



UC Berkeley helping make BART quake-ready

By: **Will Reisman** | 09/27/12 8:38 PM

SF Examiner Staff Writer

Operating a transit system in one of the most earthquake-prone areas in the country can be a perilous task. Knowing this, BART is taking no risks.

Working with UC Berkeley, the transit agency is the first in the nation to install an automated early warning earthquake system, which will provide BART with precious extra seconds to slow down or stop trains before a tremor hits the tracks.

Scientists from UC Berkeley have installed seismic recording equipment in more than 200 locations statewide. The instruments provide live data readings on local earthquakes. BART is now plugged into that network, and when a reading exceeds basic thresholds for ground movement, the agency's new system will automatically slow down or stop trains based on seismic severity, said Peggy Hellweg, a UC Berkeley seismologist.

Depending on the quake's epicenter, BART could have up to one minute to prepare. The farther away the earthquake is, the more warning BART will have. An earthquake off the coast would give the agency 50 seconds to prepare. An epicenter near Loma Prieta mountain — site of the destructive 1989 quake — would give BART about 24 seconds to slow down or stop trains, Hellweg said.

Those extra seconds are key, considering BART trains travel up to 80 mph — speeds that could lead to derailments during an earthquake.

"The earthquake early warning system will enable BART to stop trains before earthquake shaking starts," said BART board of directors President John McPartland, "and thereby prevent derailment and save passengers from potential injuries."

BART has its own network of accelerometers — devices that detect ground movement — but those instruments don't automatically trigger reactions on trains. Instead, they send signals to the central command center, where engineers make the call.

With the automated system, delayed responses from human-reaction times would be eliminated, Hellweg said.



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Quick thinking: An early warning program developed by BART and UC Berkeley will monitor quakes statewide and automatically adjust train speeds to avoid accidents.

"When you're traveling behind someone while driving, it can take you five to seven seconds to react to their brake lights," Hellweg said. "That's the same kind of delayed reaction that can occur in the event of an earthquake, and those seconds can be vital."

BART will still have a full staff at its command center to provide backup in case anything happens to the data network established by UC Berkeley, Hellweg said.

Installing the equipment will not have a significant financial impact. The cost of the network will be \$40,000, just a small fraction of BART's \$530 million budget, said agency spokeswoman Luna Salaver.

wreisman@sfxaminer.com

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