

Interstate 5 – Union Pacific “Disconnect” Cost-Benefit Analysis Executive Summary

The total project cost of the I-5/Union Pacific Disconnect is \$28.654 million. Although a match is not required for a rural project, the Shasta Regional Transportation Agency (SRTA, and project applicant), the City of Anderson (project co-applicant), the California Department of Transportation (Caltrans), and Shasta County have made funding commitments to the project totaling \$15.9 million—or 55.5% of the total project cost. As seen in Section 3, Grant Funds Request and Sources/Uses of the project narrative, only 44.5% of the project cost remains in desperate need of funding—the \$12.760 million TIGER grant request.

The following matrix summarizes benefits from infrastructure improvements through the project.

Current Status/Baseline & Problem to be Addressed	Change to Baseline/Alternatives	Type of Impacts	Populations Affected by Impacts	Economic Benefits	Summary of Results	Reference in BCA
Current I-5 overcrossings of UP rail line are choke-points for widening I-5 to 3 lanes in each direction	Replace existing bridges with one 6-lane bridge overcrossing	Eliminate travel delay; reduce emissions (no idling); reduce gas use; serve economic development and increased jobs in the vicinity of the project	Long- and short-haul freight; intra- and intercounty commuters; local residents accessing employment, educational and other services;	Value of reduced travel time, emissions, accidents and lost investment potential	Estimated accident rate and dollar value, travel time savings and emission cost savings	BCA Input Sheet and Analysis
Current I-5 overcrossings of UP rail line are dangerously sub-standard and do not meet even minimum UP horizontal and vertical clearances; current clearances do not allow double-tracking	Replacement of existing overcrossings would clearspan the UP R-O-W and provide future double-tracking opportunities	Eliminate travel delay; reduce emissions and fuel use; provide opportunity for increased freight and passenger rail	Long-and short-haul freight; everyday users of interstate and rail line (due to safety); Amtrak; US and non-domestic consumers of products	Value of reduced travel time, emissions and accidents and alleviation of future catastrophic rail/highway event	Estimated accident rate and dollar value, travel time savings and emission cost savings	BCA Input Sheet and Analysis
Current I-5 S/B off-ramp and I-5 N/B on-ramp for Deschutes Road inadequate; both ramps require upgrade for pending Deschutes Road intersection round-about	Project would provide 3-laning needed to upgrade S/B and N/B Deschutes off-and on-ramps, respectively	Decrease accidents; serve economic development and increased jobs in the project vicinity	Freight users due to project adjacent to city of Anderson commercial/industrial acreage; residents and local businesses	Value of reduced accidents and lost investment potential	Estimated accident rate and dollar value, travel time savings and emission cost savings	BCA Input Sheet and Analysis

The California Department of Transportation (Caltrans) compiled a Benefit-Cost Analysis for the I-5/UP “Disconnect” in 2014 with results at both a 3% and 7% discount rate. The project costs

have been prepared using the Caltrans standards for preparing engineering cost estimates for transportation projects. The project traffic operations benefits have been evaluated using modern traffic modeling and operations tools that have been reviewed and approved by Caltrans. Caltrans has upgraded its Benefit-Cost Analysis Model to ensure its consistency with TIGER parameters.

Though the benefit-cost analysis demonstrates multiple benefits that the project would bring, it is important to remember that benefits are understated because the state's benefit-cost model currently has no methodology to factor in "what-if" scenarios related to the interstate bridge supports not meeting safety standards. The analysis created shows only the widening benefits from four- to six-lanes of the Interstate, not the benefit of virtually eliminating the chance of a catastrophic accident involving the I-5 and Union Pacific (UP) mainline corridors. In such a scenario, the I-5 mainline corridor would be useless, leading to huge traffic delays, lost revenue due to reduced/curtailed goods movement, and public safety and local business issues associated with diverted interstate traffic on city streets not designed for such use (See narrative Section 4A.2 for a discussion of impacts). Additionally, the value associated with loss of life, liability, and personal or property injury, cannot be modeled.

Without these somewhat intangibles taken into account, Caltrans Headquarters has estimated that this project will create or support 201 jobs per year and add approximately \$16.8 million per year to the economy (Gross State Product) during construction years. This is based on 18,000 job estimates per \$1 billion dollars invested in highway construction activities and a multiplier of 1.5 in added value to the economy.

In addition to the hazard mitigation of the intersection of the existing UP line and Interstate 5, SRTA and the city of Anderson strongly believe the value-added component of the "Disconnect" project comes from the job creation and economic development it would spur. Replacement of the deficient rail line overcrossing, as well as the new off- and on-ramps for the S/B and N/B Deschutes Road I/C, respectively, would create immediate jobs in the construction industry, enhance goods movement capacity, and remove the only barrier preventing the city from completing the Deschutes Road and I/C improvements (including the addition of a second round-a-bout on the west side of I-5). The TIGER investment in this project, albeit small from the surface, would not only have safety and economic development impacts nation- and state-wide, but would also dramatically increase the job opportunities for the middle class within the city of Anderson and Shasta County.

Finally, the replacement of the bridges over the UP line with one bridge, with 6 travel lanes, clear spanning the UP R-O-W has the following "Fix it First" and "Invest in America: Commit to the Future" implications and benefits:

- Provides an extension of the interstate bridge life by 75 years, at a fraction of the future cost, and with a majority-plus local project match being offered now.
- Reduces congestion for future accidents and/or routine maintenance—reducing travel to one lane on the interstate is not pretty!
- Improves worker safety during routine maintenance or accidents.

BENEFIT/COST ANALYSIS INPUT SHEET - Highway Project

District: County:

Project:

Route:

Post mile:

EA:

PPNO:

PROJECT DATA

Type of Project

Lane Addition	X
HOV Lane Addition	
Passing Lane	
Pavement Rehabilitation	
Other (describe: _____)	

Project Location
(enter 1 for So. Cal., 2 for No. Cal., or 3 for rural)

Length of Construction Period years

Length of Peak Period hours

HIGHWAY ACCIDENT DATA

Actual 3-Year Accident Data (from TASAS Table B)

	Count (No.)
Total Accidents (Tot)	48
Fatal Accidents (Fat)	0
Injury Accidents (Inj)	18
Property Damage Only (PDO) Accidents	30

Statewide Basic Average Accident Rate

Rate Group	No Build	Build
Accident Rate (per mil. veh-mi)	0.69	0.51
Percent Fatal Accidents	0.1%	0.1%
Percent Injury Accidents	31.9%	30.4%
Collision Reduction Factor (if applicable)		

HIGHWAY DESIGN AND TRAFFIC DATA (indicate if 1 or 2 directional)

Highway Design

Roadway Type (Fwy., Exp., Conv. Hwy.)	No Build	Build	HOV Restriction
Number of General Traffic Lanes	Fwy 4	Fwy 6	
Number of HOV Lanes	0	0	
Highway Free-Flow Speed (in mph)	70	70	(2 or 3)
Project Length (in miles)	1.1	1.1	
Pavement IRI (in inches/mile), if pav. project	-	-	

Average Daily Traffic

	No Build	Build
Current	48,000	
Forecast (20 years after construction)	89,000	89,000
Average Hourly HOV Traffic (if HOV lanes)		
Percent Trucks (include RVs, if applicable)	12%	12%
Truck Speed (in mph, if passing lane project)	55	

Replace structure on a new alignment with a new structure to accommodate 6 lanes of traffic on I-5. SR 273 runs parallel to this section of I-5 in Shasta County, in the City of Anderson. The project will connect to a 6-lane section of freeway to the south and to a 4 lane section of freeway to the north.

COMMENTS:

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PROJECT COSTS

Enter the net costs of the project in today's dollars (\$ thousands)

Project Support Costs	\$	4,644,000
Right-of-Way Costs	\$	1,200,000
Construction Costs	\$	7,446,667 Year 1 7,446,667 Year 2 7,446,666 Year 3 Year 4
Mitigation/Other Costs		
Expected Annual Maintenance/Operations Costs		
Rehabilitation Costs		Year:

District:

2

PROJECT:

05-SHA-Bridge w/ Lane Addition_ PM R3.7-R5.8 (3% discount rate)

EA:

4c404

PPNO:

3445B

3

INVESTMENT ANALYSIS SUMMARY RESULTS

Life-Cycle Costs (mil. \$)	\$27.5
Life-Cycle Benefits (mil. \$)	\$5.8
Net Present Value (mil. \$)	-\$21.7
Benefit / Cost Ratio:	0.2
Rate of Return on Investment:	#DIV/0!
Payback Period:	20+ years

ITEMIZED BENEFITS (mil. \$)	Average Annual	Total Over 20 Years
Travel Time Savings	\$0.0	\$0.4
Veh. Op. Cost Savings	-\$0.0	-\$0.3
Accident Cost Savings	\$0.3	\$5.8
Emission Cost Savings	-\$0.0	-\$0.0
TOTAL BENEFITS	\$0.3	\$5.8
Person-Hours of Time Saved	2,388	47,750
CO ₂ Emissions Saved (tons)	-59	-1,186
CO ₂ Emissions Saved (mil. \$)	-\$0.0	-\$0.0

Should benefit-cost results include:

- 1) Induced Travel? (y/n)

Y
Default = Y
- 2) Vehicle Operating Costs? (y/n)

Y
Default = Y
- 3) Accident Costs? (y/n)

Y
Default = Y
- 4) Vehicle Emissions? (y/n)
includes value for CO₂e

Y
Default = Y

District:

2

PROJECT:

05-SHA-Replace Bridge w/ lane add_ PM R3.7-R5.8 (7% discount rate)

EA:

4C404

PPNO:

3445B

3

INVESTMENT ANALYSIS

SUMMARY RESULTS

Life-Cycle Costs (mil. \$)	\$26.8
Life-Cycle Benefits (mil. \$)	\$3.7
Net Present Value (mil. \$)	-\$23.1
Benefit / Cost Ratio:	0.1
Rate of Return on Investment:	#DIV/0!
Payback Period:	20+ years

ITEMIZED BENEFITS (mil. \$)	Average Annual	Total Over 20 Years
Travel Time Savings	\$0.0	\$0.2
Veh. Op. Cost Savings	-\$0.0	-\$0.2
Accident Cost Savings	\$0.2	\$3.7
Emission Cost Savings	-\$0.0	-\$0.0
TOTAL BENEFITS	\$0.2	\$3.7
Person-Hours of Time Saved	2,388	47,750
CO ₂ Emissions Saved (tons)	-59	-1,186
CO ₂ Emissions Saved (mil. \$)	-\$0.0	-\$0.0

Should benefit-cost results include:

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Default = Y
- 2) Vehicle Operating Costs? (y/n)

Default = Y
- 3) Accident Costs? (y/n)

Default = Y
- 4) Vehicle Emissions? (y/n)
includes value for CO₂e

Default = Y