALIFORNIA, OREGON AND WASHINGTON

Before a quake hits, you'll know about it

ShakeAlert early warning system gets closer to reality

By Bailey Bedford
Correspondent

As you peer out the window of a BART car, you notice that the train is starting to slow, even though there's no station nearby. Then, before you can turn to ask fellow passengers what's going on, a distinct tone starts blaring from the cell-phones all around you.

"Earthquake! Earthquake! Expect shaking," your smartphone's screen reads. "Drop. Cover. Hold on. Protect yourself now." Seconds later, the train begins to rattle.

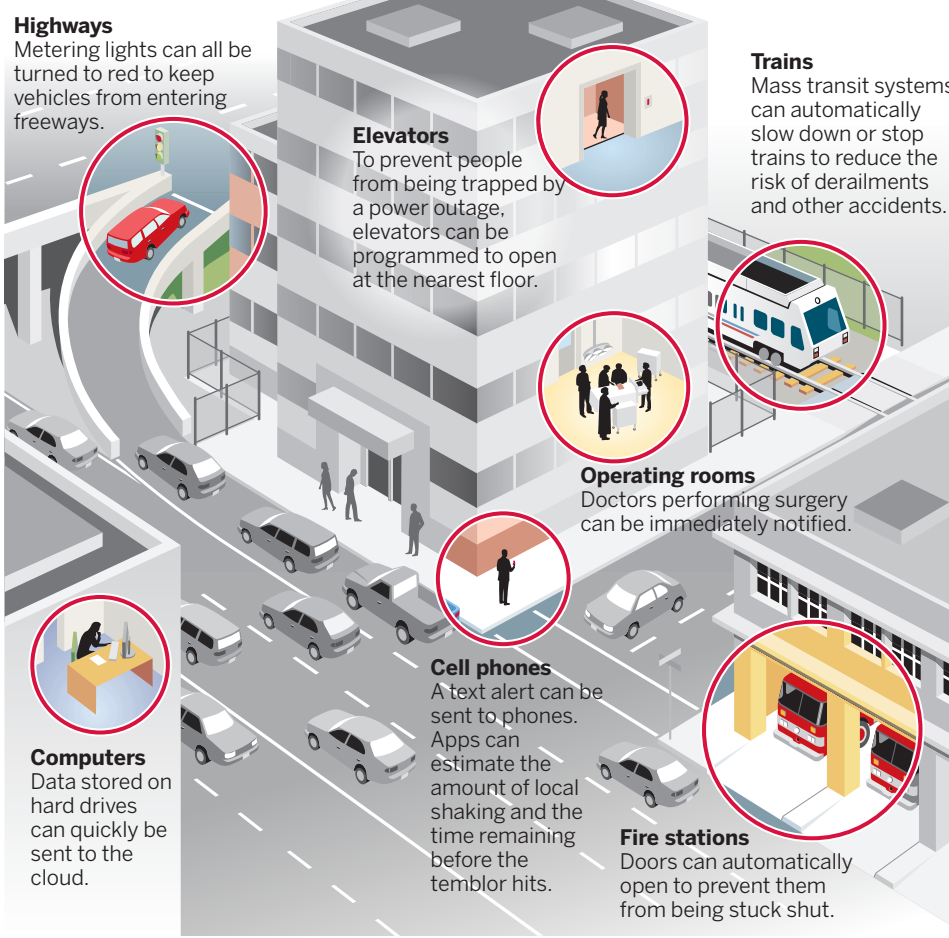
That's the kind of scenario envisioned by the planners of ShakeAlert, an earthquake warning system for California, Oregon and Washington. After more than a decade in development, it is finally about to become a reality for tens of millions of West Coast residents. The system is designed to alert them just seconds before the shaking starts so they can take cover or find a safer place to ride out the quake.

"The biggest commodity within the world of earthquake

SHAKEALERT » PAGE 5

TURNING SECONDS OF WARNING INTO ACTION

Here are some of the ways the new ShakeAlert system can help minimize fatalities and injuries, in addition to speeding recovery efforts:



DOUG GRISWOLD/SPECIAL TO THE BAY AREA NEWS GROUP

SPARKED IN CALISTOGA

PG&E cleared in Tubbs Fire

Cal Fire investigators say damaged, privately owned pole caused deadly 2017 blaze

By Matthias Gafni, Julia Prodis Sulek and George Avalos
Staff writers

SANTA ROSA » State fire investigators announced Thursday that the deadly 2017 Tubbs Fire that swept through Santa Rosa and killed 22 people was caused by a "private electrical system" centered around a woodpecker-weakened pole — and not PG&E as was widely speculated.

Lead Cal Fire investigator John Martinez wrote in his 80-page report that the fire started adjacent to a home at 1128 Bennett Lane in Calistoga, and was an "electrical-caused fire originating from an unknown event affecting privately owned conductor or equipment." A caretaker of the property said the privately owned wooden pole that distributed power throughout the rural property was so deteriorated that he planned to replace it the next spring.

"(It was) just about to be replaced because it had been wood-peckered so damn bad, but it was here and it was holding," caretaker Mike

TUBBS » PAGE 8

"There is absolutely no need for a bailout for PG&E. There might not even be a reason for PG&E to file for bankruptcy."

— Sen. Jerry Hill

NEW DEVELOPMENT LOANS

Bay Area leaders launch \$500M housing fund

By Marisa Kendall
mkendall@bayareanewsgroup.com

Bay Area power brokers fired a major shot in the fight against the housing shortage Thursday, as tech leaders, elected officials and philanthropists came together to launch what is poised to become the region's largest investment fund for affordable housing.

With backing by the Chan Zuckerberg Initiative, the San Francisco Foundation, Facebook, Genentech and others, the new \$500 million fund promises to build or preserve more than 8,000 homes in the five-county Bay Area over the next five to 10 years.

"I think it really has come to a point where we all need to get together and really think

PARTNERSHIP » PAGE 5



Second-graders from Washington Elementary school in San Jose participate in the "Great California ShakeOut" event under the watchful gaze of their substitute teacher Edith Garcia at the Tech Museum of Innovation in San Jose in 2013.

STAFF FILE PHOTO

BIPARTISAN MEETINGS CONTINUE

Senate rejects 2 bills to end shutdown

By Erica Werner, Sean Sullivan and Mike DeBonis
The Washington Post

WASHINGTON » The Senate blocked two competing bills Thursday to reopen the federal government, demonstrating that neither President Donald Trump nor the Democrats has produced a plan so far that can end the nation's longest government shutdown.

The twin failures came on the

shutdown's 34th day, and were the first Senate votes to address the crisis that has deprived 800,000 federal workers of paychecks while undermining crucial government services across the nation. The failure of both bills was expected, and the path forward is now uncertain. But there was a recognition on all sides that some new solution must now emerge if the shutdown is to end.

In one potentially hopeful sign, Democrats in the House plan to

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Senate Majority Leader Mitch McConnell, R-Ky., departs the Senate chamber Thursday.

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ShakeAlert

FROM PAGE 1

early warning is time," said Robert-Michael de Groot, a U.S. Geological Survey scientist who is one of the coordinators of the ShakeAlert system.

Built on top of several dangerous fault lines, California already has more than 600 seismic sensors feeding data to ShakeAlert. Most are located on or near major faults and population centers along the coast.

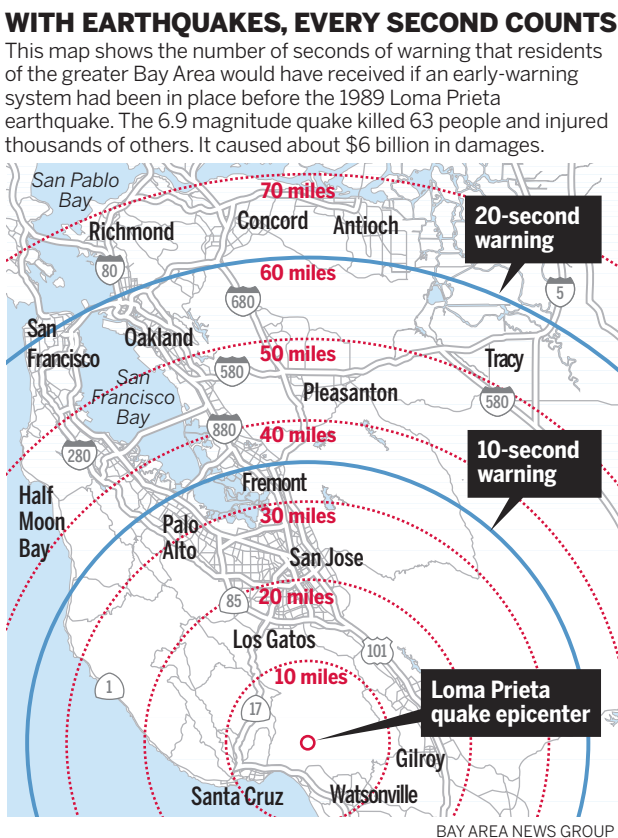
Businesses and public agencies such as BART are already acting on alerts from the system. And the city of Los Angeles this month unveiled a pilot program aimed at alerting L.A. County residents of earthquakes of magnitude 5.0 or greater via a cellphone app, as government agencies and private firms continue to develop and test ways to expand the system for broader public use.

Depending on someone's distance from the epicenter, the warning will range from a few seconds to tens of seconds.

USGS started developing ShakeAlert in 2006 with the help of partners that include UC Berkeley, the California Institute of Technology and the Southern California Earthquake Center. The project has received more than \$100 million in funding from the federal government, the California Governor's Office of Emergency Services and private sources such as the Gordon and Betty Moore Foundation.

In his first budget, Gov. Gavin Newsom this month set aside \$16.3 million from the state's general fund to finish the ShakeAlert system.

Several countries, including Japan, Mexico, China, Turkey and Romania, already have earthquake warning systems in place. The warnings are broadcast on television and radio and are sometimes blasted from municipal loudspeakers. Japan's system, widely



Loma Prieta quake epicenter

BAY AREA NEWS GROUP

seen as the most advanced, can send alerts to certain brands of cellphones. The system went live in 2007.

Some elected officials in California have bemoaned the fact that a statewide system is not yet up and running. But many scientists point out that unlike other countries with major earthquake faults, the United States has not had a quake of magnitude 7.0 or greater since the 1906 San Francisco earthquake, so U.S. funding priorities for an early warning system haven't been as urgent as in other quake-prone countries.

"The system in Japan was developed as a result of the 1995 Kobe earthquake," de Groot said. "And it took Japan roughly 10 years to develop their system. So I don't think ShakeAlert in its development stages has really been slower than other countries."

In addition, de Groot said, "We are arguably building the most advanced early earthquake-warning system in the world, so it takes longer to develop and test."

USGS estimates that the

three-state ShakeAlert system will cost \$39.4 million to build, but those costs could still rise if states are not provided adequate use of existing communication systems and must build their own data infrastructure. The system will cost \$38.4 million per year to maintain and operate, according to USGS estimates.

California's portion of the system is now only half finished. But with the recently secured state and federal funding, California's network of 1,115 seismic sensors and about two-thirds of the system in the Pacific Northwest should be completed within the next two years, USGS says.

The earthquake warnings are possible because when a fault slips, it generates two kinds of waves. The initial waves travel faster but are weaker than the more damaging second set of waves.

When seismic sensors detect the first waves, they will quickly send alerts to monitoring centers in Seattle, Menlo Park, Berkeley and Pasadena. Within about 5 seconds, computer algorithms will then an-



DAN COYRO — SANTA CRUZ SENTINEL ARCHIVES

Community members stream into Ford's department store to help dig out victims minutes after the Loma Prieta Earthquake struck on October 17, 1989.

alyze the data to rapidly identify the epicenter and strength of the earthquake and decide whether the temblor will be powerful enough to warrant an alert.

Then the real challenge begins — getting a short, clear message to millions of people within the next 10 seconds.

"It ceases to be earthquake early warning when you get the message 30 seconds later," de Groot said. "It's earthquake notification."

Sharie Starkie, a Redwood Estates resident who was working at a small technology company in Sunnyvale when the 1989 Loma Prieta earthquake struck, believes the system could be a lifesaver.

Starkie recalled that she had just finished putting items away in the stockroom when the shaking started that October afternoon. "I remember the shelves were just falling into each other and thinking how lucky I was that I was not back in that shelving at that time," she said.

With a 5- to 10-second warning, Starkie said, she would have been able to get outside the building instead of having to stand in a doorway.

The ultimate goal is to send the alerts to every cellphone in the quake zone,

but that's one of the biggest technological hurdles.

While the government can use the Federal Emergency Management Agency's Integrated Public Alert and Warning System to communicate with the public through television, Amber Alerts and other methods, the system isn't currently fast enough for earthquake warnings. Cellphone alerts can take tens of seconds, or even minutes, to be delivered.

ShakeAlert officials say warnings also will be sent to public announcement systems, as is currently being done in Los Angeles City Hall. And the private sector is now developing the equipment to alert the public and trigger lifesaving actions such as shutting off gas lines to help prevent fires, opening doors at fire stations to ensure that engines aren't trapped inside, and stopping elevators at the closest floors.

BART began using the alerts to decrease the speed of trains in 2012, said Anna Duckworth, a BART spokeswoman, who argues that a 10-second warning can be significant.

"It may not seem like a lot of time, but in those 10 seconds if we could slow (a train) down to almost half the speed it was going, that's critical to preventing

derailments," she said. "It can stop people from getting hurt in the case of violent shaking, and in the long run it helps keep the system operational because we can minimize damage."

But ShakeAlert, de Groot said, "is not going to be the panacea."

Depending on the speed of the technology and the distance from an epicenter, warnings will not always be possible. And there always will be the possibility of false alarms.

Margaret Vinci, ShakeAlert's Southern California coordinator, said California is "a very complex earthquake area" and that makes accurate warnings more challenging. The state can be having more than one earthquake at a time and that can make identifying tremors within milliseconds hard to get right, she said.

"Our sensors also pick up all ground motion," Vinci said. "It could be a nuclear blast in North Korea. It could be a quarry blast. It could be a sonic boom."

But, she suggested, occasional false alarms might serve as reminders of the need for Californians to get ready for the Big One.

"We have to be prepared," de Groot said. "ShakeAlert is one part of that preparedness."

Partnership

FROM PAGE 1

about that complex, comprehensive solution that we need in the Bay Area for everyone to thrive, especially the most vulnerable," Priscilla Chan, co-founder of the Chan Zuckerberg Initiative, said from the stage of the Commonwealth Club in San Francisco.

Thursday's announcement comes as Bay Area tech companies are facing mounting pressure to help ease the housing crisis. Gov. Gavin Newsom, who has made housing one of his top priorities, earlier this month urged California corporations to match the \$500 million he intends to set aside for middle-income housing. The announcement also comes on the heels of Microsoft's \$500 million pledge for Seattle-area housing.

Each move is an attempt to ease the housing shortage driving up prices throughout the Bay Area and forcing low and middle-income workers to flee to cheaper communities, often hours away from their jobs.

Chan's appearance, as part of a panel on housing solutions, kicked off the Partnership for the Bay's Future — a group including Assemblymember Da-

vid Chiu, San Jose Mayor Sam Liccardo, Kaiser Permanente, the San Francisco Foundation and the Chan Zuckerberg Initiative, the philanthropic organization Chan founded with her husband, Facebook CEO Mark Zuckerberg.

The partnership intends to invest \$500 million in loans to build new affordable housing and preserve existing units. More than \$260 million has been raised so far, including \$40 million from the Chan Zuckerberg Initiative, \$5 million from Genentech and \$1 million from the Silicon Valley Community Foundation.

The money will fund projects in San Francisco, Santa Clara, San Mateo, Alameda and Contra Costa counties, for residents making up to 150 percent of the local area median income.

Its first investment will be a revolving line of credit to the East Bay Asian Local Development Corporation, which is expected to back six projects over the next five years.

In addition, the Partnership for the Bay's Future is launching a separate fund of \$40 million to help Bay Area cities and counties reshape their housing policies. That money may be used, among other things, to help local officials craft just cause eviction ordi-



DYLAN BOUSCHER — STAFF PHOTOGRAPHER

Priscilla Chan, right, of the Chan Zuckerberg Initiative discusses Partnership for the Bay's Future, a new fund for housing development, on Thursday. At left is Pastor Paul Bains.

nances, rental assistance programs and other tenant protections, shape bonds to finance affordable housing, or remove the red tape around development by changing zoning laws.

Partners anticipate the \$40 million fund will help protect up to 175,000 households from displacement over the next five years.

That second, smaller policy fund has raised almost \$20 million so far — including another \$10 million from the Chan Zuckerberg Initiative, \$1.5 million from the San Francisco Foundation, \$5 million from Genentech and \$1 million

from Facebook. The fund managers expect to open applications to Bay Area cities and counties during the first half of 2019, and make its first grant before the end of the year.

Forming a partnership that crosses county lines and spans multiple sectors is a milestone in and of itself, and one that took two years of discussions, those involved said Thursday. Many of the Bay Area's 101 cities and nine counties have been striving to solve the housing crisis individually, but none have figured it out, said Chiu. A new, regional approach is needed.

"It's my hope that this moment is an inflection point," he said during a press conference following the Commonwealth Club event. "This is hopefully going to be the beginning of when we said we finally started to address the housing crisis."

Liccardo agreed. "We aren't going to solve it by just building housing in Oakland, San Francisco and San Jose," he said.

When asked by an audience member how the Bay Area can get local tech companies to invest in housing, Chan and the other panelists on stage at the Com-

monwealth Club paused, and then broke into uncomfortable laughter.

After a moment, Chan said she's seeing a lot of interest from tech companies wanting to get involved, which wasn't the case two or three years ago, when the corporate world shunted the issue aside.

"I think we're just cracking open the beginning of what's possible," she said, "once we can actually all sit down and be on the same side of the problem."

Local affordable housing advocates applauded Thursday's announcement.

"From my perspective, Bay Area tech companies have until now mostly been missing in action on putting their money where their mouth is and creating new affordable housing," said Matt Schwartz, president and CEO of the California Housing Partnership, which consulted with the Chan Zuckerberg Initiative before Thursday's launch, and has received funds from the organization in the past. "But having Facebook out in front, through Chan Zuckerberg, is a really exciting development and I hope that it will be seen as a challenge by the other tech companies."

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Shutdown

FROM PAGE 1

unveil a border security proposal of their own today that's expected to meet or exceed the \$5.7 billion Trump has demanded to build new walls along the U.S.-Mexico border. The House Democratic proposal will not allocate any money for the wall, but the large new sum being put on the table could form the basis for some kind of compromise.

In the Senate, bipartisan groups of senators continued to meet behind the scenes to discuss a larger deal that could offer an exit ramp, potentially one including greater protections for certain groups of immigrants.

"I would urge all of our

colleagues now that we've had these two failed votes," said Sen. John Cornyn, R-Texas, "we know we're right where we started when we got here today, that we work together to try to bridge our differences to build consensus and end this shutdown."

The first bill the Senate defeated was a proposal from Trump to reopen the government through Sept. 30 while spending \$5.7 billion to erect more than 200 miles of new border walls, clamp down on asylum seekers and provide temporary deportation relief to about 1 million unauthorized immigrants whose protections Trump previously had sought to end.

The vote was 50-47, short of the 60 votes needed to advance. GOP Sens. Mike Lee of Utah and Tom Cotton of Arkansas voted with the majority of Democrats against

the plan, while Sen. Joe Manchin, D-W.Va., joined Republicans in supporting it.

The second vote was on a short-term spending bill from Democrats that would have reopened the government through Feb. 8 without any additional wall money, to allow for negotiations on border security with the government open. Both bills contained billions for hurricane and wildfire disaster relief, although the figure in the Democratic bill was higher because it included aid to Puerto Rico that Trump has opposed.

The vote on the Democrats' bill was 52-44, also short of 60, with Republican Sens. Susan Collins of Maine, Lisa Murkowski of Alaska, Cory Gardner of Colorado, Lamar Alexander of Tennessee, Johnny Isakson of Georgia and Mitt Rom-

ney of Utah defying Trump to join all Democrats in voting in favor.

The votes unfolded as a couple dozen House Democrats crowded into the Senate chamber to watch, including many of the newly arrived freshmen who flipped the House from GOP control only to arrive in Washington in the midst of a government shutdown they have limited ability to solve.

Afterward, a bipartisan group of 16 senators began to take turns speaking on the Senate floor to call for reopening the government for three weeks while finding a compromise on border security — a solution the White House has rejected in the past.

"We just had two messaging votes, both of those votes failed," said Murkowski, one of the lawmakers. "My mes-

sage to people is don't give up hope because now is the time that we all must come together to address these issues. But you can't do it when the government is shut down."

Sen. Christopher Coons, D-Del., also spoke, saying: "We have to be able to do this."

The developments came as federal employee unions issued renewed warnings about impacts on federal services, including air travel. At the same time, Commerce Secretary Wilbur Ross questioned why federal workers are visiting food banks during the partial government shutdown, saying they should instead seek low-interest loans from banks and credit unions to supplement their lost wages.

"I know they are, and I don't really quite understand why," Ross said on CNBC when asked about federal

workers going to food banks. Ross is a billionaire and a longtime friend of Trump.

His comment drew immediate criticism from House Speaker Nancy Pelosi, D-Calif.

"Is this the 'Let them eat cake' kind of attitude?" she said. "Or call your father for money?"

Trump suggested Thursday that grocery stores and banks will give a break to the 800,000 federal workers who are without pay due to the partial government shutdown.

He claimed that grocery stores would "work along" with furloughed employees because "they know the people" and have been "dealing with them for years."

Trump added that banks, too, are "working along" with furloughed federal employees.