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## OLD TIRES TO GET NEW LIFE AS BART SHOCK ABSORBERS

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Thousands of cars are expected to be removed from Bay Area freeways with the project to extend BART to San Jose.

But cars -- or more specifically, their old tires -- are also shaping up to be a key building material for the job.

Construction crews plan to use at least 250,000 old tires, ground up into 3-inch chunks and laid under large sections of the tracks, to act as shock absorbers, reducing vibration and noise along the route as BART is built from Fremont to San Jose's Berryessa neighborhood in the next seven years.

State officials plan to announce details of the tire project this week.

Sending trains over a bed of shredded rubber tires will cost about \$1.5 million less than traditional noise-reduction methods, say supporters of the idea. It also helps create a new market for about 40 million tires that California residents discard every year, which can clog landfills, end up in piles that can cause toxic fires, or fill with rain and breed mosquitoes.

"Tires are a valuable resource. They are almost indestructible," said Stacey Patenaude, a materials recycling engineer with the state Department of Resources Recycling and Recovery in Sacramento. "It's incredible that we actually throw them away."

Under the BART plan, crews will dig down about two feet and lay an 18-inch layer of shredded tires, then encase them in fabric. The tires will be compacted and covered in gravel, with the tracks built on top. The material, called TDA, or "**Tire Derived Aggregate**," costs about \$150 a foot, said Patenaude.

A more traditional method of reducing train vibration, by building the tracks on top of rubber mats and concrete slabs, costs about \$250 a foot, she said.

The most expensive technique can cost up to \$900 a foot. In that method, called a floating slab, crews build concrete trenches and sit the tracks on top of large rubber discs, which act like shock absorbers.

"Everybody wants mass transit," said Patenaude. "If you can save money and still accomplish what you need to do, that's a win-win."

Through programs funded by a \$1.75 fee on the purchase of each new tire, the state has diverted about 70 percent of California's waste tires -- up from 34 percent in 1990 -- for other uses, including rubberized asphalt, athletic tracks and crash barriers. They are also burned in cement kilns for fuel. Others are retreaded.

About 660,000 shredded tires were used to build the Dixon Landing Road onramp at Interstate 880 in Milpitas a decade ago.

"It saved Caltrans \$250,000 that they would have spent buying crushed volcanic rock from Oregon," said Patenaude.

State officials have paid for tests to see whether the tires, which contain petroleum products and metals, leach toxics into groundwater. Although small amounts of iron and manganese were detected, they are in low levels below health concerns, said Patenaude. Tests also were done in which tiny shrimp were placed in the runoff water and suffered no health consequences, she said.

The idea of laying the old tire chunks under railroad tracks, still in its relative infancy, began in earnest in Silicon Valley. Ten years ago, the Valley Transportation Authority used them for 2,200 feet of the route from downtown San Jose to Campbell when the agency extended its Vasona line.

"It has exceeded our expectations for long-term performance," said Bernice Alaniz, a VTA spokeswoman.

The plan to bring BART to San Jose has three main phases. The first is a five-mile section that will extend from Fremont south to Warm Springs. Crews are already working on that stretch, and the line is scheduled to open to the public in 2014.

BART spokesman Linton Johnson said the shredded tires will be used in sections of the line, although he said exact amounts won't be known until the final construction contracts are awarded.

The next section will run 10 miles from Warm Springs to the Berryessa neighborhood in North San Jose at Las Plumas Avenue. Construction will start in 2012. That section will use 7,800 feet of shredded tires and 7,500 feet of the floating slab method to cut vibration in areas where buildings are closest to the track or the most sensitive structures, like hospitals, are located, said Alaniz.

The final six miles, from Berryessa to Santa Clara, involve digging tunnels under downtown San Jose. No firm dates are set yet because funding has not been secured, although some estimates place completion at 2025.

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