

California Department of Transportation
Division of Design
Office of Special Projects

Value Analysis Program



ANNUAL REPORT

Federal Fiscal Year 2009/2010

October 1, 2009 - September 30, 2010



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EXECUTIVE SUMMARY

The Federal Fiscal Year (FY) 2009/10 was a busy year for the Department's Value Analysis (VA) Program. Utilizing the statewide VA contracts, studies are performed continuously throughout the year. Over 34 task orders were written to perform studies this year. This requires a great deal of effort and persistence to coordinate and perform these studies. The team of District VA Coordinators work diligently to ensure the success of the VA program.

Last year, 54 studies were completed on projects with a total cost (capital and support) of over \$4.88 billion. Of the 54 studies, 31 were performed by Caltrans staff with consultant Certified Value Specialist (CVS) team leaders. The other 23 studies were performed by our local partners such as cities, counties, and local transportation authorities. The results of these studies are also included in this annual federal VA report.

The Department reported a savings of \$305 million to the Federal Highway Administration (FHWA) for the 2009/10 federal fiscal year. These savings were derived from the "Accepted Alternatives" proposed by the VA teams and implemented by the decision-makers, project managers, functional managers, and Project Development Teams (PDT). In comparing the cost savings to the cost to conduct the studies, the Department achieved a Return on Investment (ROI) of 126:1 meaning \$126 in savings for every dollar spent on conducting the study.

The Joint Stewardship and Oversight Agreement between the Department and the FHWA lists four performance indicators/measures for the Value Analysis Program: percent of required studies conducted, number of non-required studies conducted, percent project cost savings, and implementation rate. The Department conducted 100 percent of all required studies for the 2009/10 Federal Fiscal Year. In addition, the Department performed nine studies on projects costing less than the \$25 million threshold for highway projects or the \$20 million threshold for Bridge projects. The Department also reported an average cost savings of 6 percent, which is consistent with the national average and meets the stewardship target. The implementation rate is determined by comparing the number of proposed recommendations to the number of implemented recommendations. The Department's implementation rate was 46 percent for last year.

In addition to performing project VA studies, the Department's VA Program has many other activities throughout the year. This year has been no exception. This year, the VA program went through a FHWA process review, performed several "business practice" improvement studies, and started a few pilot programs to improve the VA process in the future.

2009/2010 PROGRAM RESULTS

During the federal fiscal year ending September 30, 2010 the Department completed the following Value Analysis activities:

- Fifty-four (54) studies were completed including nine (9) non-mandated studies. The total estimated project cost of the fifty-four (54) transportation projects completed was \$4,875,600,000. Of the 54 studies, Caltrans performed 31 studies using the Departments' statewide contracts, and the remaining studies were performed by our local partners.
- An additional twenty-three (23) transportation project studies were performed, but not completed this FY. The results of these studies will be reported when complete.
- Project teams implemented 119 of 260 proposed recommendations resulting in \$305,000,000 in savings. Table 1 summarizes the results of the VA transportation project studies.
- In addition to the project VA studies, two process VA studies were performed. These studies are designed to improve the Department's business practices. See the "Process Review Section" (page 8) for details on these studies.
- Thirty-three (33) Cost Reduction Incentive Proposals (CRIPs), also known as Value Engineering Change Proposals (VECPs), were submitted by contractors and approved by the Department resulting in savings of \$2,900,000 (the State shared 50% of these savings).

Table 1: Value Analysis Studies – Federal FY 2009/2010

Study Sponsor	No. Studies	Original Project Costs	Value Analysis Alternatives				Total Study Cost	Return on Investment	Project Savings	Implementation Rate
			Proposed		Implemented					
		(\$Million)	No.	Savings (\$Million)	No.	Savings (\$ Million)	(x 1000)			
Caltrans	31	\$2,608	135	\$142	60	\$48	\$1,463	33:1	2%	44%
Local Agency	23	\$2,267	125	\$342	59	\$257	\$951	270:1	11%	47%
Total	54	\$4,875	260	\$484	119	\$305	\$2,414	126:1	6%	46%

The VA program has been striving to improve the quality of alternatives so that the decision-makers can be confident in approving and implementing recommended changes. The **total implementation rate** of the VA Program (the percentage of Implemented Alternatives with respect to Proposed Alternatives) was **46%**. One of the main barriers to implementation is the timing of the study. Table 2 shows the average return on investment, implementation rate and savings by project phase. The greatest return on investment is when a study is performed in the planning phase (K phase). However, due to budgetary constraints, the Department typically performs the study once the project is programmed for delivery. When the VA team is constrained by the timing of the study, the return on investment and project savings fall dramatically.

Table 2: VA Study Results by Phase

Project Phase	# of Studies	ROI	Implementation Rate (%)	Savings %
Planning	4	919	75	13
PA&ED	27	72	37	4
Early PSE	9	31	64	3
Late PSE	14	-12	35	-1

Table 3 shows a comparison of results by District. Districts 4 and 6 completed the most studies (9 each) last year. District 3 had the highest return on investment (386:1). Districts 11 and 12 achieved more than 100:1 ROI. Districts 1, 7 and 11 had the highest implementation rates (67%, 65% and 64% respectively). District 3 had the highest average cost savings (22 percent) with District 12 also having an impressive savings of 15%.

Table 3: VA Study Results by District

District	# of Studies	ROI	Implementation Rate (%)	Avg. Project Savings (%)
1	2	57	67	7
2	4	-22	27	-2
3	8	386	37	22
4	9	8	41	1
5	2	23	40	3
6	9	49	53	5
7	4	-31	65	-1
8	8	95	41	3
10	2	59	56	3
11	3	307	64	4
12	3	295	29	15
Statewide Totals	54	126	46	6

HISTORICAL PROJECT SAVINGS

The historical savings from the Department's VA program are presented graphically in Chart 1 and Table 5. Chart 1 shows the cumulative savings over the past 20 years. Almost \$2.7 billion in savings has been realized from over 650 studies performed. Table 5 indicates the number of studies performed by each District over the last 20 years.

**Chart 1:
Cumulative Project Saving**

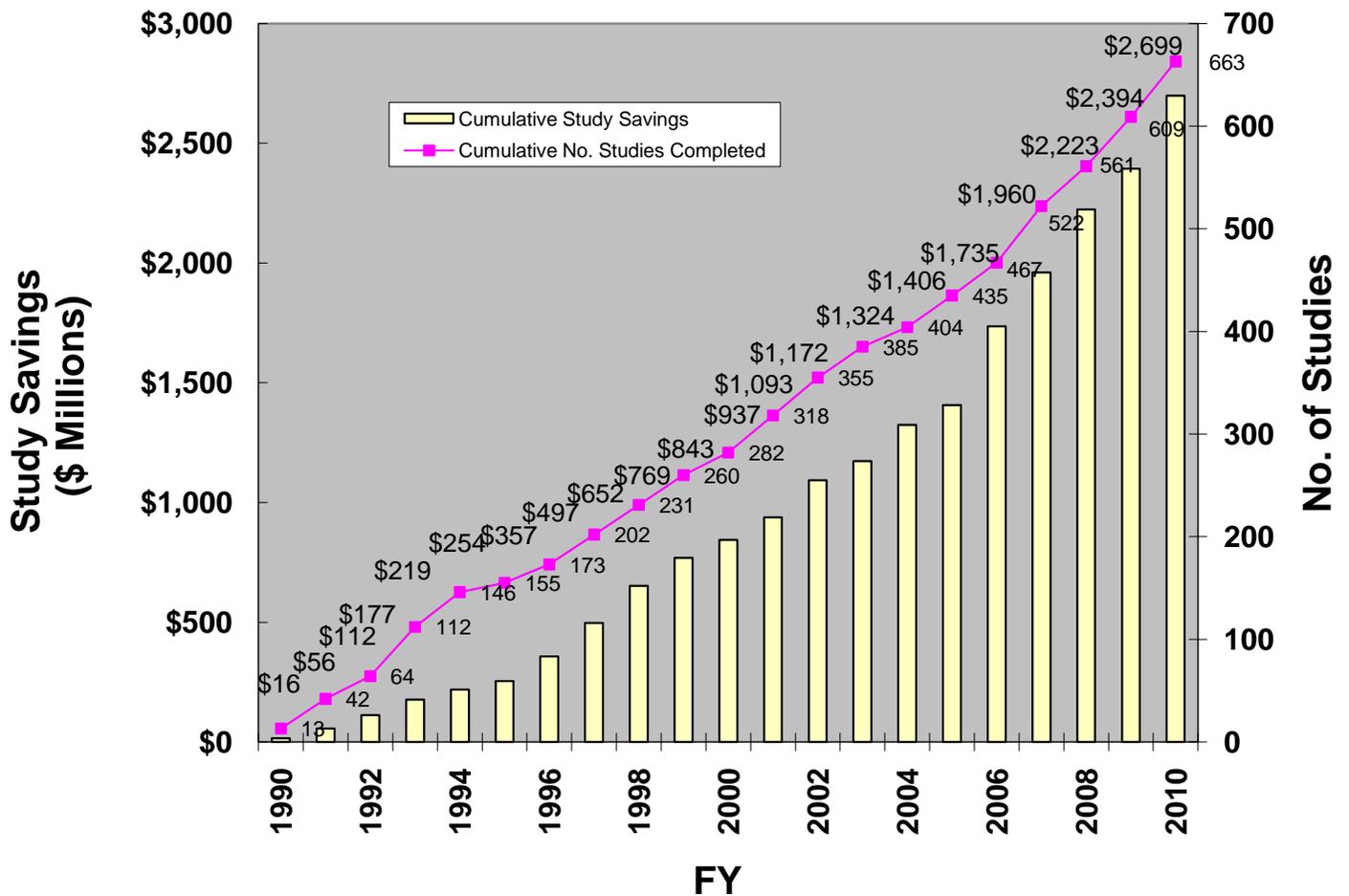


Table 5: Number of VA studies Completed (1990-2010)

District	Fiscal Year																				Total	
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		2010
1	1	0	2	3	2	1	1	0	1	0	0	0	3	1	0	1	0	0	0	2	2	20
2	2	6	0	6	3	0	2	3	0	1	1	2	1	0	1	1	1	3	0	2	4	39
3	0	1	1	2	0	2	1	0	1	2	0	4	1	1	1	3	1	4	4	5	8	42
4	2	4	5	6	6	0	8	10	6	6	6	7	15	6	5	4	9	8	8	8	9	138
5	1	5	6	0	2	0	0	1	0	0	1	1	1	0	0	2	2	8	0	4	2	36
6	0	2	2	4	0	0	0	2	2	2	0	2	1	2	2	2	2	3	2	3	9	42
7	1	0	0	4	1	1	0	2	8	7	1	5	6	9	6	5	3	5	5	5	4	78
8	0	1	0	7	11	0	1	2	1	2	3	3	4	9	1	9	7	16	8	13	8	106
9	2	1	1	2	1	0	0	1	0	0	3	2	2	0	0	0	0	0	0	0	0	15
10	2	2	0	1	1	0	0	0	2	0	2	2	0	1	0	1	6	5	5	3	2	35
11	2	4	5	12	5	5	3	7	6	6	5	7	1	1	3	3	1	2	5	1	3	87
12	0	3	0	1	2	0	2	1	2	3	0	1	2	0	0	0	0	1	2	2	3	25
Total	13	29	22	48	34	9	18	29	29	29	22	36	37	30	19	31	32	55	39	48	54	663

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PERFORMANCE CRITERIA

In addition to realizing substantial cost savings, the Department is also working closely with our local partners to find common ground to maximize the performance of projects. This year marked the third year that FHWA required the Department to report how the VA studies affected the performance of projects. The Department's VA Program was the first program in the nation to use performance criteria during VA studies. Now, years later, FHWA has adopted these measures to capture the successes of VA alternatives.

FHWA has divided the performance criteria into five categories; Safety, Mobility, Operations, Environmental Impacts, and Innovative Construction. These differ slightly from the Department's standard performance measures. The Department includes Maintainability and measures Local Operations and Mainline Operations separately. FHWA has asked the states to identify the number of accepted alternatives that impact one or more of the five performance categories significantly. At this time, only positive impacts are being reported, see Table 4.

This year the Department reported 26 alternatives improving Operations, 37 alternatives improving Environmental Impacts, 57 alternatives that improved the Constructability of the project, and 43 others such as Maintainability.

Table 4: Positive Performance Improvements by District

District	Operations	Environmental	Innovative Construction	Other
1	3	1	1	4
2	2		2	
3	1	1	5	6
4	4	5	9	3
5		2	3	1
6	4	15	8	9
7	2		1	10
8	5	3	9	6
10			3	
11	4	7	12	3
12	1	3	4	1
Total	26	37	57	43

OTHER VA PROGRAM ACTIVITIES

Throughout the year, the HQ VA Program partners with the Districts and Divisions to use the VA process to benefit the Department. Because VA provides a structured approach for process improvements, VA is a perfect tool for the Department.

Besides delivering VA studies on all projects over the \$25 million FHWA threshold, VA was also performed on nine (9) projects that were non-mandated. The benefits from the studies included consensus building with our stakeholder and problem solving by our PDTs.

In addition to performing VA studies, the HQ VA program also went through a rigorous FHWA Process review, performed several business practice process reviews, and even participated in a technical exchange program with the Korean Expressway Corporation (KEC) to learn best practices and share ideas on how to better each other's VA programs.

PROCESS STUDY REVIEWS

The VA Program uses the VA process to streamline and improve on the way the Department does business. The VA Program initiated studies to develop the Design Build document templates to improve the landscape of highways for sustainability. The GIS corporate structure and Document Retrieval System (DRS) policy studies also continued into this year.

The focus of the Design-Build (DB) VA process study was to bring in experts from other successful DB Departments of Transportation to help develop the templates needed for the RFQ/RFP that will be used for delivery of the DB Demonstration Program Projects. This program was authorized by the Legislature in February 2009 to deliver 15 DB projects by the year 2014 including 10 by the Department and 5 by Local Agencies.

District 11 performed a VA study to establish a "blueprint plan" for incorporating sustainable/maintainable planting and insert landscaping into existing and future projects that takes into consideration the region's limitations on water usage, increasing water rates, and increasing inventory for landscape maintenance.

Work on the GIS VA study continued this year. New documentation was generated by the GIS Implementation Team to establish a corporate structure that would lead the Department into the 21st century. Because creating a new GIS Division is not likely in today's economic environment, the team structured a new Geospatial Management Board (GMB) to govern a technical advisory committee (GDMC) that will organize and develop Geospatial data and applications. The team also recommended a new position for a Geospatial information Officer (GIO) to reach across state departments and align Caltrans with other data gathering departments. These options are being considered for implementation.

Work continued with the Document Retrieval System (DRS) VA study. A position was re-allocated to help the understaffed administrator in headquarters. Also, it was determined that DRS is being used by many divisions in the Department, however, there has been no effort to fund the work involved. The DRS VA team is in the process of establishing policy to

determine which documents are needed for archival purposes. Once policy is established, divisions will better understand their obligations.

FHWA REVIEW PROCESS

Last summer, FHWA conducted an extensive review of the Department's Value Analysis Program. The review focused on evaluating and documenting the VA Program practices as they relate to the findings of the 2005 audit conducted by the Office of Inspector General (OIG), as outlined in their 2007 *Value Engineering in the Federal-Aid Highway Program* Report. The 2007 OIG Report contained seven recommendations that endeavored to improve Caltrans' Value Analysis Program and ensure its compliance with Federal requirements. This year, the Review Team focused on these seven recommendations and explored ways to enhance the overall Value Analysis Program in California. Based upon the outcome of this comprehensive review, it was deemed that Caltrans' Value Analysis Program substantially meets FHWA requirements.

The FHWA review was focused on two areas of interest: whether required studies were performed to meet the mandate, and whether the accepted alternatives were implemented through or into construction. The Review team, made up of FHWA personnel and the VA Program team (including HQ and District VA Coordinators), reviewed all the projects that were subject to the 2005 SAFETEA-LU requirements.

In regards to meeting the mandate, it was found that two projects out of 160 reviewed failed to meet SAFETEA-LU requirements. Both projects were locally funded and were thought to have exemptions due to timing. These local agencies were informed of the requirements.

In regards to the accepted alternatives, due to the overwhelming number of projects and alternatives, the Review Team statistically sampled accepted recommendations so as to achieve a 95% confidence level with a 15% margin of error. Out of the 251 accepted alternatives (both State and Local projects), 65 accepted alternatives were investigated by the team. It was found that many alternatives were implemented, however, many were modified or rejected as the project moved forward in the delivery process. Therefore, the FHWA team recommended the Department to take further action to address some deficiencies.

The following recommendations are currently being addressed and implemented by the Department's VA team:

- Develop a process to outline which responsible State management will sign off on the rejection of any Value Engineering recommendations with "substantial cost savings".
- Develop a process to outline management approval authority for not implementing "Approved Alternatives" during Design and Construction.
- Update both the Department's Value Analysis Team Guide and Report Guide to reflect SAFETEA-LU requirements.

- Address the use of Life Cycle Cost (LCC) Analysis on all VA/VE studies per Department guidance.
- FHWA agreed to participate on 50% of the High Profile studies.

TECHNICAL EXCHANGE PROGRAM

On January 20, 2006, the Department and the Korean Expressway Corporation (KEC) entered into a Memorandum of Understanding (MOU). The purpose was to strengthen transportation-related scientific and technological capabilities and management methods, and to provide a framework for the exchange of transportation-related technology, to encourage the application of new technology and to improve the management system of both organizations.

Both the Department and KEC recognize each other's experience and knowledge in the area of VA, and in June 2010, entered into technical exchange activities to explore new ideas. This exchange includes having KEC perform VA studies on "live" projects prior to the Department's VA studies, and then having the Department analyze the recommendations from KEC for possible implementation into the project.

A list of potential projects was sent to KEC for discussion, and at this time, one project was selected. The first project selected was a bridge replacement project in District 4, Laguna de Santa Rosa Bridge in Sebastopol.

After a site visit with District 4 engineers, District VA Coordinators, and a KEC exchange engineer, Bong-Kyung Kwon (BK), the project information was sent to KEC for their analysis. The study is currently being reviewed and will be reported in the next annual report (FY 10-11). Two additional studies will be performed over the next year to continue this exchange.

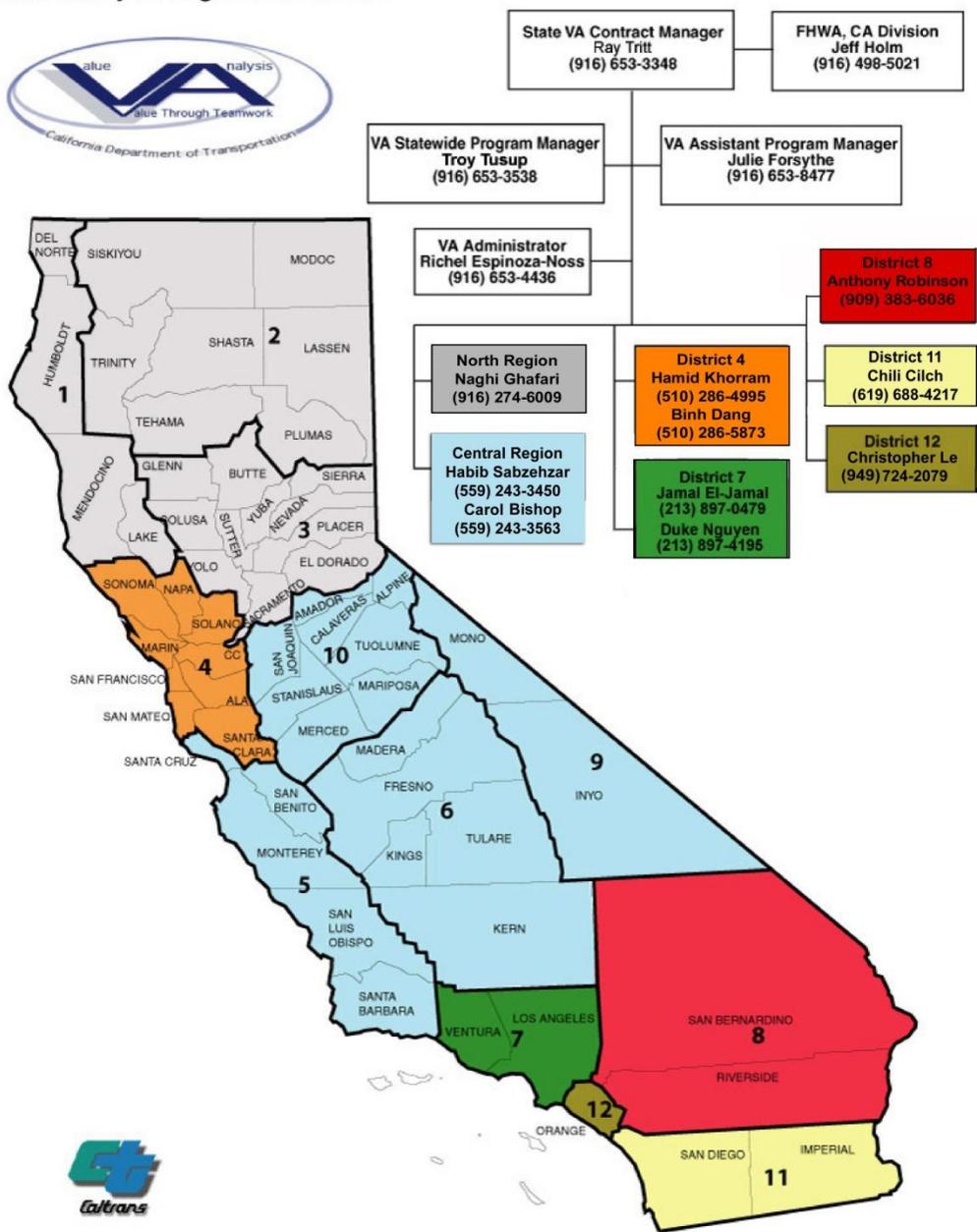
VA PROGRAM ORGANIZATION

The Department has been actively engaged in Value Analysis (VA) for more than 40 years. Both consultants and in-house VA team leaders are used to organize and conduct VA studies under the leadership of District VA Coordinators (DVAC). The Office of Special Projects in the Headquarters Division of Design manages the VA Program for the entire state.

VA Program Mission: Provide stewardship and improve mobility across California through application of the VA methodology on the Department's projects, products, and processes.

VA Program Vision: The Department is a leader in the application of Value Analysis in the transportation industry.

Value Analysis Organization Chart



UPCOMING EVENTS

- Twenty three other studies were performed, but not finalized, in fiscal year 2009/2010. These studies are in various stages of progress and most will be reported next year. Many of these studies were performed on local projects where the Department played an oversight role in the process.
- The Department's VA Program is in the process of renewing their Value Analysis contracts for Certified Team Leaders and Industry Experts this year.
- The Department's VA Program will be introducing a one day training workshop on "How to be an Effective VA Team Member".
- The 2011 American Association of State Highway Transportation Officials (AASHTO) Value Engineering Peer Exchange Workshop will be held this September in Louisiana. This joint workshop with DOT and FHWA VE experts will continue talks on policy and procedural changes needed throughout the nation.
- The Department's VA guidance will be modified to meet the 2010 FHWA review team's process improvement recommendations.

Caltrans Delivers Value

