

# Making ends meet in California

Caltrans' accelerated bridge construction methods and a hungry construction market are two ways the agency is stretching its dollar in a climate of cutbacks and mandatory furloughs.

All states are facing some degree of financial crisis, but none quite as severe as California. Saddled with a \$24 billion budget deficit during the past fiscal year, the nation's most populous state declared a fiscal emergency, sought deep cuts in services, let go of thousands of employees, borrowed billions and issued IOUs for only the second time since the Great Depression. No surprise, efforts to stem the riptide of red ink have affected the majority of state agencies, including the California Department of Transportation.

While Caltrans hasn't been immune to mandatory furloughs and reductions in new projects, the outlook isn't all doom and gloom. Thanks to a highly competitive construction market and accelerated bridge construction techniques, Caltrans is continuing to deliver projects, including the nation's largest bridge replacement project.

To find out more about what Caltrans is doing to overcome funding shortfalls, *Transportation Point* spoke with Kevin Thompson, state bridge engineer and deputy division chief of structure design. Below are excerpts from the conversation:

## TP: Describe Caltrans' financial state.

**THOMPSON:** State revenues are below projections and have been for some time, which means we are operating at a deficit. Like other state agencies, we have been required to take three mandatory furlough days every month. In simple terms, that translates to about a 14 percent reduction in capacity to deliver projects, which is commensurate to a reduction in delivering new transportation construction and rehabilitation projects.

The California Transportation Commission votes on which projects go forward for contract advertisement. The CTC must approve all major highway construction contracts that go out to advertising from the department. Because of the current economic situation, it has reduced the number of new transportation improvement projects receiving funding.

The good news is Caltrans does not see a need to suspend projects in construction at this time. We anticipate we will keep all projects under construction continuing through the fiscal year.



**Kevin Thompson, PE**  
State Bridge Engineer/Deputy Division Chief  
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Among them is the largest bridge project in the United States—the San Francisco–Oakland Bay Bridge East Span Replacement Project.

## TP: How is Caltrans benefitting from the competitive construction market?

**THOMPSON:** I have 33 years of data on contracts that have been bid-opened and awarded by the department. This past fiscal year, Caltrans had opened bids on 666 contracts. Of those, we awarded 637 contracts and had an average of 7.8 bidders per contract. That's the highest average in our history. Graphically, it really stands out in comparison with previous years.

Caltrans is required by state law to award contracts to the lowest responsive bidder, which is simply the lowest bidder that has met the conditions of the contract. Five years ago, Caltrans opened bids on 450 contracts with an average of 4.6 bidders per contract (2003/2004 fiscal year). In comparing the low bid with the engineer's estimate, the total for all bids came in 28.7 percent over our engineer's estimate. This past July, the bid total for all projects was 24.1 percent under our engineer's estimate (2008/2009 fiscal year)—that's the lowest in Caltrans' history. What's more, from our engineers estimates have been adjusted to compensate for economic conditions.

Contractors are hungry, and our transportation dollars are going further. The cumulative savings helped us with other funding shortfalls and worked toward keeping projects moving forward.

## TP: How have the furloughs affected bridge maintenance?

**THOMPSON:** We still inspect bridges on a regular basis, but because of the mandatory furloughs, we have had to curtail some typical maintenance work. However, I want to emphasize there has been no compromise to public safety. If our bridge inspectors identify maintenance needs, which do not impact motorists' safety, we may delay the maintenance.

## TP: Describe Caltrans' ABC initiative and how it's stretching bridge dollars.

**THOMPSON:** ABC, accelerated bridge construction, is the use of construction techniques that significantly reduce on-site construction time. Alternative construction methods include use of precast or prefabricated structural elements. Bridge construction near the site, followed by moving those elements into place with self-propelled modular transport units or other hydraulic means have been used successfully in the past. Other ways to accelerate on-site construction include launching and segmental erection methods.

We've also accelerated projects by providing incentives. In 2007, a tanker truck caught fire on the I-880 connector ramp of the MacArthur Maze Interchange in Oakland. The fire caused two spans to collapse on the I-580 connector above. In less than one month, Caltrans had the ramp back in service. The contract was advertised with a \$200,000 per day incentive/disincentive clause, which was capped at \$5 million. The contractor was able to expedite the construction process with prefabricated steel girders and a precast concrete bent cap (span supporting beam). It was a big success story.

Another form of ABC is to close a structure completely, as we did with the San Francisco-Oakland Bay Bridge in 2007. After gaining the public's approval through significant outreach and education, Caltrans shut down the entire bridge for the Labor Day holiday and replaced a football-field sized section of the bridge just east of the Yerba Buena Island tunnel section.

The SFOBB was closed to traffic at about 10 p.m. that Friday night. The contractor then demolished the old section of the bridge. The substructure portion of the new bridge section had been constructed previously underneath, which included columns and footings. The new bridge section was then moved into place with steel skid sections and hydraulic rams. By Labor Day afternoon, the new bridge section was complete. It was a milestone in public awareness. Like the Federal Highway Administration's ABC motto, the public would rather have us get in, get out and stay out.

#### **TP: How does Caltrans offset the added expense of incentives?**

**THOMPSON:** We justify the expense through road user costs, the value of the system being open to the public. Caltrans estimated the I-580 ramp's closure cost, which is based on road user cost and economic impact to the region. The process in determining road user cost is under development and needs further research. Then, we took half that amount and offered it as an incentive to the contractor for each day shaved off the timeline, up to a maximum incentive amount. The contractor received the maximum incentive and the project was finished well ahead of schedule. Everyone looked at that as a win-win.

#### **TP: What about design-build as an acceleration method?**

**THOMPSON:** A legislative decision authorized the department to identify 10 design-build projects. We are in the process of selecting those candidate projects. I expect by January 2010, we will have four or five identified.

Ten projects should provide us with enough diversity to best assess how design-build could become an effective procurement method. It is another tool in the toolbox. Anytime you can add more tools, it's generally a good thing.

#### **TP: Aside from your responsibilities at Caltrans, you also are helping to establish a master's program in bridge engineering. Tell us about it.**

**THOMPSON:** This fall, with the support of the FHWA, the University at Buffalo, N.Y., launched a master of engineering degree with a concentration in bridge engineering. The courses are designed to help people, in roles similar to mine, advance their careers. My contribution to the program will be to support emerging technologies and public policy. If students do not wish to complete the entire master's program, they can enroll in those sections, attend online and receive a certificate. ■

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#### **ABOUT THE AUTHOR**

Kevin Thompson, PE, is the state bridge engineer for the California Department of Transportation. Thompson directs the work of approximately 350 people in five structure design offices. In addition, he is responsible for the work of all structure design technical committees and specialists in the review, approval and maintenance of bridge design standards and guidance material. Contact him at (916) 227-8807 or kevin\_thompson@dot.ca.gov.