

# Caltrans Statewide Historic Bridge Inventory Update

## Tunnels



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## **Summary of Findings**

This report presents the findings of an evaluation of 14 tunnels constructed in California prior to 1960, in accordance with the eligibility criteria for listing properties in the National Register of Historic Places. This tunnel survey updates a portion of the Statewide Historic Bridge Inventory, completed in 1986 by the California Department of Transportation (Caltrans).

There are 49 tunnels in California on state highways and local roads that were built before 1960. Five of these are currently listed in the National Register of Historic Places: three as contributors to the Forts Baker, Barry, and Cronkite Historic District in Marin County; one as a contributor to the Presidio of San Francisco National Historic Landmark; and one as a component of the San Francisco – Oakland Bay Bridge. In addition, four tunnels on Highway 110 in Los Angeles are contributors to a pending National Register nomination of the Arroyo Seco Parkway. Seven other tunnels have previously been determined eligible for National Register listing: three which are contributors to the Feather River Highway (State Route 70) in Butte and Plumas Counties; the two Caldecott bores in Alameda and Contra Costa Counties; the Posey Tube between the cities of Oakland and Alameda; and the Stockton Street Tunnel in San Francisco.

Of the remaining 33 tunnels, four were excluded from the present survey because they are owned and maintained by the National Park Service. Three of these are in Yosemite National Park and one is in Fort Mason in San Francisco. Seven other tunnels were given a Category 4 (unevaluated) designation, as they are not individually significant but are associated with larger properties that have not yet been evaluated. Four of these are associated with railroads, two are on the Angeles Crest Highway (State Route 2) in Los Angeles County, a possible historic road, and one is associated with the Marin Circle landscape plan in the city of Berkeley.

This leaves 22 tunnels to be evaluated as part of the Statewide Historic Bridge Inventory Update. Eight of these were excluded from evaluation without field survey. Based on records available at Caltrans' Headquarters in Sacramento, it was clear that these eight tunnels either lack integrity or lack any potential to meet the National Register criteria. The remaining 14 tunnels were surveyed and are evaluated in this report.

This report concludes that five of the 14 evaluated tunnels are eligible for National Register listing:

- Waldo Tunnels, (27-0040L and 27-0040R) on Highway 101 in Marin County. Built in 1937 and 1954, the two bores share common portal structures and are considered a single property in this report. This property meets National Register Criterion A, for its association with the development of the Bay Area transportation network, and Criterion C, as a significant achievement in civil engineering and construction.
- Dornan Drive Tunnel (28C0318) in Richmond, Contra Costa County. Constructed in 1915, this tunnel meets Criterion A for its association with the development of the Point Richmond waterfront and municipal pier.
- Gaviota Gorge Tunnel (51-0172R) on Highway 101 in Santa Barbara County. Built in 1953, this tunnel meets Criterion C for its design qualities, which complement the dramatic setting of the Gaviota Gorge.
- Sepulveda Tunnel (53C0164) in Los Angeles. Built in 1929, this tunnel meets Criterion A, for its association with the development of the transportation network in metropolitan Los Angeles, and Criterion C, for the Art Deco design of its portals.

These tunnels were also evaluated in accordance with Section 15064.5(a)(2)-(3) of the California Environmental Quality Act (CEQA) guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code. The five tunnels which meet the National Register criteria are also considered historical resources for the purpose of compliance with CEQA.

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### Appendix B

Inventory and Evaluation (DPR-523) forms for tunnels that are ineligible for National Register listing

For individuals with sensory disabilities, this document is available in Braille, large print, on audiocassette, or computer disk. To obtain a copy in one of these alternative formats, please call or write to Andrew Hope, Caltrans Division of Environmental Analysis, P.O. Box 942874, MS-27, Sacramento, CA 94274-0001. (916) 654-5611 Voice, or use the CA Relay Service TTY number 1-800-735-2929.

## **I. Project Description and Scope of Survey**

In 1985-86, Caltrans carried out a statewide survey of bridges and tunnels, identifying those structures which meet the criteria for listing in the National Register of Historic Places. Because of the 50-year threshold for National Register listing, the original survey evaluated only those bridges and tunnels which were constructed in 1936 or earlier. Caltrans is now updating that survey, including the evaluation of roadway bridges and tunnels constructed prior to 1960. This update includes bridges and tunnels on or crossing state highways as well as structures owned and maintained by local governments. The 1960 cutoff date was chosen so that bridges will not need to be evaluated on a project-by-project basis for several years after the completion of the survey.

For the purpose of this Statewide Historic Bridge Inventory Update, separate evaluation reports have been prepared for the various structure types. Eight reports, as listed below, have previously been completed. This ninth report covers tunnels.

- Masonry arches (June 2003)
- Timber and concrete trusses, and suspension bridges (April 2004)
- Concrete box-girders (April 2004)
- Monumental bridges of Los Angeles (May 2004)
- Metal trusses (March 2004, revised September 2004)
- Concrete arches (April 2004, revised October 2004)
- Common bridge types (November 2004)
- Bridges that were not individually surveyed and evaluated (October 2005)

As described in the Summary of Findings, there are 49 roadway tunnels in California that were constructed prior to 1960. This report evaluates 14 of these tunnels, and concludes that five meet the criteria for listing in the National Register of Historic Places.

## **II. Field and Research Methods**

Between February and May 2003, qualified architectural historians working for Myra L. Frank & Associates, Inc. (now part of Jones & Stokes) surveyed and evaluated 13 of the 14 tunnels evaluated in this report. The remaining tunnel, the Dornan Drive Tunnel in Contra Costa County (28C0318) was surveyed and

evaluated by Caltrans' Research Associate David Lemon, working under the supervision of architectural historian Andrew Hope. On-site fieldwork for all of the tunnels included a complete visual examination and digital photographs of each structure. In preparing the evaluations, the information gathered from fieldwork was supplemented by other documentation on the state's tunnels, including:

- Bridge rating sheets from the 1986 statewide bridge survey
- As-built plans and bridge inspection reports
- Published articles from *California Highways and Public Works* and other periodicals

In addition, the following sources and repositories were consulted for background research:

- Caltrans Transportation Library & History Center
- California State Library, California History Room
- California State Archives
- *California Historical Landmarks* (State of California, 1996)
- *California Points of Historical Interest* (State of California, 1992)
- California State Railroad Museum, Library and Collections
- State Office of Historic Preservation, Historic Properties Inventory
- The National Register of Historic Places web site ([www.cr.nps.gov/nr](http://www.cr.nps.gov/nr))
- *Historic Highway Bridges of California* (Caltrans, 1990)
- Los Angeles Public Library: Photo and Regional History databases and LAPL catalog
- Santa Barbara Public Library

A completed survey report, prepared by Myra L. Frank & Associates, was transmitted to Caltrans in August of 2003. Subsequently, one tunnel evaluation was added to the report, as noted above, and revisions were made to the report by Caltrans staff. However, the conclusions with respect to the National Register eligibility of the tunnels have not been changed. This report's conclusions that the Waldo, Gaviota Gorge, and Sepulveda tunnels are eligible for National Register listing are consistent with the conclusions of the 2003 report completed by Myra L. Frank & Associates.

### **III. Public Participation**

In early April 2003, letters were sent to the county planning departments of each county in California, nine cities, and fifty-eight historical societies and historic preservation groups, informing them of the Statewide Historic Bridge Inventory Update and inviting their comments. Specifically, letters were sent to the following counties and cities which have tunnels that are evaluated in this report:

- City of Los Angeles, Cultural Heritage Commission
- City of San Francisco, Landmarks Preservation Advisory Board
- Contra Costa County Community Development Department
- Los Angeles County Department of Regional Planning
- Los Angeles County Department of Public Works
- Marin County Planning Department, San Rafael
- Placer County Planning Department, Auburn
- San Francisco County Planning Department
- Santa Barbara County Planning & Development Department

In addition, letters were sent to the following organizations which may have an interest in the tunnels evaluated in this report:

- Contra Costa County Historical Society
- Los Angeles Conservancy
- Marin Heritage, San Rafael
- Placer County Museum, Auburn
- San Francisco Architectural Heritage
- Santa Barbara Trust for Historic Preservation

In addition, the San Francisco Historical Society was contacted by phone regarding the Broadway Tunnel (34C0006). As of January 1, 2006 there have been no responses from any of the organizations listed above.

### **IV. Historic Overview**

There are 70 tunnels in California, with construction dates ranging from 1904 to the 1990s. The chart on the following page shows the number of tunnels constructed in each decade of the twentieth century:

<u>Dates</u>	<u># of tunnels</u>
Unknown date	1
1900-1909	2
1910-1919	7
1920-1929	5
1930-1939	23
1940-1949	1
1950-1959	10
1960-1969	8
1970-1979	6
1980-1989	3
1990-1999	<u>4</u>
Total	70

A substantial number of the tunnels constructed before 1930 were undertaken by cities as improvements to the urban transportation network. Among these are the tunnels on Third Street in Los Angeles (1907), Stockton Street in San Francisco (1912), and Dornan Drive in Richmond (1915). From 1930 on, new tunnel construction was predominantly on state highways and roadways linking cities, rather than within cities, with the California Division of Highways undertaking the majority of these construction projects.

There were two major periods of tunnel construction in California: the 1930s and the 1950s. A substantial portion of the state's tunnels were constructed in the 1930s, which was the era of great public works projects nationally. In addition to tunnels, California saw the construction of the San Francisco Bay and Golden Gate Bridges during this period. The 23 tunnels built in California in the 1930s fall into two periods: 1930-32 and 1935-38. The earlier period saw the construction of ten tunnels, including three in Yosemite National Park, three on State Route 33 in Ventura County, three on the Arroyo Seco Parkway in Los Angeles, and the Newcastle Tunnel in Placer County. The later period, from 1935 to 1938, saw the construction of 13 tunnels, including three on the Feather River Highway (State Route 70) in Plumas and Butte Counties, and several of the state's largest tunnel projects, such as the Yerba Buena Island, Waldo, and Caldecott tunnels in the San Francisco Bay Area.



A second period of tunnel construction was the early 1950s, when ten of the state's roadway tunnels were built. The California Division of Highways constructed the second Waldo Tunnel in this period, as well as the Gaviota Gorge Tunnel on Highway 101 in Santa Barbara County and the two Angeles Crest Highway (State Route 2) tunnels in Los Angeles County. In addition, the City of San Francisco constructed the Broadway Tunnel, while Los Angeles County built three tunnels in the mountains north of Los Angeles, on Baldy Road and Malibu Canyon Road.

The state's 70 tunnels are not widely distributed geographically. They are in only 16 of the state's 58 counties and are concentrated in the Los Angeles and San Francisco Bay areas. Los Angeles County has 27 tunnels, with Los Angeles, Ventura, and Orange Counties having 32 of the state's 70 tunnels (46 percent). The five San Francisco Bay Area counties of Marin, Contra Costa, Alameda, San Francisco, and San Mateo have 25 tunnels (36 percent of the total). The geographical distribution is similar for the 49 tunnels built before 1960. Twenty-one (43 percent) are in Los Angeles and Ventura Counties, while 18 (37 percent) are in the five Bay Area counties.

The median length of the 49 pre-1960 tunnels in California is 550 feet. Seventeen are more than 1000 feet long, with the five longest exceeding 1/2-mile in length:

- Wawona, Yosemite National Park, Mariposa County 4,236 feet
- Caldecott #1, Alameda and Contra Costa Counties 3,615 feet
- Caldecott #2, Alameda and Contra Costa Counties 3,609 feet
- Posey Tube, Alameda County 3,544 feet
- Fort Cronkhite, Marin County 2,689 feet

Of the 14 tunnels evaluated in this report, the longest is the Broadway Tunnel in San Francisco, at 1,850 feet.

Most of the state's tunnels were constructed by boring through hillsides or mountains, while a few were built using less typical methods. Several of the shortest tunnels were constructed as passages through berms carrying railroads or roadways. They are similar to concrete arch bridges or culverts but are classified as tunnels simply because they span roadways rather than waterways, and their width between portals is greater than the arch span. They were generally constructed at the same time as the berms that they pass through,

rather than being excavated through existing grades. The McClure Tunnel in Santa Monica (53-0008) was built using the cut-and-cover method, in which the tunnel lining was constructed within an open excavation and then covered. The Posey Tube, which was previously determined eligible for National Register listing, was constructed as a series of precast concrete tube sections, which were lowered into a trench crossing under the ship channel between the cities of Oakland and Alameda. This was the state's only tube structure (a tunnel under water) until the completion of the Bay Area Rapid Transit (BART) Transbay Tube in 1973.

The majority of the state's tunnels take the more traditional form of excavations through earth and rock. Most of these have an arched, concrete lining, while a few have only a layer of gunite (a form of sprayed-on concrete) over the walls of the excavation, with the interior of the tunnel retaining the rough surface of the excavation. Examples of unlined or only partially lined tunnels include the Baldy Road (53C0251 and 53C0503), Angeles Forest Highway (53C0601), and Malibu Canyon Road (53C0621) tunnels in Los Angeles County. These are all relatively short tunnels and serve relatively low traffic volumes. Among the tunnels with concrete linings, the unpainted concrete typically serves as the interior finish. In a few cases, the lining is clad in white or other light colored ceramic tiles to make the interior of the tunnel brighter and to facilitate cleaning. Examples include the Waldo Tunnels in Marin County (27-0040L and R), the Broadway Tunnel in San Francisco (34C0006), and the McClure Tunnel in Santa Monica.

Generally, all but the shortest tunnels have some form of artificial lighting. Of the 14 tunnels evaluated in this report, only the Angeles Forest Highway Tunnel (53C0601), with a length of 475 feet, lacks interior lighting. In addition to lighting, several of the state's longest tunnels have mechanical ventilation to bring in fresh air and flush automobile exhaust from the interior. Mechanically ventilated tunnels in California include the Airport Overcrossing of Sepulveda Blvd. in Los Angeles, the Posey Tube in Alameda County, and the Caldecott tunnels in Alameda and Contra Costa Counties, which range in length from 2,080 feet to 3,544 feet. There are also some tunnels of comparable length that are not ventilated, as they serve relatively low traffic volumes. The shortest

mechanically ventilated tunnel in the state is the Broadway Tunnel in San Francisco, which has a pair of two-lane bores of 1,850 feet each.

Although tunnels, like bridges, are utilitarian structures, the portals often provide an opportunity for architectural embellishment. The most distinctive tunnel portals in California are those of the Stockton Street Tunnel in San Francisco, which was determined eligible for National Register listing in the original statewide bridge inventory. The neoclassical portals of this tunnel include engaged columns on pedestals, ornamental keystones, a frieze with triglyphs, and a balustrade. In the late 1920s and 1930s, Art Deco motifs were incorporated into the portal designs for several California tunnels. Examples include the Caldecott Tunnel in Oakland, the four tunnels on the Arroyo Seco Parkway in Los Angeles, and the Sepulveda Blvd. Tunnel (53C0164), also in Los Angeles. In the more undeveloped areas of the state, attempts were made to design portal structures to be compatible with the tunnels' natural settings. The Gaviota Gorge Tunnel (51-0172R) in Santa Barbara County uses concrete that has been tinted and scored to give the appearance of masonry. Several of the tunnels in the mountainous portions of Los Angeles County (including five that are evaluated in this report) have portals of uncoursed or roughly coursed rubble masonry, constructed of rock taken from the tunnel excavation.

Tunnels continue to be planned and constructed for California roads and highways. Currently, planning is underway for the construction of a tunnel on State Route 1 in San Mateo County, to avoid the unstable coastal hillside at Devil's Slide. Caltrans is also studying the possibility of constructing a fourth Caldecott bore on State Route 24 in Alameda and Contra Costa Counties.

## **V. Resource Description and Significance**

The 14 tunnels evaluated in this report date from 1907 to 1954, and eight have passed 50 years in age since the original statewide bridge survey of 1985-86. Eight of the 14 tunnels are in Los Angeles County, with the other six in Placer, Marin, Contra Costa, San Francisco, and Santa Barbara counties. The following tunnels are evaluated in this report, with Inventory and Evaluation (DPR-523) forms included in Appendices A and B:

<b>Bridge #</b>	<b>Name</b>	<b>Date</b>	<b>Location</b>
19C0169	Newcastle	1932	Newcastle, Placer County
27-0040L	Waldo, Southbound	1937	Sausalito, Marin County
27-0040R	Waldo Northbound	1954	Sausalito, Marin County
28C0318	Dornan Drive	1915	Richmond, Contra Costa County
34C0006	Broadway	1952	San Francisco City and County
51-0172R	Gaviota Gorge	1953	Santa Barbara County
53-0008	McClure	1935	Santa Monica, L. A. County
53C0164	Sepulveda	1929	Los Angeles City and County
53C0251	Baldy Road #1	1951	Los Angeles County
53C0489	Soledad Canyon Road	1935	Los Angeles County
53C0503	Baldy Road #2	1954	Los Angeles County
53C0601	Angeles Forest Highway	1941	Los Angeles County
53C0621	Malibu Canyon Road	1952	Los Angeles County
53C1339	Third Street	1907	Los Angeles City and County

All of these tunnels consist of bores through hills or mountains, except for the McClure Tunnel (53-0008), which is a cut-and-cover structure. They range in length from 243 feet (Baldy Road #2, 53C0503) to 1,850 feet, or about 1/3 of a mile (Broadway, 34C0006). However, none of these tunnels are significant for their length, as there are several longer tunnels in California which have previously been evaluated, such as the Caldecott Tunnels in Oakland, which are nearly twice as long as the Broadway Tunnel.

This report concludes that five of the evaluated tunnels are eligible for listing in the National Register of Historic Places. The Waldo tunnels (27-0040L and R) and the Dornan Drive Tunnel (28C0318) meet National Register Criterion A, as significant improvements in transportation and as catalysts for development in the San Francisco Bay Area. The Waldo tunnels also meet National Register Criterion C as significant achievements in civil engineering and construction. The Gaviota Gorge and Sepulveda tunnels (51-0172R and 53C0164) meet National Register Criterion C for the distinctive design of their portals.

The nine remaining tunnels are ineligible for National Register listing. Of these, the Third Street Tunnel (53C1339) was significant in the development of downtown Los Angeles but has been so extensively altered that it no longer

possesses sufficient integrity for National Register listing. The other tunnels do not have significant associations with local transportation improvements or development, were not significant achievements in civil engineering or construction, and are not aesthetically distinctive.

## VI. Conclusions

The following tunnels are eligible for listing in the National Register of Historic Places, and are considered to be historical resources for the purpose of compliance with CEQA:

- 27-0040L Waldo (Hwy. 101), SB Sausalito, Marin County
- 27-0040R Waldo (Hwy. 101), NB Sausalito, Marin County
- 28C0318 Dornan Drive Richmond, Contra Costa County
- 51-0172R Gaviota Gorge (Hwy. 101) Santa Barbara County
- 53C0164 Sepulveda Blvd. Los Angeles, L.A. County

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#### Personal Communication

Mike McAlister, Angeles National Forest Archaeologist. November 15, 2005.

Virginia Rigny, Point Richmond Neighborhood Council. February 2, 2004.

#### Maps

USGS Quadrangle Maps, 7.5 minute series, various.

## **Appendix A**

### **Inventory and Evaluation (DPR-523) Forms for tunnels that are eligible for National Register listing**

27-0040L and R	Waldo Tunnels, Highway 101, Marin County
28C0318	Dornan Drive, Richmond, Contra Costa County
51-0172R	Gaviota Gorge, Highway 101, Santa Barbara County
53C0164	Sepulveda Blvd., Los Angeles

## **Appendix B**

### **Inventory and Evaluation (DPR-523) Forms for tunnels that are ineligible for National Register listing**

19C0169	State Route 193, Newcastle, Placer County
34C0006	Broadway, San Francisco City and County
53-0008	McClure Tunnel (State Route 1), Santa Monica, Los Angeles County
53C0251	Baldy Road #1, Los Angeles County
53C0489	Soledad Canyon Road, Los Angeles County
53C0503	Baldy Road #2, Los Angeles County
53C0601	Angeles Forest Highway, Los Angeles County
53C0621	Malibu Canyon Road, Los Angeles County
53C1339	Third Street, Los Angeles City and County