



**El Dorado County
Department of Transportation**

*Planning Level Cost Study for
US 50 Interchange Improvements*

FINAL MEMORANDUM

Prepared By



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ATTACHMENTS

- Cost Estimate Summary Worksheets
- Technical Memorandum (Fehr & Peers)
- Interchange Improvement Conceptual Plans



I. INTRODUCTION

The El Dorado County Department of Transportation contracted with the Roseville office of URS Corporation to prepare preliminary concepts for future improvements to four interchanges on US 50 in western El Dorado County and estimate planning level costs for those improvements.

The purpose of these studies is to provide preliminary planning and costs to serve as input for Traffic Impact Fees to be assessed by the County and for input to SACOG for the MTP update. The studies did not address auxiliary lanes between interchanges that are likely to be needed between Bass Lake Road on the west to Ponderosa Drive on the east. The four interchanges studied are:

- Bass Lake Road (A Type L-1 Compact Diamond)
- Cambridge Drive (A Type L7-L9 Combination Spread Diamond and Partial Cloverleaf)
- Cameron Park Road (A Type L-1/L-9 Combination Compact Diamond and Partial Cloverleaf)
- Ponderosa Drive (A Type Type L-7/L-9 Combination Spread Diamond and Partial Cloverleaf)

The interchanges and adjacent frontage roads were constructed by the State of California Department of Transportation (Caltrans) approximately 40 years ago. Traffic volumes have increased with the growth of the associated communities and will continue to increase rapidly in the future.

II. TRAFFIC ANALYSIS

Fehr and Peers conducted preliminary traffic studies of two scenarios for the 2025 design year. The scenarios differ based on the assumptions in, and adoption of, the County's General Plan. The basis and results are contained in the attached Technical Memorandum dated January 17, 2005.

III. PROJECT IMPROVEMENTS

Based on the conclusions of the traffic analysis, the four interchanges will likely need to be improved as described below. These improvements and their costs are very preliminary and should be analyzed and developed further in a formal Caltrans planning process, such as in a Project Study Report. Proposed improvements are shown on the attached plans and summarized as follows:

A. Bass Lake Road

Bass Lake Road Interchange is a Type L-1 compact diamond. There is no existing development adjacent to any quadrant of this interchange. The interchange primarily serves as access for residents to the north and east. Lesser volumes of traffic originate from the south.

Bass Lake Road has one lane in each direction with no turn pockets. The improvement concept proposes widening to provide a southbound left turn pocket and two northbound lanes with a northbound left turn pocket. The two northbound lanes will carry through the Country Club intersection. Southbound lanes from the north will be widened to provide a left turn pocket at Country Club, and a right turn onto the westbound on ramp.



On-ramps are proposed to be widened to provide HOV lanes and are to be metered. In addition, one mixed flow lane is proposed to be added at the westbound on ramp. Off-ramps will also be widened to provide two exit lanes. All three stop controlled intersections will be signalized.

Structure

The pier support locations of the existing 3-span undercrossing structure will not allow for any widening of the roadway. It is assumed the bridge would be replaced and that staged construction can be developed to maintain reasonable mainline (US 50) traffic flow. This may be accomplished by first constructing a 2-lane detour bridge in the median between the two existing structures and shifting traffic when the existing structures are demolished and replaced one at a time. The new structure is envisioned to be a single span.

B. Cambridge Drive

Cambridge Drive Interchange is a Type L-7/L-9 combination spread diamond and partial cloverleaf. It is constrained by retail and commercial development adjacent to the NW and SE quadrants. The SW and NE quadrants are relatively undeveloped. Proposed improvements are shown on the attached plans and summarized as follows:

Cambridge Drive is currently one lane in each direction from Crazy Horse on the south to Country Club on the north. It is proposed to be widened to two through lanes in each direction with left turn pockets at intersections.

On-ramps would be widened to provide for HOV lanes and are to be metered. A new westbound “slip” on-ramp would be provided. Off-ramps will also be widened to provide two exit lanes. Nearby Merrychase Drive is a heavily used local road that aligns with the westbound off-ramp.

Alternative 1: This alternative assumes that Merrychase Drive would be closed prior to Cambridge Drive, with traffic routed via Knollwood and Cameo Lane. A northbound left turn lane would be provided on Cambridge at Knollwood. This alternative provides a better operational scenario for the majority of through traffic and southbound to westbound freeway traffic.

Alternative 2: This alternative assumes that the Merrychase Drive/Cambridge Drive intersection would remain open. The westbound “slip” on-ramp would be moved to the south, requiring a Design Exception approval by Caltrans.

Structure

The overcrossing structure would be widened from two lanes to four lanes and would be anticipated to require seismic retrofit work.



C. Cameron Park Drive

Cameron Park Drive Interchange is a Type L-1/L-9 combination compact diamond and partial cloverleaf. The area surrounding the interchange is almost completely developed with retail and commercial business in all four quadrants. Proposed improvements are shown on the attached plans and summarized as follows:

Currently, Cameron Park Drive has six lanes through the US 50 undercrossing structure: two through lanes in each direction and dual left turn pockets for southbound to eastbound on-ramp movements. It is proposed to be widened from Coach Lane to accommodate three through lanes in each direction, and a right turn lane for northbound to the eastbound on-ramp traffic. One lane northbound would be a drop lane entrance to the westbound hook on-ramp. Widening would also be planned north of Country Club up to Palmer Drive. As a separate project, additional widening north of Palmer Drive is planned to match the future widening of Cameron Park.

On-ramps are proposed to be widened to provide HOV lanes and are to be metered. Off-ramps would also be widened to provide two exit lanes. Existing intersections are signalized and would be modified to accommodate the widening and improvements.

Structure

The existing single span undercrossing structure is long enough to allow widening of the roadway by one lane. This would require construction of new retaining walls closer to the existing abutments. Structural work should not impact Highway 50, but would temporarily impact traffic flow on Cameron Park Drive.

D. Ponderosa Road

Ponderosa Road Interchange is a Type L-7/L-9 combination spread diamond and partial cloverleaf. It is almost completely developed with retail and commercial business in all four quadrants. Proposed improvements are shown on the attached plans and summarized as follows:

Ponderosa Road has one lane in each direction as it approaches the interchange from both directions. At Motherlode, it widens out to two lanes northbound and merges back to one lane north of North Shingle Road. It will be widened to two through lanes in each direction with left turn pockets and right turn pockets .

The local roads Durock and North Shingle Road will be relocated away from their existing location adjacent to the off-ramps to provide a much greater intersection separation from the ramps.

On-ramps are proposed to be widened to provide HOV lanes and are to be metered. Off-ramps will also be widened to provide two exit lanes. The westbound off-ramp will be relocated to the old North Shingle Roadway location and align with Wild Chapparel Drive.

Structure

The overcrossing structure would be widened from three lanes to four lanes with a median/left turn pocket. It will also require seismic retrofit work.



IV. COST ESTIMATES AND METHODOLOGY

The cost estimates for this study focused on the major components of the anticipated improvements and are shown in 2005 dollars. To the extent possible, the methodology is consistent with the Caltrans procedures for a Project Study Report (Project Development Support). Budget and schedule constraints for this preliminary effort resulted in various limitations of this study due to a lack of detailed information, including:

- ✓ Accurate topographic mapping;
- ✓ Soils information;
- ✓ A Preliminary Environmental Assessment Report (PEAR);
- ✓ Individual Right of Way property valuations; and
- ✓ Utility information.

The source of mapping and assumptive information forming the basis of this report include:

a. Mapping

Base mapping and property lines for each interchange were derived from GIS information on an aerial photo supplied by the County and “rubber sheeted” to provide a scaleable plan view of the interchange and surrounding terrain. Contours were taken from USGS Quad maps (at 10-foot intervals). Contours of individual areas where cuts and fills would be needed for road widening were estimated from field visits.

b. Roadway Construction

The following items have been included in the estimates for roadway costs as representing the majority of construction costs:

1. Typical cross section (assumed complete reconstruction; no overlay of existing)
 - i. 12-foot travel lanes
 - ii. 6-foot bike lane, 2-foot curb/gutter, 5-foot sidewalk.
2. Structural section was assumed to be 8” Asphalt Concrete (AC) on 24” Aggregate Base (AB)
3. Storm drainage: assumed simple modification (relocation) of existing inlets @ \$15/LF of new curb.
4. Ramp meters and HOV lanes for every on-ramp.
5. New signals at key intersections.
6. Street Lighting at 250-foot intervals.
7. Other allowances include additional percentages of the estimated items for:
 - i. **Minor Items:** These items are routine bid items that accompany roadway work and are identified at the planning level cost estimate as a 5% to 10% allowance.



- ii. **Supplemental Costs:** These costs represent work items that are not typically part of the bid schedule, but represent other costs that agencies absorb directly.
- iii. **Mobilization:** Caltrans standard of 10%.
- iv. **Contingencies:** This input represents unidentified work that will be further developed during the later stages of the project. We have used 35%, up from 25% at the PSR level of estimates.

c. Structures Construction

Information for estimating structural modifications, demolitions, and new structures was gathered from “windshield surveys”. As-built drawings were not available and assumptions were made about the materials and construction methods historically used by Caltrans for similar overcrossings and undercrossings. Planning level costs can be summarized as follows:

1. Widening Caltrans bridges of this size, estimated at \$250 per square foot (SF).
2. Seismic retrofit work for existing structure widening projects, estimated at \$20/SF.
3. Tie back retaining walls (at abutments), estimated at \$125/SF.
4. New bridge construction, estimated at \$175/SF.
5. Demolition costs, estimated at \$30-35/SF.

d. Right of Way Costs

R/W takes were assumed to provide a 10-foot buffer behind back of sidewalk or back of curb. Right of way planning costs were supplied by the County at \$600,000/acre (\$13.77/SF) for Residential and \$800,000/acre (\$18.37/SF) for other non-residential property.

Cost Estimate Summary Worksheets

The following pages contain the Planning Level Cost Estimate Summary Sheets for each individual interchange.



Planning Level Cost Estimate

Bass Lake Road/US 50

District-County-Route _____
 KP(PM) _____
 EA _____
 Program Code _____

PROJECT DESCRIPTION:

Limits: From 500 ft south to 1000 ft north of US 50 Mainline

Proposed Improvement (Scope): Interchange Improvements Year 2025

Bass Lake Road Interchange - Undercrossing Widening

SUMMARY OF PROJECT COST ESTIMATE (2005 Unit Prices)

TOTAL ROADWAY ITEMS	<u>\$8,900,000</u>
TOTAL STRUCTURE ITEMS	<u>\$5,000,000</u>
SUBTOTAL CONSTRUCTION COSTS	<u>\$13,900,000</u>
TOTAL RIGHT OF WAY ITEMS	<u>\$500,000</u>
TOTAL PROJECT CAPITAL OUTLAY COSTS	<u>\$14,400,000</u>

File: Bass Lake Plan level est

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Planning Level Cost Estimate

Cambridge Drive/US 50

District-County-Route _____
 KP(PM) _____
 EA _____
 Program Code _____

PROJECT DESCRIPTION:

Limits: From Country Club Drive to Crazy Horse Road (south)

Proposed Improvement (Scope): Interchange Improvements Year 2025

Cambridge Drive Interchange - Overcrossing Widening

SUMMARY OF PROJECT COST ESTIMATE (2005 Unit Prices)

TOTAL ROADWAY ITEMS	<u>\$11,100,000</u>
TOTAL STRUCTURE ITEMS	<u>\$2,000,000</u>
SUBTOTAL CONSTRUCTION COSTS	<u>\$13,100,000</u>
TOTAL RIGHT OF WAY ITEMS	<u>\$800,000</u>
TOTAL PROJECT CAPITAL OUTLAY COSTS	<u>\$13,900,000</u>

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Planning Level Cost Estimate

Cameron Park Drive/US 50

District-County-Route _____
 KP(PM) _____
 EA _____
 Program Code _____

PROJECT DESCRIPTION:

Limits: From 400 ft south to 1500 ft north of US 50 Mainline

Proposed Improvement (Scope): Interchange Improvements Year 2025

Cameron Park Drive Interchange - Undercrossing Widening

SUMMARY OF PROJECT COST ESTIMATE (2005 Unit Prices)

TOTAL ROADWAY ITEMS	<u>\$11,800,000</u>
TOTAL STRUCTURE ITEMS	<u>\$300,000</u>
SUBTOTAL CONSTRUCTION COSTS	<u>\$12,100,000</u>
TOTAL RIGHT OF WAY ITEMS	<u>\$500,000</u>
TOTAL PROJECT CAPITAL OUTLAY COSTS	<u>\$12,600,000</u>



Planning Level Cost Estimate

Ponderosa Road/US 50

District-County-Route _____
 KP(PM) _____
 EA _____
 Program Code _____

PROJECT DESCRIPTION:

Limits: From 1800 ft south to 1300 ft north of US 50 Mainline

Proposed Improvement (Scope): Interchange Improvements Year 2025

Ponderosa Drive Interchange - Overcrossing Widening

SUMMARY OF PROJECT COST ESTIMATE (2005 Unit Prices)

TOTAL ROADWAY ITEMS	<u>\$15,100,000</u>
TOTAL STRUCTURE ITEMS	<u>\$2,300,000</u>
SUBTOTAL CONSTRUCTION COSTS	<u>\$17,400,000</u>
TOTAL RIGHT OF WAY ITEMS	<u>\$3,700,000</u>
TOTAL PROJECT CAPITAL OUTLAY COSTS	<u>\$21,100,000</u>