

## Caldecott Tunnel Improvement Project

### New Tunnel Design

**Location: San Francisco Bay Area**

**Owner: Caltrans**

The Caldecott Tunnel connects Alameda and Contra Costa Counties via State Route 24. The Caldecott Improvement Project proposes to alleviate traffic congestion along Route 24 by constructing a fourth bore at an estimated cost of \$285M.

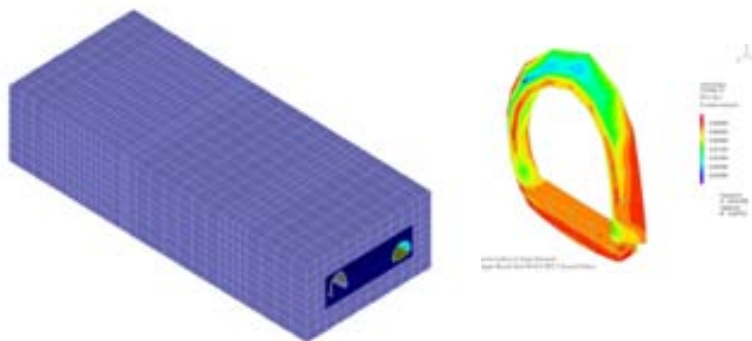
The Caldecott Tunnel has been an important link in the East Bay transportation network since the Kennedy Tunnel opened in 1903. The first and second bores were constructed in 1937. Each of these two bores is 3,619 feet in length and 26.7 feet in width. There are narrow walkways and no shoulders. The third bore was constructed in 1964 and is 3,771 feet in length and 34.5 feet in width with no shoulders but slightly wider walkways. Congestion and traffic delays have afflicted the Caldecott Tunnel since the 1960's. Planning of the fourth bore was anticipated and included in the design phase plan of the third bore final lining.



SC Solutions' scope included determination of the relative effects of placement of a fourth bore on the existing third bore due to construction and seismic loads. To accomplish this goal as well as establish the most efficient tunnel alignment, the proximity analyses were performed for the West and the East Portals.

Once the alignment was set, a construction sequence and seismic evaluation of the tunnel, was carried out. Effects of the initial liner degradation was also studied to determine its influence on the final liner design.

A separate three dimensional model was also created to focus on the local regions of the main tunnel liner to cross passage connections. The full time history analysis was carried out to determine the seismic response of these geometrically complex regions. The results of the analysis were used as the basis for determining the connection design



3D Cross Passage Evaluation Model and Modeling Details

