

Value Engineering

Effective: October 15, 1997

UDOT 08A4- 01

Revised: June 16, 2015

Purpose

To establish a policy and procedures for the Utah Department of Transportation (Department) for selecting, studying, and reporting on Value Engineering (VE) projects.

Policy

The Department will establish and maintain a program utilizing the Value Engineering (VE) discipline on selected projects, items, procedures, and processes to reduce cost, improve performance, and increase productivity. VE techniques can be used to improve productivity or the benefit to cost ratio and life-cycle cost savings in nearly every aspect of the state's transportation program, including Preliminary Engineering, Traffic Operations, Construction, Maintenance, Standard Drawings and Specifications, and Design Criteria and Guidelines. The Federal Highway Administration encourages and supports the State to utilize the VE process throughout highway project development, construction, operation, and maintenance, as evidenced by FHPM No. 6-1-1-9. The American Association of State Highway and Transportation Officials (AASHTO) also endorse the concepts of Value Engineering in its "Guidelines for Value Engineering."

VE objectives will be achieved by following the guidelines set forth in UDOT 08A4-01.1 through 08A4-01.6 and in the Value Engineering Manual of Instruction.

The associated procedures are set up by phase:

Preconstruction Phase	UDOT 08A4-01.1
Construction Phase	UDOT 08A4-01.2
Training Phase	UDOT 08A4-01.3
Maintenance Phase	UDOT 08A4-01.4

Procedures

Preconstruction Phase

UDOT 08A4-01.1

Responsibility: Deputy Preconstruction Engineer, Region Preconstruction Engineer, Region Program Manager, and Project Manager.

Actions

1. Select projects at the Concept phase that appears to be good candidates for a VE Study. The Concept Report should indicate that a VE Study should be considered. A VE Study should be considered for major projects with significant potential for savings or improvements in project effectiveness. Some typical characteristics of potential VE projects are:
 - a. projects that substantially exceed initial cost estimates;
 - b. items that have questionable function or are complex and provide unique but costly functions;
 - c. large structures;
 - d. items using critical or expensive materials;
 - e. items requiring difficult construction or fabrication procedures;
 - f. items that are the result of custom, tradition or opinion;
 - g. items that appear to be too costly to build or maintain;
 - h. projects having accelerated design times;
 - i. designs that have grown too complex by being added to over a long period of time;
 - j. any Federally funded project on the National Highway System (NHS) estimated to cost \$50 million requires a VE study.
 - k. any Federally funded bridge project on the NHS estimated to cost \$40 million or more requires a VE study.

Responsibility: Value Engineer, Deputy Preconstruction Engineer, Project Manager

2. Establish VE Teams. Proper selection of team members is very important to the success of the VE study. The Project Manager should review potential team members and select persons in such a makeup that complies with these requirements and lends to a creative atmosphere. Value Engineering team structure is governed by the following:
 - a. Multi-disciplined – a basic concept of value engineering requires that teams be multi-disciplined. Teams should be structured so there is appropriate expertise to evaluate the major areas anticipated within the project. In no case should a majority of the team represent one area of expertise.
 - b. Team Size – VE teams normally consist of not less than five nor more than eight members, including the team leader. Project Manager, Project Design Engineer, Consultant Project Manager, or other persons directly responsible for the planning or design generally shouldn't be team members, but are expected to participate as an information source.
 - c. Maintenance, Construction and Design representation – Each VE study team should consist of representation from maintenance, construction, and design offices from within the Region where the project resides.
 - d. Project Specific – Persons with specific expertise necessary to perform a proficient VE review should be included in the team makeup in the event of specialized projects. The Value Engineer should obtain the services of qualified experts from private consultants or contractors as team members if necessary.
 - e. Team Leaders – Each VE study team will have a team leader appointed by the Project Manager. The Team Leader will have the responsibility for conducting the project review in accordance with these procedures. Team Leaders must have served on at least two team studies as a member and have attended a forty-hour VE workshop.
 - f. Team Independence – The VE team will be independent of other design review processes.
3. Notify team members and responsible designer of the date selected, location and expected length of study at least one month in advance.

4. Conduct the VE study according to the methods outlined in the Department's Value Engineering Manual of Instruction.
 - a. The value engineering process has a nine phase value engineering job plan. The phases are:
 1. Selection
 2. Investigation
 3. Analysis
 4. Speculation
 5. Evaluation
 6. Development
 7. Presentation
 8. Implementation
 9. Program Review
 - b. The Project Manager is responsible for VE job phases 1, 8, and 9 while the VE teams perform tasks in phases 2 through 7.

Responsibility: Region Preconstruction Engineer

5. Compile and supply all required project data to Team Leader. This data includes the Concept Report, Plan Sheets including typical sections, environmental documents, cross-sections, profiles, Structure Situation & Lay-out, aerial photographs if available, traffic projections and a detailed estimate.

Responsibility: Value Engineer Consultant and VE Team

6. Conduct VE Study.
7. Prepare presentation of VE Team recommendations for those responsible for design of the project.
8. Prepare summary of VE Team recommendations and make presentation to Project Manager, Program Manager, Preconstruction Engineer, District Engineer, and Region Director.

9. Distribute summary to responsible design party and Engineer for Preconstruction.

Responsibility: Region Preconstruction Engineer

10. Review the VE Team recommendations and adopt those that benefit the total project.
11. Submit memo within 30 days of study to Deputy Preconstruction Engineer stating which VE recommendations were adopted and why the others were not adopted.

Responsibility: Value Engineer Consultant, Deputy Preconstruction Engineer

12. Prepare final report concerning the VE Study results.
13. Complete annual FHWA Value Engineering Summary Report.

Responsibility: Region District Engineer

Actions

1. Evaluate and process all Cost Reduction Proposals according to Department Standard Specifications for Road and Bridge Construction Section 00725.
2. Consult with Deputy Preconstruction Engineer on any questions.
3. Maintain a listing of all approved cost reduction proposals.
4. Report all approved cost reduction proposals to the Deputy Preconstruction Engineer in August of each year.

Responsibility: Deputy Preconstruction Engineer

5. Prepare final and annual VE reports for FHWA.

Training Phase

UDOT 08A4-01.3

Responsibility: Deputy Preconstruction Engineer

Actions

1. Schedule and arrange 40 hour FHWA VE workshops for Department employees as funding permits in conjunction with the Training Section.
2. Conduct 1½ day workshops for Department employees using previously completed VE studies.
3. Keep current roster of Department employees that have had formal VE training and the extent of that training.

Responsibility: Region District Engineer or Engineer for Maintenance

Actions

1. Submit item such as a procedure, equipment use, or materials on which a Value Engineering Study is requested to the Deputy Preconstruction Engineer.

Responsibility: Deputy Preconstruction Engineer

2. Select whether a team study, no study, or an individual study by a Consultant Value Engineer is most appropriate.

Responsibility: Consultant Value Engineer

3. Conduct VE team study or individual study as recommended by Deputy Preconstruction Engineer.
4. Prepare summary of VE study recommendations for original proposing party.

Responsibility: Engineer for Maintenance or District Engineer

5. Review VE Study recommendations and adopt those that benefit the Department.

Responsibility: Consultant Value Engineer

6. Prepare final report concerning VE Study results.