Damage gauge coming to Transbay Tube

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Assessing any damage to the Transbay Tube after an earthquake will become more high-tech next year when BART installs a set of sensors on the underwater passageway.

In the past, any local earthquake or tremor would leave BART engineers scrambling to survey the entire 3.6-mile-long tube for damage.

A triumvirate of high-tech geological gadgets — accelerometers, displacement transducers and potentiometers — will be placed on the bay floor near the tunnel in order to pinpoint the shock wave effects of earthquakes.

With the new sensors, data immediately will show what portions of the passageway received the greatest strain during an earthquake, according to Molly McArthur, spokeswoman for the transit agency's Earthquake Safety Program.

"We'll have a real-time record for how the shock wave hit the tube," McArthur said. "We'll know immediately where we should focus our attention for repair and maintenance efforts. The fact is, we need every tool we can get for the Transbay Tube."

Along with detecting points of strain, the instruments will measure any shifts to the tube following a temblor, according to McArthur. BART will store and collect the seismic data, which also will be sent to city departments in Oakland and San Francisco and to the U.S. Geological Survey.

BART currently is retrofitting the Transbay Tube, which rests in a trench on the bay floor and allows trains to travel from the East Bay to San Francisco. Once the retrofit efforts are finished — the expected completion date is early 2011 — the new instrumentation will be put in place, McArthur said. The implementation of the technology will not affect BART service.

The USGS forecasts a 63 percent probability that an earthquake with a magnitude-6.7 or greater will strike the Bay Area in the next 25 years, meaning new seismological tools are paramount for understanding the effects of potential temblors, said David Oppenheimer, a seismologist with the government agency.

"This type of equipment will help determine if the design criteria of certain structures can truly withstand future earthquakes," he said.

Both the retrofitting and the technology upgrades fall under BART's Earthquake Safety Program, a $980 million bond measure that was passed by voters in 2004.

On Thursday, BART officials gave an informational presentation on the geological surveying equipment at a committee meeting of the Bay Conservation Development Commission, a state agency in charge of regulating shoreline projects.