

The Fix Is In

MTC Pushes Ahead with Controversial East Span Fix Which Excludes Rail as U.C. Structural Expert Challenges Caltrans to Prove New Bridge Can Survive a Car Bomb



by Robert Freehling

Employing high-security procedures and armed agents, Gov. Davis held a groundbreaking and campaign event January 29 to start constructing a replacement East Span for the San Francisco-Oakland Bay Bridge.

The single-tower, self-anchored asymmetrical suspension span, a part of one of the nation's most important bridges, will not receive the same security protection, according to Bay television station KTVU Channel 2. KTVU reported that the bridge is uniquely vulnerable to a small terrorist bomb.

Though warned repeatedly by a University of California expert on structural safety, Caltrans says it never looked into the matter. This security lapse may trigger an investigation by the US Congress' General Accounting Office (GAO) for a bridge that has risen over 1000% from original repair cost estimates.

U.C. Berkeley Engineering Professor Abolhassan Astaneh, who was brought in by the federal government to analyze the World Trade Center collapse, says "Until bridge designers show that the bridge can tolerate a car bomb placed on it and exploded, they should not build it."

Professor Astaneh has harbored concerns about the stability of the new bridge design from the beginning. He says the reason he is going public with his bomb analysis is that federal and state officials have refused to examine the issue. "I presented to them my concerns, but they said we are only charged to look into seismic [concerns]," said Professor Astaneh.

According to a recent article in the UC Berkeley *Daily Californian*, Astaneh's relationship with Caltrans began in 1991 with grants to research seismic safety of the Bay Bridge. Caltrans provided \$50,000 after the 1989 Loma Prieta earthquake to study damage to the bridge, and later, \$500,000 to study safety retrofits. Caltrans terminated its grants in 1998 after he questioned the stability of the proposed bridge. "Caltrans does not accept dissent, but safety concerns should not be disregarded," Astaneh says.

Professor Astaneh, a widely respected structural expert, risks future state funding by speaking out. His viewpoint is that Gov. Gray Davis and Bay Area officials should demand that Caltrans engineers analyze the terrorist threat, and determine whether the new bridge will withstand any explosion at least as well as the current bridge.

The east span will include the first large self-anchored bridge; only two small ones in Asia exist. T.Y. Lin, the world-famous bridge designer, called the self-anchored design "a monument to ignorance," and said it lacks the stability of ordinary suspension bridges.

The roadway deck is to be put under 100 million pounds of compression with the cables pushing the tension forces inward at the deck ends like a tightly-wound spring. Computer analysis demonstrates that as little as 200 pounds of conventional explosives could upset the balance, buckle the road, and fold up the bridge catastrophically.

Ordinary suspension bridges, like the west span of the Bay Bridge and the Golden Gate Bridge, are robust because they consist of independent segments hung from the main cable. Bombs could damage an isolated segment but would not destroy the bridge.

Astaneh points out the irony that the existing east span is a robust design without any design weakness that could be exploited by terrorists, yet is being replaced by one that is vulnerable. Caltrans sources told KTVU its design would not be changed, while admitting Caltrans engineers never did any specific terror threat analysis.

A computer-based test can be conducted for only \$500,000 to verify whether the self-anchored bridge could withstand an explosion. Astaneh says if the tests provide any results suggesting the bridge would not withstand an explosion, this would be "the best \$500,000 they ever spent." He adds that such a test would look not only at potential terrorist attacks but even at the destructiveness of a burning fuel truck, which could cause the planned bridge to buckle.

But Caltrans spokesperson Colin Jones told the *Daily Cal* that the department is mainly concerned about the seismic stability of the bridge, and that testing for resistance to car bombs or explosions is unnecessary. "We've never had a history of a terrorist attack on the bridge," Jones said.

Jones said the bridge would conform to current codes and that California's Highway Patrol is trying to avoid explosions on the bridge by banning trucks carrying explosive materials. "Have other bridges and structures been studied for that?" Jones asks. "As far as I know, they haven't."

Gov. Davis' warning in November about possible attacks on California bridges proves that bridges are indeed at risk for terrorism. In the wake of September 11, key bridges like the Bay Bridge, used by 280,000 cars each day, should be designed to resist explosions even if today's codes do not explicitly require it. They were written years ago, long before the reality of terrorism had set in.

Security of transportation and other infrastructure is a growing concern. The FAA has been working to get more sturdy doors and bulkheads on aircraft, while Sandia Laboratories trains government agencies to make their structures more immune to terrorist attack. Last October, engineers from all

over the country met to consider how to make large structures more secure. Bridge designers in New York have already contacted a San Francisco firm that specializes in modeling structural failures. "It is ironic that people from New York are coming here to get expertise to see if bridges can withstand car bombs, but here in California the bridges are not being tested," Astaneh said.

According to the *Daily Cal*, Eve Hinman, president of the firm, says a test on the Bay Bridge would probably reveal it to be safer to connect the cables to anchorage blocks on land than a self-supported anchorage block. "I don't think the terrorist threat is being taken seriously in San Francisco," she says.

Plans for the controversial east span are allegedly finished, except for a few troublesome details. Construction officially began at the January ceremony. The critics were declared "silenced," and the first contract signed. All was going very quietly ahead. Yet, conspicuously missing from the ceremony was the Mayor of San Francisco, the city that holds up half of the Bay Bridge.

Also missing is the rail facility that San Francisco, Berkeley, Oakland, and Emeryville voters asked be studied, which could have given the bridge a purpose of expanded transbay mobility, instead of just replicating the existing gridlock on a new structure.

Another missing item was an agreement with Oakland for use of a multi-million dollar construction staging area. Caltrans decided to set up shop on the site without permission, leading to a lawsuit and direct action by the City and Port of Oakland to oust Caltrans from city property.

Caltrans officials and former Bay Bridge Task Force chair, Mary King, were outraged at the city's stance. After all, Caltrans had been negotiating before it just decided to grab the property. Specifically named in the suit is Caltrans director Jeff Morales. Capitol insiders say Morales has been under constant pressure by Governor Davis to advance the project. Until it receives payment, the City of Oakland has posted a lone unarmed guard to block Caltrans crews from starting work on the \$3 billion bridge.

MTC's Unbelievable Rail Costs

Meanwhile, costs for Bay rail crossings ranging from \$10.3 to nearly \$12 billion were augured by the Metropolitan Transportation Commission (MTC). Korve Engineering did the work using Parsons-Brinckerhoff as a subcontractor. MTC foresees a drilled tunnel instead of a tube, and wants a maximum grade of only 1.5%. Given the required depth to get to safely drillable soil, this means the line is in tunnel miles from the bay.

MTC claims a new 4-mile BART subway from San Francisco to Oakland costs \$10.3 billion. A 4-mile train tunnel for commuter trains or high-speed rail is priced at \$11.8 billion. For comparison, this is more than France has spent for 800 miles of high speed rail lines. It is also more than the longest rail tunnel ever built, Japan's 33-mile undersea Honshu-Hokkaido tunnel, which is three stories high and 800 feet deep, and took over 20 years to build, yet cost only \$7 billion.

Understandably, MTC's press spin was to try to counter disbelief by experts and public alike. "At first blush, it seems like a lot, and people are going to do a double-take," said Randy Rentschler, spokesman for MTC. "But if you take that second look, you realize that these are major improvements, and they're going to carry a big price tag." Some who have taken that second look disbelieve MTC's price figure even more.

George Haikalis, a civil engineer and transportation planner, as well as former Director of Research for the New York area's Tri-State Regional Planning Commission says "MTC's \$10.3 billion seems unrealistically high." He points out that the present BART tube was built for only \$180 million in 1970. Assuming that MTC allows consideration of a reasonable design, many experts believe a tube could be built for under \$2 billion.