

Local Assistance Day Statewide Webinar

Value Engineering Analysis

Wenyi Long
Senior Transportation Engineer
Caltrans Local Assistance Office of Guidance & Oversight
Wenyi.Long@dot.ca.gov

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Value Engineering Analysis



Presenters

Wenyi Long

Caltrans Division of Local Assistance
Office of Guidance & Oversight

Wenyi.Long@dot.ca.gov

Kitae Nam

Caltrans Division of Local Assistance
Office of Guidance & Oversight

Kitae.Nam@dot.ca.gov



Value Engineering Analysis



Overview

- What is Value Engineering (VE)
- When to Conduct Value Engineering Analysis
- Purpose of Value Engineering
- Value Engineering Analysis Process
- Resources



Value Engineering Analysis



What is Value Engineering

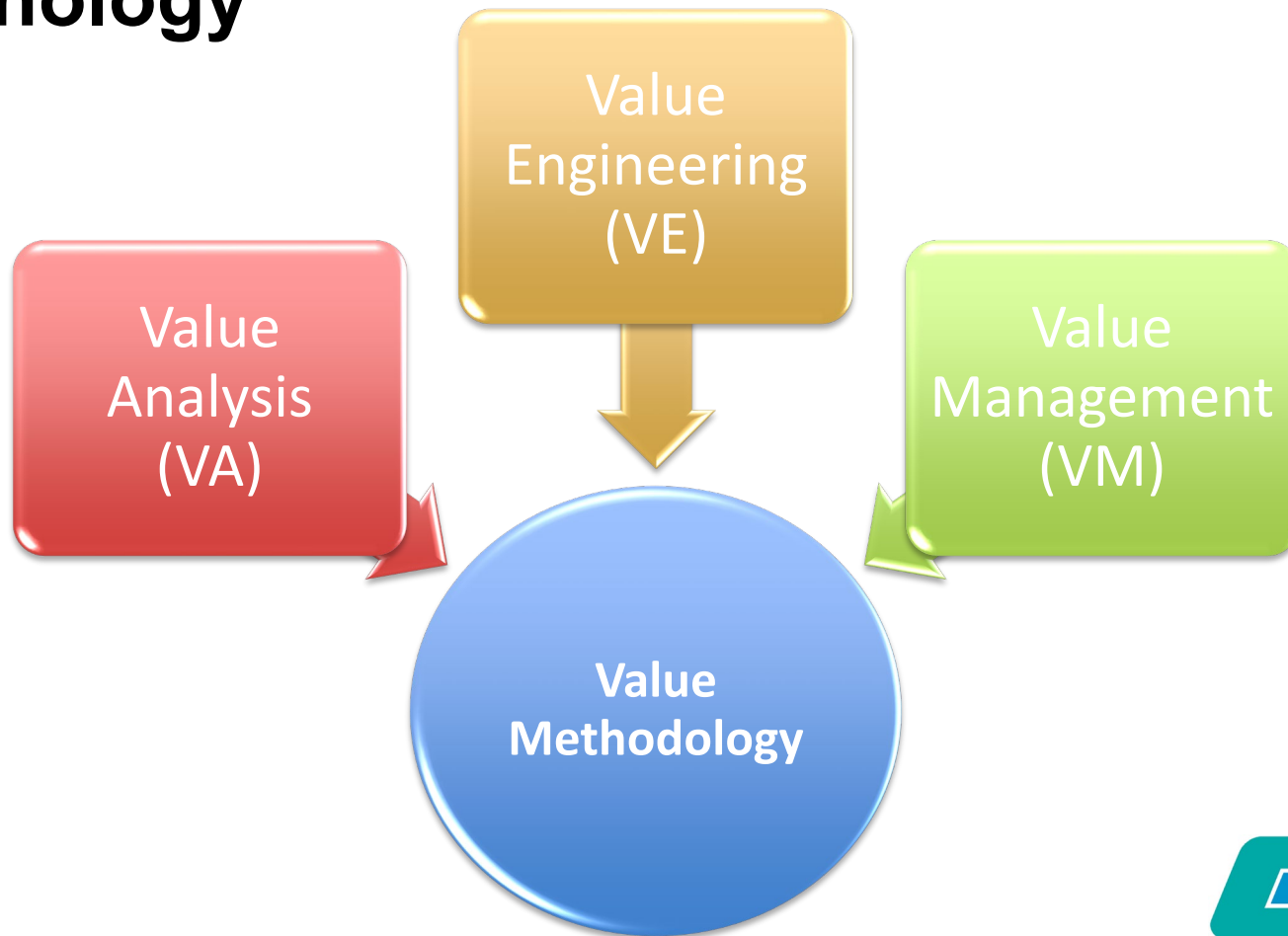
- Function-oriented, systematic process of reviewing, analyzing, and improving the value of a project
- Conducted by a multidisciplinary team not directly involved in the planning and development phases of a specific project
- Follows the VE Job Plan



Value Engineering Analysis



Terminology



Value Engineering Analysis



When to Conduct Value Engineering Analysis

- There is no universal "best time" to conduct VE analyses that would apply to each and every project; VE should be conducted as soon as sufficient information is available to perform an analysis
- Value Engineering analysis shall be conducted prior to the completion of final design on each applicable project
- All approved recommendations shall be included in the project's plans, specifications and estimates prior to [authorization for construction](#)



Value Engineering Analysis



Purpose of Value Engineering

- Achieving design excellence by investigating and analyzing the design of a project, analyzing project functions and costs
- Improving and optimizing the value and quality of the project
- Reducing the time to develop and deliver the project
- Generating alternatives for the project that satisfy the needed functions



Value Engineering Analysis



Background of Value Engineering

[23 Code of Federal Regulations, Part 627](#)

** Federal Highway Administration can withhold Federal-aid highway funds on any eligible project that did not receive a VE analysis. **



Value Engineering Analysis



Applicable Projects

Federal requirements mandate a Value Engineering Analysis be performed on the following projects:

1. All federal-aid highway projects on the NHS with a total estimated project cost of \$50 million or more
2. All federal-aid bridge projects on the NHS with an estimated total cost of \$40 million or more
3. Any major project (as defined in 23 U.S.C. 106(h)), located on or off the NHS, that utilizes federal-aid highway funding in any contract or phase comprising the major project



Value Engineering Analysis



Applicable Projects (continued)

4. Any project where a VA has not been conducted and a change is made to the project's scope or design between the final design and the construction letting which results in an increase in the project's total cost exceeding the thresholds identified in (1), (2), or (3) of this section
5. Any other project FHWA determines to be appropriate that utilizes federal-aid highway program funding.
6. CMGC Projects, if the project meets the requirements identified in the above 1-5



Value Engineering Analysis



Value Engineering Analysis Process

1. Preparation Phase: What are we studying? Who is on the team? When do we do it?
2. Information Phase: Gather project information including project commitments and constraints
3. Function Analysis Phase: Analyze the project to understand the required functions
4. Creative Phase: Generate ideas on ways to accomplish the required functions which improve the project's performance, enhance its quality, and lower project costs
5. Evaluation Phase: Evaluate and select feasible ideas for development
6. Development Phase: Develop the selected alternatives into fully supported recommendations
7. Presentation Phase: Present the VE recommendation to the project stakeholders
8. Implementation Phase: Evaluate, resolve, document and implement all approved recommendations



Value Engineering Analysis



VA STUDY AGENDA Example Project

WEEK 1

Day 1 – Tuesday

Kick-Off Meeting

- 8:00 VA Team Arrival and Setup
- 8:15 Introductions (All) and VA Agenda Review (VA Team Leader)
- 8:30 Project Overview (Project Manager and Engineers)
- 9:30 Stakeholder Issues and Concerns/Qualitative Risk Assessment
- 10:30 Performance Attributes Prioritization and Performance Requirements Identification
- 11:15 Performance Ratings of Design Alternatives
- 12:00 *Conclusion of Kick-Off Meeting - Lunch*
- 1:00 Site Visit
- 4:30 Recap Site Visit and Identify Added Team Issues/Qualitative Risk Assessment
- 5:00 Adjourn

Day 2 – Wednesday

- 8:00 Team Review of Review Project Information, Cost Estimate, Cost Model, and Issues
- 9:00 Identification of Issues for Further Clarification from Project Team
- 10:00 Function Analysis/FAST Diagram
- 12:00 Lunch
- 1:00 Cost/Function and Performance/Function Analysis
- 2:00 Team Brainstorming
- 5:00 Adjourn

Day 3 – Thursday

- 8:00 Team Brainstorming (continued)
- 9:30 Team Evaluation of Ideas
- 12:00 Lunch
- 1:00 Team Evaluation of Ideas (continued), Team Assignments for Development
- 2:00 Review Alternative Development Process
- 2:30 Research and Refine Ideas
- 5:00 Adjourn
- 5:00 Adjourn



VA STUDY AGENDA Example Project

WEEK 2

Day 4 – Tuesday

- 8:00 Review Research, Alternatives for Development, and Assignments
- 9:00 *Technical Review Meeting*
- 11:00 Develop and Document Alternatives
- 12:00 Lunch
- 1:00 Develop and Document Alternatives (continued)

Day 5 – Wednesday

- 8:00 Develop and Document Alternatives (continued)
- 12:00 Lunch
- 1:00 Finalize Development and Documentation of Alternatives
- 2:30 Group Review and Ranking of VA Alternatives/Strategies
- 4:00 Qualitative Risk Assessment - VA Alternative Risk Response Impact
- 5:00 Adjourn

Day 6 – Thursday

- 8:00 Presentation Preparation
- 12:00 Lunch
- 1:00 *Presentation of VA Alternatives to Management and Project Stakeholders*
- 3:00 Adjourn



Value Engineering Analysis



Value Engineering Study Length

- 6 Day Caltrans Standard (40-hour work plan)
 - Ideally – two 3-day sessions
 - 5 Day acceptable for many smaller projects
- Length determined after Pre-Meeting by complexity of project and study scope
- VA Process can not be completed Properly in 3-days or less
- Large Complex Projects may require Multiple Studies or longer durations



Value Engineering Analysis



Value Engineering Report

After the VE, a formal report shall be produced to include the following:

1. Project information
2. Identification of the VE analysis team
3. Background and supporting documentation, such as information obtained from other analyses conducted on the project (e.g., environmental, safety, traffic operations, constructability)
4. Documentation of the analysis conducted
5. Summarization of the analysis conducted
6. Documentation of the proposed recommendations and approvals received at the time the report is finalized

The formal written report shall be retained for at least 3 years after the completion of the project. Submit a copy of the report to the DLAE who to the District Value Analysis Coordinator (DVAC).

forwards it



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Value Engineering Analysis



Resource

[Frequently Asked Questions - Value Engineering - Design - Federal Highway Administration \(dot.gov\)](#)

[About - Value Engineering - Design - Federal Highway Administration \(dot.gov\)](#)

[Value Analysis | Caltrans](#)



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Contact

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