



Mosquito Road Bridge Replacement Project

Public Workshop, Saturday, January 26, 2013

Mosquito Fire Protection District Station 75

PRESENTED BY:

County of El Dorado
Community Development Agency
Transportation Division

Matthew Smeltzer, P.E.
Deputy Director of Engineering

Adam Bane, P.E.
Senior Civil Engineer

Janet Postlewait
Principal Planner

Anne Novotny
Senior Planner





Workshop Agenda

- 1. Welcome & Introduction – Anne Novotny**
- 2. Bridge Facts / Current Conditions – Matt Smeltzer**
- 3. Highway Bridge Program Funding – Matt Smeltzer**
- 4. Study Update / 1993 Alternatives – Adam Bane**
- 5. Bridge Design Examples – Matt Smeltzer**
- 6. Project Delivery Process / Schedule – Anne Novotny**
- 7. Next Steps for Public Input – Anne Novotny**
- 8. Open Question & Discussion Period**



Mosquito Bridge Facts



Mt. Democrat 4/2/98 article by Peg Presba

- Built in 1939, bridge is 74 years old
- 9-ft wide one-lane timber suspension bridge
- 140-ft long span over South Fork Amer. River
- 1,300 Vehicles/Day (5-yr avg 2007-11)
- 1 of 77 bridges maintained by DOT



Existing Caltrans Sufficiency Issues

- Inspected every 2 Years by Caltrans; Rated on 140 elements; Score of 0 to 100
- Sufficiency Rating (SR) < 50 = eligible for replacement
- 0.00 SR in 2006; 12.5 SR in 2011 (after 2010 major rehab)
- Structurally Deficient (per 2011 SR)
- Functionally Obsolete (per Deck Geometry rating of 2; less than 3 is “FO”)
- 9-ft width too narrow for emergency response vehicles
- Restricted weight limit (5 tons)



Mosquito Bridge Maintenance

- Average annual maintenance cost: \$45K
- Extensive rehabilitation in 1985, 1990 & 2010
- 2010 Rehab cost: \$367K
- Bridge Closure Periods:
 - 2 weeks, 8a - 3p M-F (open nights/weekends) for annual routine maintenance
 - 2 - 3 months (24-7) for extensive rehab (when warranted per Caltrans inspection reports)
- Only alternate route is Rock Creek Rd to State Hwy 193
- Changeable message signs in Placerville at US50 & Mosquito cutoff road

Mosquito Bridge Major Rehabilitation, Fall 2010



Mosquito Bridge Major Rehabilitation, Fall 2010





Why Replace the Existing Bridge?

- Bridge replacement projects prioritized based on structural integrity, daily use, annual cost to maintain, and accident history
- Meets federal criteria for replacement:
 - Structurally deficient and functionally obsolete
 - Low weight limit and fracture critical
 - High daily use and narrow width
- Lacks standard barriers and railings
- Restricted emergency vehicle access



Highway Bridge Program (HBP)

Federal Funding

- Federal Highway Administration (FHWA) safety funding program for bridge maintenance, rehab and replacement
- 100% Federal Participating Share (No Local Match; County General Fund will NOT be used)
- July 2010 – County submitted HBP request to Caltrans
- April 2011 – County received federal authorization for \$2 million to proceed with Preliminary Engineering
- HBP requires completion of Planning, Environmental, and Preliminary Engineering within 10 years of Preliminary Engineering authorization date



Mosquito Bridge Study Update

1993 Bridge Replacement Study

- Five alternatives evaluated
- Insufficient funding at that time

Intent of Study Update

- Identify any new alternatives for consideration
- Solicit public input on evaluation criteria
- Recommend the preferred alternative

Continual Public Input during Planning Process

- Follow-up public meetings for public input on Study Update and alternative selection



• 1993 Study Evaluation Criteria

- Community Acceptance
- Costs – Bridge Construction, Approach Roadway, Right of Way Acquisitions, Maintenance/Rehab
- Safety
- Vehicle Operations Savings
- Environmental Issues
- Aesthetics
- Emergency Vehicle Access
- Recreational Uses

1993 Study Evaluation Process / Criteria

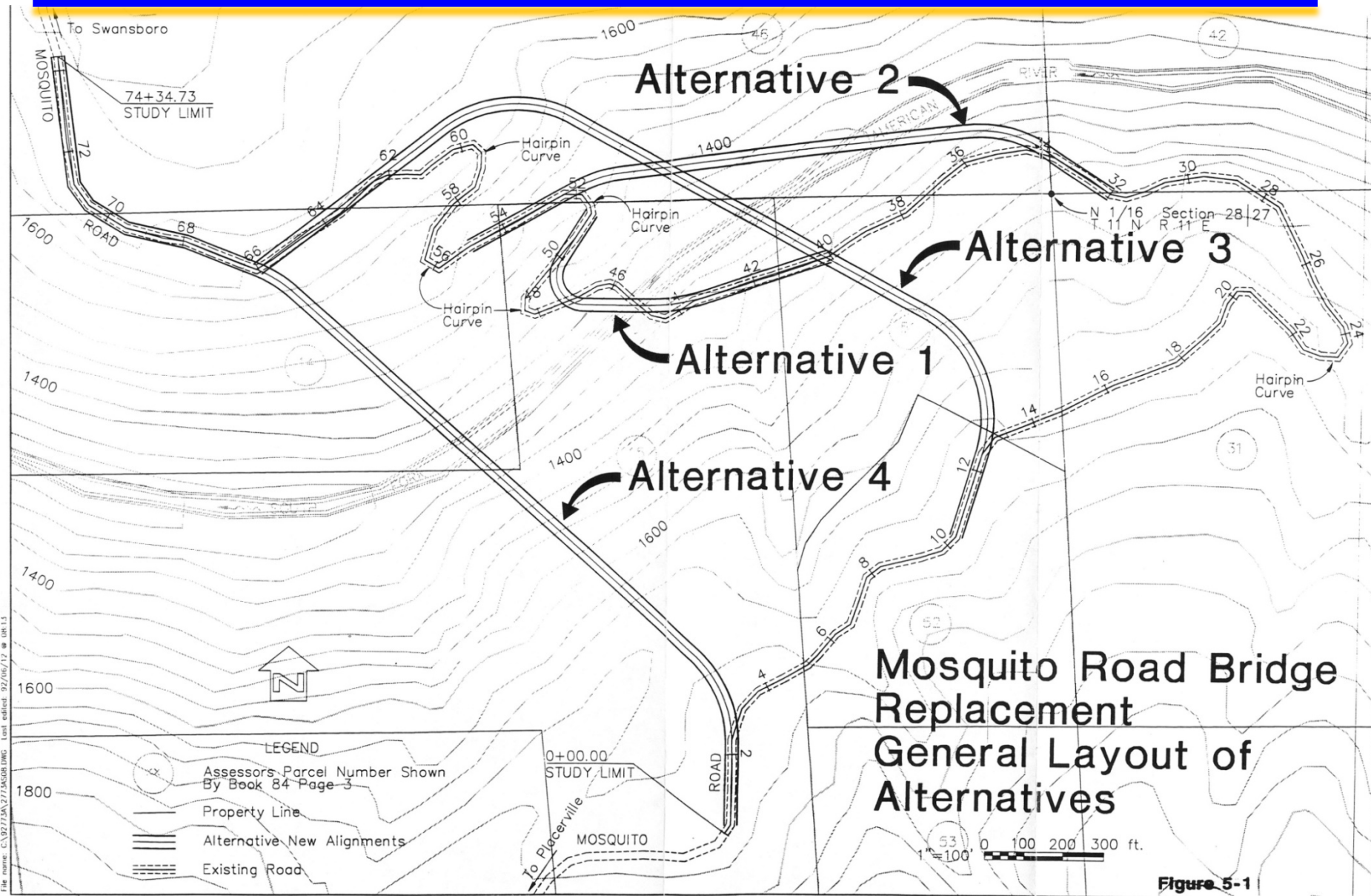
CRITERIA	ALTERNATIVE										
		1		2		3		4		5	
	Importance Factor	Rating	Weighted Score	Rating	Weighted Score	Rating	Weighted Score	Rating	Weighted Score	Rating	Weighted Score
BRIDGE											
(1) INITIAL COST	10	5	50	4	40	1	10	1	10	5	50
(2) MAINTENANCE COST	6	5	30	5	30	3	18	3	18	5	30
(3) AESTHETICS	6	3	18	4	24	4	24	4	24	4	24
ROADWAY											
(4) APPROACH ROAD COST	10	5	50	1	10	3	30	5	50	5	50
(5) MAINTENANCE COST	6	2	12	2	12	4	24	5	30	2	12
(6) REHABILITATION / REPLACEMENT COST	6	1	6	2	12	3	18	5	30	1	6
(7) DEFICIENCIES / SAFETY	9	1	9	2	18	4	36	5	45	1	9
(8) VEHICLE OPERATING SAVINGS	8	1	8	2	16	5	40	5	40	1	8
(9) RIGHT OF WAY COSTS	5	5	25	5	25	2	10	2	10	5	25
(10) ENVIRONMENTAL ISSUES / PERMITTING (STUDY AREA)	5	2	10	4	20	4	20	4	20	2	10
(11) RECREATIONAL USES	4	1	4	3	12	4	16	4	16	1	4
(12) COMMUNITY ACCEPTANCE	9	2	18	3	27	5	45	5	45	1	9
(13) EMERGENCY VEHICLE ACCESS	10	1	10	1	10	5	50	5	50	1	10
(14) IMPACT ON GENERAL PLAN	5	4	20	4	20	4	20	4	20	4	20
TOTAL			270		276		361		408		267

Ratings: 1 = Low; 5 = High

Mosquito Rd Bridge Project
Public Workshop, 1/26/13

TABLE 9-6 - CRITERIA MATRIX

Alternatives Evaluated in 1993 Study



5-2

1993 Alternative 1 Conceptual Drawing

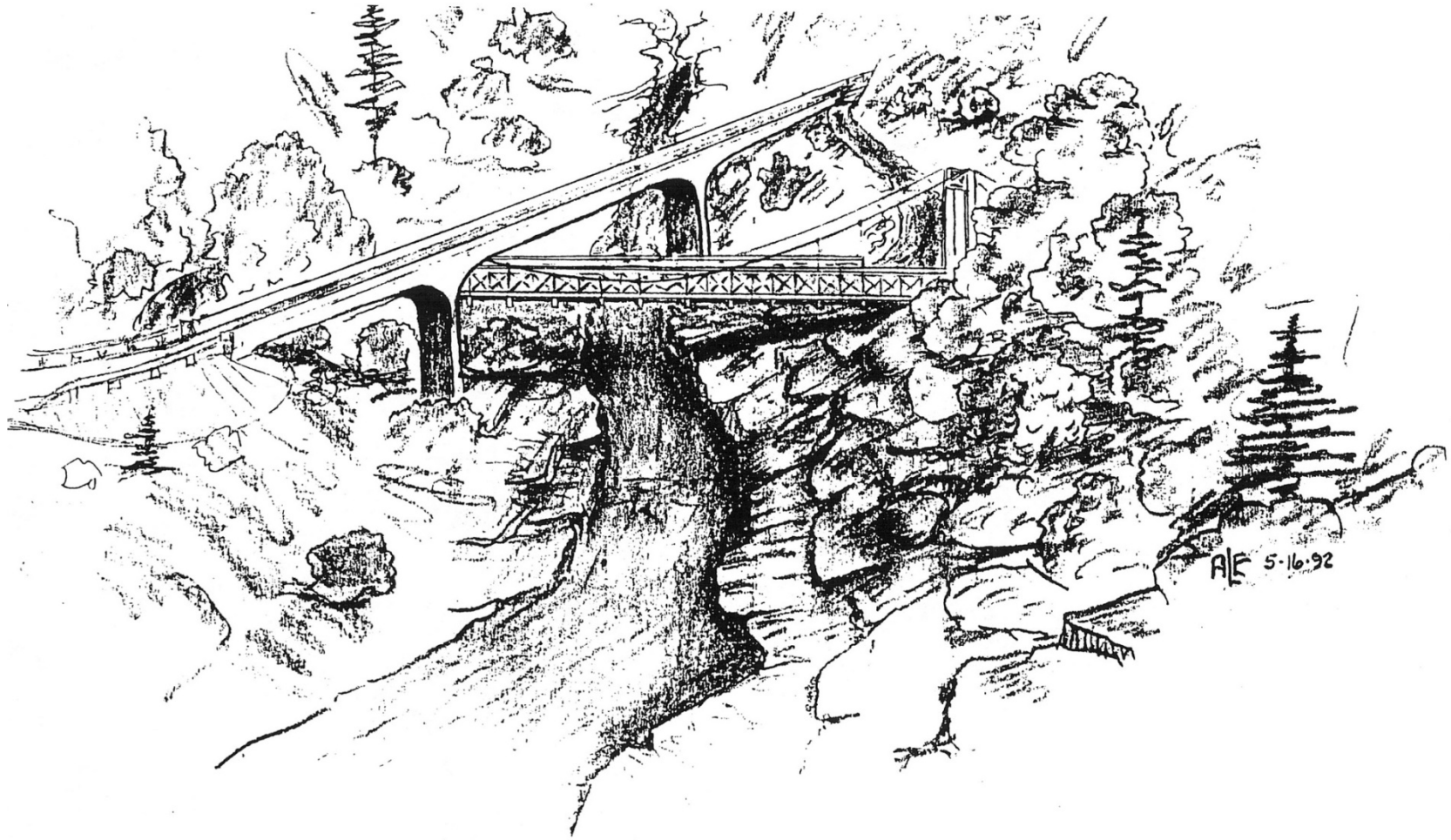


Figure 5-3 Alternative 1 Rendering

1993 Alternative 2 Conceptual Drawing



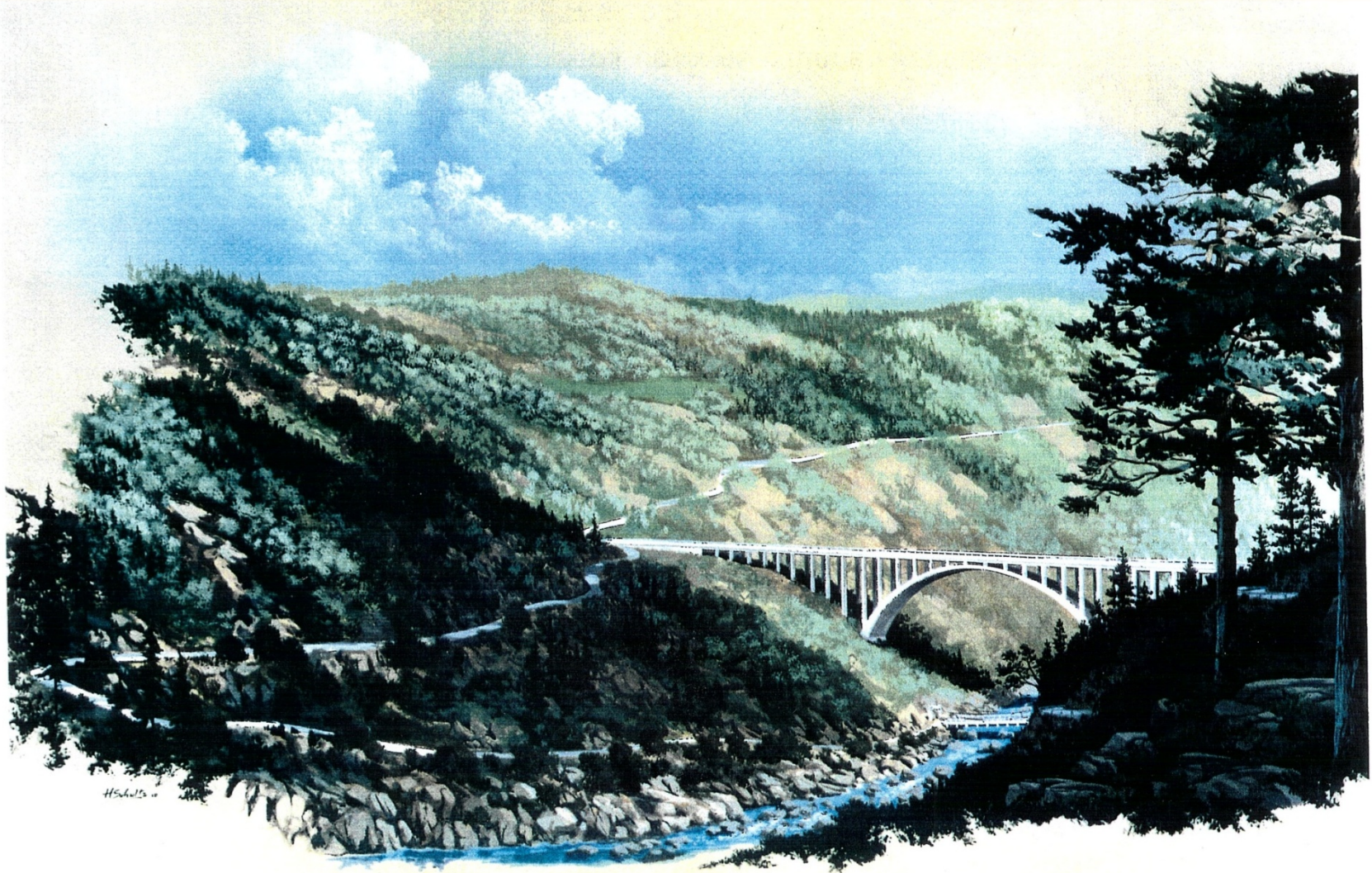
Figure 5-6 Alternative 2 Rendering

1993 Alternative 3 Conceptual Drawing



Figure 5-8 Alternative 3 Rendering

1993 Alternative 4 Conceptual Drawing



1993 Alternative 5 Conceptual Drawing





1993 Alternatives Evaluated

Alt No.	Length (feet)	Feet Above River	Location from existing bridge	Hairpin Turns Eliminated	Proposed Design Concept	Mosquito Rd Open/Closed during Construction
1	542	70	40 feet above	1 (northside)	Prestressed concrete box girder	CLOSED
2	978	110	700 feet upstream	2 (northside)	Prestressed concrete box girder	OPEN
3	1,570	340	350 feet upstream	All (north & south sides)	Cantilevered segmental concrete box girder	OPEN
4	1,700	360	550 feet downstream	All (north & south sides)	Arch	OPEN
5	161	40	10-40 feet downstream	1 (northside)	Prestressed concrete box girder	CLOSED



1993 Alternatives Comparison

Alt No.	Bridge Initial Cost (1993 dollars)	Road Rehab Cost (1993 dollars)	Vehicular Savings	Emergency Vehicle Access	Roadway Deficiencies/ Safety	Other Factors/Conditions
1	\$3.1M	\$1.7M	Least savings to driving public	Little/No improvements (same as Alt 5)	Greatest deficiencies with no safety improvements	Icy Conditions - Vehicles would slide on 12 percent grades
2	\$5.6M	\$1.2M	About 2.5 times greater than Alt 1	No significant improvements	Steep grades – 20% downhill 24% uphill	Icy conditions, steep grades could be hazardous
3	\$16M	\$300K	39 times greater than Alt 1	Significant improvements (same as Alt 4)	About 24% profile grades at abutments	Icy conditions, steep grades could be hazardous
4	\$18M	\$0	Best: 32 times greater than Alt 1	Significant improvements (same as Alt 3)	Required 8-ft shoulders	
5	\$1.5M	\$2.1M	Second least savings to driving public	Little/No improvements (same as Alt 1)	Same as Alt 1	



1993 Study Alternatives Ranking

Alternative	Criteria	Benefit Cost Ratio (1)	Capital Improvement Cost (2)	Ranking w/o Funding (1)	Funding Available (1)	Total
5 Low-Profile	1	1	5	7	5	12
4 High-Profile	5	5	1	11	1	12
3 High-Profile	4	4	2	10	1	11
2 Low-Profile	3	3	3	9	1	10
1 Low-Profile	2	2	4	8	1	9

Note: (1) Highest Value = Highest Ranking
 (2) Highest Value = Least Cost

TABLE 12-1



Bridge Design Examples

Prestressed Concrete Box Girder



Current Chili Bar Bridge over South Fork American River at State Hwy 193, El Dorado County Built in 1993, replaced historic bridge pictured below.



The bridge built in 1922, was designed by John B. Leonard, a pioneering proponent of the use of reinforced concrete in California. He designed many of the earliest reinforced concrete arch bridges in the state.



Bridge Design Examples

Concrete Box Girder Design **Lake Natoma Crossing, Folsom**

Post-tensioned concrete box girder, with false deck arches; 4 traffic lanes; opened in 1999; designed to mimic key features of the original Rainbow bridge; includes pedestrian walkways with outlook areas, decorative vintage looking railing and lights.



Concrete Arch Design **Rainbow Bridge, Folsom**



208' long main concrete arch span with open spandrel columns and 7 span north and 4 span south T-girder approaches totaling 511' in length. Built in 1917, underwent major reconstruction in 1969. Was the only means of crossing the American River in the City of Folsom until 1999 when the Lake Natomas Crossing was completed.



Bridge Design Examples

Cast In Place Prestressed Concrete Box Girder



Most commonly constructed bridge type in California; can be designed with arched curvature for increased aesthetics; segmental construction can be used for long spans where falsework is impractical.



Bridge Design Examples

Suspension Cable



Guy A. West Memorial Bridge, Sacramento

Spans the American River between Sacramento State University and Campus Commons. Built in 1966, the pedestrian bridge is 1,144-ft long and 16-ft wide.

Cable stayed ridge over the River Labe at Nymburk, Czech Republic



First cable-stayed bridge in the Czech Republic with two planes of stays and low pylons, characteristic of an extradosed type of cable stayed bridge.



Truss Bridge Design Examples

Hwy 50/Bull Creek Rd



Photo courtesy of: Ron Speake, Mosquito resident



With more than 15,000 installations throughout the U.S. since 1936, U.S. Bridge offers a wide range of custom designed, prefabricated steel vehicular truss bridges.



Project Delivery Process

- **Public Input** – collect public comment and establish evaluation criteria based on community priorities
- **Draft Study** – perform preliminary assessment
- **Present Draft Study Update** – to public for review and comments
- **Finalize Draft Study**
- **Environmental Review** – includes additional public input and ultimate certification and project approval by the Board of Supervisors
- **Design Engineering, Right-of-Way** (acquiring necessary land rights), **Construction**



Anticipated Project Schedule

Phase	Duration	Years
Planning/Environmental	2 yrs	2013-15
Prelim Engineering/Design	18-24 mos.	2015-16
Right-of-Way/Permitting	1 yr	2017
Construction	2 yrs	2018-19
Project Completion by		2020



Next Steps for Public Input

- **Q & A Session** – *What are your important issues?*
- **Evaluation Criteria** – *What are your priorities?*
- **Comment Cards** – please fill one out
- **Sign-In Sheet** – provide your email address to receive project updates
- **Visit the Project Website at:**
www.edcgov.us/bridgeprojects/
- **Follow-up Public Workshop** – later this year

Your input is important to us.



Questions or Comments

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Placerville, CA 95667

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***Thank you for attending this workshop.
Your input is important to us.***