Freeway to get land-shift monitors

JPL involved in project to record displacement between quakes

By Usha Sutliff
Staff Writer

PASADENA -- The Glendale (2) Freeway will be the first in the world used to monitor ground movement between earthquakes in a project that involves JPL and scientists from the United States Geological Survey in Pasadena.

Scientists plan to install highly sensitive devices, collectively called a laser strainmeter, parallel to the east side of the freeway next to the Mayor's Bicentennial Park.

The goal is to learn how much the earth moves between earthquakes and to identify which fault lines in the Los Angeles basin are more prone to temblors, said Ken Hudnut of USGS.

While the project is not intended to yield predictions, the information will be used in part by Caltrans and other government agencies including the Federal Emergency Management Agency and the Governor's Office of Emergency Services.

The laser strainmeter, expected to be up and running in about a year, will be housed about 2,000 feet apart in containers attached to bedrock. Those containers will be connected by a 6-inch diameter vacuum pipe about 18 inches above the ground.

A laser beam will travel back and forth inside the pipe to precisely measure the distance between the instruments and note any ground deformations associated with earth movement, Hudnut said.

"It's our intention to make it so that it's not either an eyesore or too obvious to people who might want to vandalize it," he said.

This is the first time a laser strainmeter has been placed in such an urban area, particularly along a freeway, Hudnut said. Once it is operational the instruments will be able to detect fault motion throughout the San Gabriel and San Fernando valleys.

It will cost about $450,000 to construct and run the devices for the first five years. The money mainly
comes from the National Science Foundation and the William F. Keck Foundation.

The laser strainmeter will work in concert with a global positioning system network spearheaded by NASA and the Jet Propulsion Laboratory that will ultimately have 250 stations in Southern California, including 15 in the San Gabriel Valley.

While those GPS stations serve basically the same function as the laser strainmeter, they don't do it nearly as accurately, said Frank Wyatt, a research engineer with UC San Diego and research investigator on the laser strainmeter project.

The GPS stations can detect deformations with one millimeter accuracy and the laser strainmeter has one micrometer accuracy, he said.

Wyatt and Hudnut are part of a geophysical research project headed by the Southern California Integrated Global Positioning Network consortium.

The members include the USGS, JPL and UCSD's Scripps Institute of Geophysics and Planetary Physics. The USC-based Southern California Earthquake Center oversees the consortium's activities.

-- Usha Sutliff can be reached at (626) 578-6300, Ext. 4458 or by e-mail at usha.sutliff@sgvn.com.