Chapter 1 Proposed Project

1.1 Introduction

The California Department of Transportation (Caltrans) and the Federal Highway Administration (FHWA) propose to replace the Lake Britton Bridge #6-0052 and construct 2.7 miles of new highway to conform State Route 89 (SR89) to the new bridge alignment and grade. These improvements would upgrade the existing two-lane highway to meet current highway design standards. Once the new bridge and highway are constructed, the old highway alignment will be relinquished. The existing bridge will be removed. This project is located on SR89 in Shasta County, about 10 miles north of Burney, between post miles 26.3 and 30.7. The alignment of the existing highway imposes driving restrictions such as limited sight distance and difficulties in negotiating sharp curves and steep grades. The proposed improvements include curve alignment modifications. Figures 1-1 and 1-2 show project vicinity and location maps.

This project is included in the Fiscal Year 2005/2006 Federal Statewide Transportation Improvement Program (FSTIP) and is proposed for funding from the State Highway Operation Protection Program (SHOPP). It is also included in the Metropolitan Transportation Commission's (MTC) 2004 Regional Transportation Plan (RTP).

1.2 Purpose and Need

The purpose of the project is to meet current highway design standards on SR89 and provide a safer transportation facility for the traveling public. The project is needed to protect SR89 continuity and allow permit load traffic across Lake Britton, where the existing bridge is a deficient riveted steel deck truss structure built in 1938 that has reached the end of its service life and has chronic fatigue failures in the floor beam connections. Permit load traffic is prohibited due to the nonstandard width and structural deficiency of the existing bridge. This problem cannot be reasonably addressed without replacing the structure.

In addition to the deficient bridge, the project addresses several other nonstandard features. Motorists encounter less than standard sight distance, changes in speed between curves, and increased possibility of skidding, especially during the winter

months. A portion of the roadway south of the bridge is shaded by embankment cut, which delays snow and ice melt and exhibits rock fall issues. The railroad underpass north of the Lake Britton Bridge has nonstandard horizontal and vertical clearances. The accident rate for this segment of SR89 is 3.26 times higher than the statewide average.

Retrofitting the existing 1938 structure was considered but rejected as a feasible alternative due to the age and style of the bridge. This project is compatible with planned future improvements to SR89, which is designated as a Scenic Byway and an All-American Road, and is recommended as a Focus Route in the District 2 State Route 89 Transportation Concept Report (2002).

1.2.1 Purpose

The purpose of the project is to improve safety and operations on SR89 in the project area. The specific objectives of the proposed action are to

- Ensure continuous traffic flow on the regional transportation system by replacing a deficient bridge structure.
- Raise the bridge grade to travel above the railroad tracks to allow passage of permitted trucks.
- Realign the highway to match the alignment of the new bridge and improve nonstandard highway features (e.g., short radius curves, vertical and horizontal curve sight distances, superelevation transitions, shoulder widths, compound curves, design speed changes between successive curves, minimum length vertical curves, and nonstandard vertical and horizontal clearance underneath the railroad underpass).
- Construct a new bridge and roadway to be consistent with current highway design standards and state and local transportation plans and programs.

1.2.2 Need

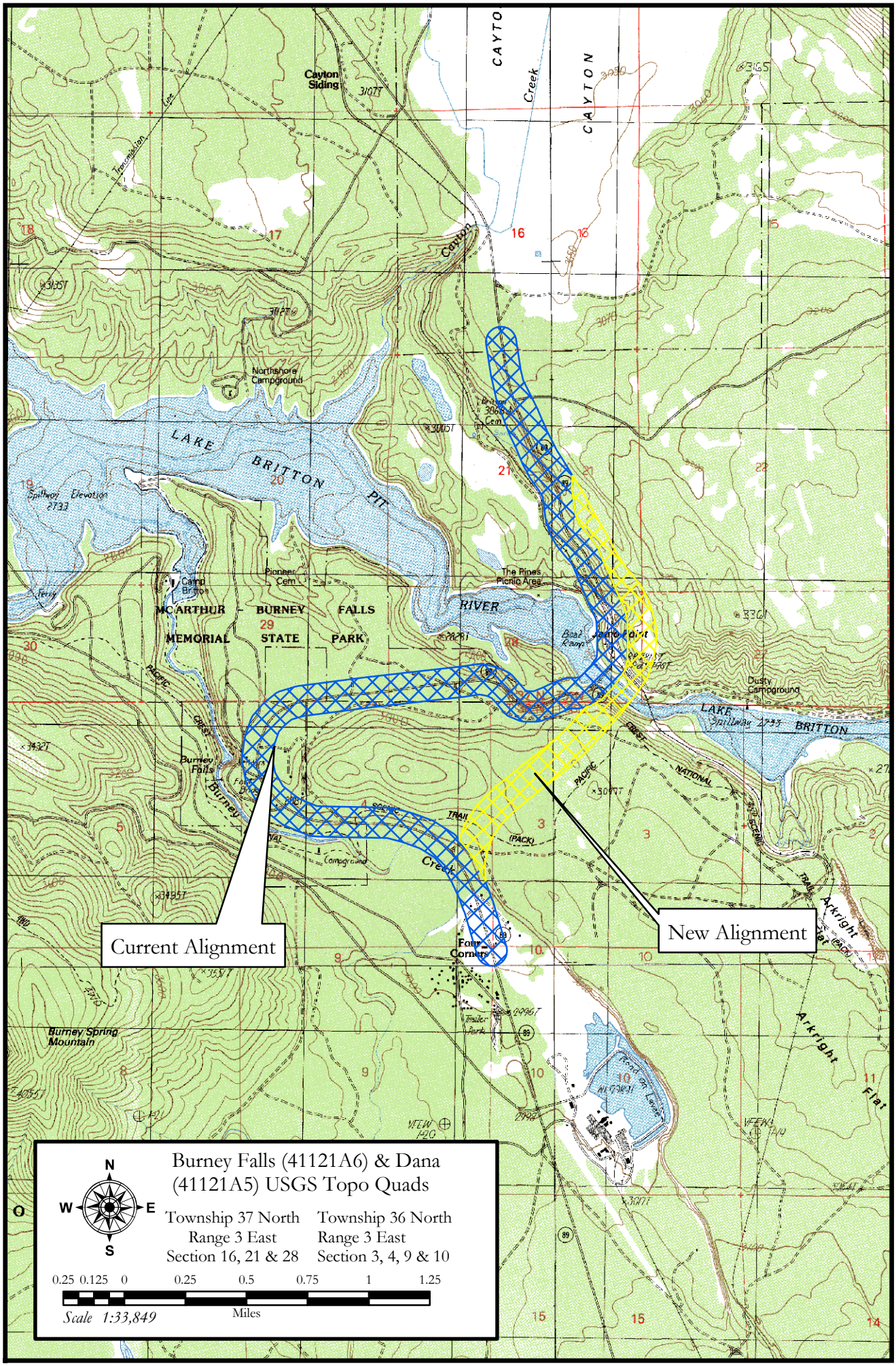
The project is needed to protect SR89 as a vital linkage route. It is the detour route during closures of Interstate 5 (I-5) in the Sacramento River Canyon. SR89 connects I-5 and SR36, SR44, SR70 and SR299; I-5 and U.S.395; and links interstate traffic in Oregon, Nevada and California.

The project was initiated due to a deficient bridge structure that has reached the end of its service life. Permit load traffic is prohibited. Structure Maintenance and

Figure 1-1 Project Vicinity Map

Caltrans	State of California Department of Transportation	Proposed Lake Britton Bridge Replacement Project
	SHA-89 PM 26.3/30.7 EA 02-32560	On State Route 89 in Shasta County, approximately 10 miles north of Burney

Figure 1-2 Project Location Map



Investigation Reports revealed the need to replace the existing bridge, stating that permit load deficiency cannot otherwise be reasonably addressed. The project is needed to address the following transportation problems and conditions:

- Standardize bridge width, between bridge rails, from existing 24 feet to 40 feet
- Improve vertical and lateral clearances. The existing railroad underpass has a nonstandard vertical clearance of 14.3 feet. The new bridge will span above the railroad tracks, eliminating this deficiency, and exceed vertical and horizontal standard clearances.
- Lift restrictions on permit load traffic.
- Improve safety. The accident rate on this segment of SR89 is 3.26 times higher than the statewide average.
- Preserve access to numerous small communities in northeastern California, as well as to major recreational attractions and resource areas in the local and regional area.
- Maintain SR89 as an emergency detour for all transportation modes when I-5 between Redding and Mt. Shasta is closed.
- Recognize that SR89 in the project area is designated as a Scenic Byway and an All-American Road. Use designated route criteria to guide SR89 improvements.

1.3 Alternatives

The project has one build alternative (Alternative 1) and the No-Build Alternative. A multi-disciplinary team developed a range of alternatives to achieve the project purpose and need while avoiding or minimizing environmental impacts. Only Alternative 1, of all the developed alternatives, avoids resources such as wetlands, Section 4(f) properties, cultural sites, and visual impacts. See Section 1.3.3 for a description of rejected alternatives. Further discussion on wetlands, cultural resources, visual resources, and Section 4(f) properties can be found in Chapter 2 and Appendix B.

The project is located in Shasta County on SR89, about 10 miles north of Burney, from PM 26.3 near Clark Creek Road south of Lake Britton, to PM 30.7 near Soldier Mountain Lookout Road north of the lake. Within the limits of the proposed project, SR89 is a conventional two lane undivided highway without shoulders. The purpose of the project is to upgrade the highway to meet current design standards—including replacing a deficient bridge and partially realigning the highway—to improve safety

and correct operational problems incurred as a result of limited sight distance and difficulties in negotiating sharp curves and steep grades. The project area is located at an elevation of approximately 3,000 feet, and is subject to periodic rain and snow.

1.3.1 Build Alternative

The major project features of the proposed build alternative include replacing the Lake Britton Bridge with a 40-ft-wide structure that meets current highway design standards and realigning the road approaches to the bridge to match the new structure alignment and grade. The replacement bridge would be 203 feet higher than the existing Lake Britton Bridge. This alternative bypasses the McArthur-Burney Falls Memorial State Park, connecting to the State Park on a new road connection, and passes through National Forest System lands, Pacific Gas and Electric property, and some private property. The new bridge is designed to pass over the railroad tracks. The new alignment adds 8-foot shoulders and increases sight distance by improving nonstandard curves and superelevation transitions. Road connections to the Dusty Point Campground, Pines Picnic/Jamo Point Boat Ramp and private residences would be upgraded to improve safety and match the new highway improvements. Overhead and underground utility lines would be relocated. Other project features include work off the paved roadway, excavation and paving operations, drainage improvements, temporary access roads, tree and vegetation removal, and right of way acquisition. The Hat Creek Construction Company property on SR89 (PM 25.5) is designated for disposal of excess excavation.

1.3.1.1 Bridge Construction

The Alternative 1 bridge would be constructed about 500 feet east of the existing bridge. It would have three concrete piers and would connect to a new highway alignment at the south and north ends. The new bridge would be a cast-in-place pre-stressed concrete structure that would have *no piers in the lake*; by comparison, the existing bridge has two piers in the lake.

Construction of the proposed bridge would generally be as follows:

- *Holes (approximately 150 ft deep) will be drilled in the ground at the pier locations (out of the water).*
- *Steel-reinforced concrete will be poured into these holes to create pier footings of about 60 square feet.*
- *Large column forms (wood or steel) will be lifted into place by cranes, placed on top of the footings, and filled with reinforced concrete to create the actual*

bridge pier column. Cranes can be either barge mounted or shore based or both, depending on conditions.

- *After the piers are complete, a crane will install equipment on top of the pier column that will allow all superstructure (i.e., deck) construction to be installed using a balanced-cantilever process. This work will be completely isolated from the water and, more important, eliminate the need for an enormous amount (and size) of steel pile for creating concrete forms used in most standard bridge construction.*
- *After the piers and deck are completed, all temporary steel and sheet piles will be removed from the lake.*
- *No blasting will be required.*

There would be three piers for the new bridge but only two (piers 2 and 3) would be in close proximity to the lake. Piers 2 and 3 would be placed on the south and north bank but would be out of the water. Due to the steepness of the south bank/abutment area, construction will require access to this pier location from the lake. This lake access would be implemented via a floating barge and from a steel pile trestle driven (temporarily) into the lake for staging of equipment and materials. Sheet pile would be installed to create a temporary dock/barge landing along the south bank.

The barge would access the lake and be supplied with materials and equipment from the existing Jamo Boat Launch and from a temporary barge landing area on the north shoreline directly under the new bridge. Sheet pile would be temporarily installed at each barge launch area to create a barge dock. The docks would be required for transfer of materials to barges at approximately the same elevation.

The “H” piles used for the work trestle and the “sheet” piles used for the landing would be the smallest size of “driven” pile that can accomplish the task. Even though the bridge itself will be very large, the design only requires the use of a small amount of temporary pile for construction. Normally, a large bridge like this would require an extensive amount of large steel pile, not only for a work trestle, but also for creating “forms” to pour concrete. All percussive pile driving in water and at piers 2 and 3 will occur within an aquatic sound-attenuation-system, commonly referred to as a “bubble-curtain.” Very large cranes would be used in the construction of the piers. Cranes would operate from the barge, from the temporary work trestle, and possibly from the bank itself.

1.3.1.2 Bridge Demolition

The existing bridge consists of two concrete piers in the lake with a steel superstructure and a concrete deck. Demolition would occur as follows:

- *The concrete deck would be cut up and removed from the deck itself. A large hoe-ram may be used to break up the concrete deck. A hoe-ram is a large "jack-hammer" mounted on an excavator or backhoe.*
- *The steel superstructure would be cut up and removed. This likely would occur from a barge-mounted crane.*
- *The two concrete piers likely would be demolished using a hoe-ram.*
- *No bridge material would be allowed to fall into the lake during demolition. A barge platform or other containment structure will be in place below the work area to prevent bridge debris from entering the lake.*
- *Any incidental material falling into the lake from the pier demolition would be removed.*
- *The existing piers would be removed to a depth below the lake bottom.*
- *No blasting will be required.*

1.3.2 No-Build Alternative

The no-build alternative perpetuates existing nonstandard conditions. This includes maintenance of a segment of highway with bridge and underpass structures that have nonstandard weight, height, and width. Vehicle use restrictions will continue because of the nonstandard allowances. Maintenance services to the existing highway facility will continue at increasing annual costs. SR89 will continue to pass the state park entrance on the curved "loop" alignment. Traffic safety on SR89 will continue to deteriorate as traffic volumes increase.

Figure 1 Truck accident clean-up at Lake Britton Bridge

1.3.3 Alternatives Considered and Withdrawn

Alternative 2. This alternative followed the existing highway alignment more closely than Alternative 1. Similar to Alternative 1, it included construction of a new bridge across Lake Britton, raising the highway grade above the railroad tracks, improving a curvilinear alignment at the south end of the bridge, adding 8-ft shoulders to conform with improvements to the north and south, and relocating some underground utilities. It required cutting trees in front of the State Park to provide a clear recovery zone (CRZ), and constructing a retaining wall at the south end of the new bridge. It was rejected for potential Section 4(f) impacts and potential impacts to cultural resources along the existing nonstandard alignment adjacent to the State Park. (See Appendix B for specific information regarding Section 4(f).)

Alternative 3. Similar to Alternatives 1 and 2, Alternative 3 included construction of a new bridge across Lake Britton and raised the highway grade above the railroad tracks. It reconstructed the segment of highway from 1 mile south to 0.4 mile north of the bridge on new alignment, leaving two gaps along SR89 without shoulders (only the reconstructed segment of highway would have 8-ft shoulders). It required a retaining wall near the bridge site, and substantial cut sections in the hill north of the bridge for shoulder widening. It failed to rehabilitate the existing nonstandard highway south of the bridge. It would not comply with the District 2 State Route 89 Transportation Concept Report (2002). This alternative was rejected for not meeting the purpose and need of the project, potential Section 4(f) impacts, and potential impacts to cultural resources along the existing nonstandard alignment adjacent to the State Park.

Alternative 4. In 2005, the McCloud Railway Company announced plans to abandon its freight operations. With abandonment of the tracks, Caltrans could develop an alternative that did not raise the highway grade above the railroad tracks. This new alternative lowered the bridge grade and realigned the roadway back toward the State Park, partially crossing State Park land. Because of potential Section 4(f) impacts that do not exist with Alternative 1, FHWA cautioned about continuing with this alternative. In addition, removal of the tracks is uncertain. It is viable that a buyer could come forward and resume operations. This alternative was rejected for potential Section 4(f) impacts, and for not meeting the project purpose and need to realign the highway over the railroad underpass to allow passage of permitted traffic.

1.4 Permits and Approvals Needed

The following permits, reviews, and approvals would be required for project construction:

Agency	Permit/Approval	Status
United States Fish and Wildlife Service	Section 7 Consultation for Threatened and Endangered Species. ..Review and Comment on 404 Permit	Section 7, Concurrence Letter issued on 12/2/05.
United States Army Corps of Engineers	Section 404 Permit for filling or dredging waters of the United States.	Application for Section 404 permit anticipated after final ED distribution.
California Department of Fish and Game	1602 Agreement for Streambed Alteration. ..Section 2080.1 Agreement for Threatened and Endangered Species. ..Approval to draft water.	Application for 1602 permit anticipated after final ED distribution. ..Section 2080.1 agreement anticipated after final ED distribution.
California Water Resources Control Board	Water Discharge Permit.	Application for Section 401 permit anticipated after final ED distribution.
United States Forest Service—Lassen National Forest	Compliance with Special Use Permit. ..Compliance with Fire Plan ..Agreement to abandon roadway. ..Letter of Concurrence to realign Pacific Crest Trail on Forest property	Application for permit anticipated through Caltrans' Right of Way after final ED distribution. ..Fire Plan specifications will be incorporated into Caltrans' Plans and Specifications. ..Approval anticipated after final ED distribution. ..Approval anticipated through Caltrans' Right of Way.
McArthur-Burney Falls Memorial State Park	Agreement to abandon roadway.	Approval anticipated after final ED distribution.
Pacific Gas & Electric Company	Approval to draft water. ..Approval to use Jamo Point Boat Ramp/Barge Site during construction. ..Agreement to abandon roadway.	Approval anticipated after final ED distribution.
McCloud Railway	Approval to construct over tracks.	Approval anticipated through Caltrans' Right of Way.
California Department of Boating and Waterways	Compliance with U.S. Coast Guard and boating regulations. ..Periodic closures to boaters underneath bridge construction site.	Approval anticipated after final ED distribution.

Interagency coordination with the USDA-Lassen National Forest has been an integral part of project development. To ensure compliance with NEPA and USFS policy, Caltrans continues to consult and coordinate with Lassen Forest under the direction of the Federal Highway Administration.