

Missouri Department of Transportation Value Engineering Unit

Project Manager's Guide

INTRODUCTION

Purpose of the PM Guide

This brief guide is oriented to the project manager whose project will be the subject of a value engineering study in the near future. This guide is intended to facilitate the organization of the VE activity for optimum results for MoDOT. This guide supplements the Project Development Manual, Sec 2-05, Value Engineering. It helps define roles of CO VE staff and district staff.

Value Engineering Overview

Value Engineering is the systematic process of review and analysis of a project during its design/project development phase to provide recommendations to improve value while addressing the projects purpose and need. A Value Engineering review is made by a multidisciplinary team who:

- 1) investigate/analyze the planning, design and constructability of a project
- 2) identify project functions and their costs, and performance measures
- 3) creatively speculate on alternate ways to perform the various functions
- 4) evaluate the best value and/or least life-cycle cost alternatives
- 5) develop acceptable alternatives into supported recommendations
- 6) present the team's recommendations to district management

Value Engineering can be used during planning, conceptual study, design, construction and operation/maintenance phases of a project. Value Engineering is a proven management tool with over 50 years of successful experience around the world. Value Engineering is not a design review or a cost reduction; it is finding a second right answer!

Contents of Guide

This guide outlines the major items that generally must be accomplished in order to assure a successful VE activity, and indicates which items GHQ VE staff performs, and which items are performed by the project manager/district staff. Formal VE studies are conducted in three main phases: pre-study, study and post-study.

PRE-STUDY PHASE

The pre-study phase is a collaborative effort between the project manager, the design team and the GHQ VE unit. The following activities are vital to the success of the VE study. When requested and possible, a GHQ VE unit representative will travel to the district to facilitate collaboration. Generally, this should not be necessary, many pre-study activities can be accomplished via e-mail, fax and phone.

Notification of VE Study

Value Engineering studies require that the project manager gives a minimum of two months notice prior to the study. If this is not possible, please contact us to discuss. As per PDM sec 2-05, a VE workplan will be formulated after approval of the STIP by the Missouri Highways and Transportation Commission. Having the workplan helps us with scheduling and resourcing.

Upon notification, the VE Unit will contact the PM to discuss specifics such as the objectives of the VE study, team makeup, location of the study, data available and/or required, constraints to the study, etc.

Selection of VE Team and Leader

The project manager is encouraged to provide input as to the disciplines and/or specific personnel who should participate on the VE Team. Our intentions are that VE teams should be staffed with the most appropriate personnel and areas of expertise including MoDOT personnel, local agencies, consultant personnel and perhaps other stakeholders when appropriate. The make up of the team should be approved by the PM before commitments are made.

Project Team Participation

The VE unit encourages the participation of one member of the design team (not necessarily the PM) as a full member of the VE team. Sometimes it may be preferred to have a completely independent team, this needs to be determined early in the pre-study phase.

The PM/design team will be responsible for the project background info and/or the VE study baseline model to be used. The PM/design team will always be asked to conduct a brief design presentation at the beginning of the study. The design team will always be invited to the VE team presentation at the conclusion of the study

Constraints to Value Engineering

The ideal situation in value engineering is to have no constraints at all, but this will not always be possible. It is important to develop a formal statement of any constraints, and to have them approved by the appropriate authority, prior to the study. The VE Unit

prefers to include the formal statement of constraints in the study plan, which is distributed to the VE Team approximately one week in advance of the study. At the latest, however, the statement of constraints should be distributed and discussed during the design presentation.

Cost Model

The project manager should provide to the VE Unit, at a minimum of two weeks in advance of the VE Study, the cost estimate, which will be representative of the project at the time of the study. The VE Team Leader will arrange this estimate into a cost model (aka Pareto list) in advance of the study and provide it to the VE Team at the beginning of the study.

Development of Project Performance Measures (PPM)

Most if not all VE studies will utilize a Caltrans technique that evaluates and measures project scope performance, a method which can quantify how successful a project is in delivering its purpose and need. PPM may be applied a couple of ways, the preferred being for the VE Administrator to meet with the PM and Project Core Team prior to the study to develop the PPMs for the project. If this is not accomplished, the VE team will develop the PPMs.

Study Plan and Team Member Preparation Guide

The Value Engineering Unit will prepare and send these documents to the VE Team and to the project manager approximately one week in advance of the VE Study. The **study plan** is a logistics document, which identifies and briefly describes the subject of the VE Study, the agenda for the study and any constraints. It also identifies the members of the VE Team, the location of the study, study dates and times, etc. The **Value Engineering Team Member Guide** is a brief “primer” on value engineering, which describes for the team members how the study will be conducted, their roles, and the role of the VE Team Leader. The distribution of these documents will generally be by electronic mail, and the project manager is encouraged to forward them to others where appropriate.

VALUE ENGINEERING STUDY PHASE

Design Presentation

The project manager will determine the members of the design team, district representatives and others who will attend the design presentation, which serves as the kickoff for the VE Study. The study plan will indicate the exact time and location of the design presentation, and the PM should forward it on to the invited guests. Those attending may participate in the presentation, or may just be available for the Q&A session, which follows. The design presentation and Q&A session are generally limited to one hour. The Q&A session is often the most useful to the VE Team, and sufficient time should be reserved for it.

Site Visit

Site visits are recommended, design team representatives typically host this activity, the VE Unit does not consider it to be a formal PM responsibility.

The VE Study

Once the formal VE Study begins, we request that only the VE Team should be in the study location for any significant time. In some situations, “observers” may be useful and welcomed, but this can be a distraction to the VE Team and is not recommended. In any case, observers should be neutral in regard to the subject at hand.

The PM and design team members should be available during the week to answer any questions, provide background data or provide drafting and/or design support for the VE team.

VE Team Presentation

As mentioned previously, the design team is invited and encouraged to attend the VE Team presentation, which is generally held in the afternoon of the last day of the study. This presentation will usually be limited to approximately one hour, including Q&A's. The study plan will state the time and location for the VE Team presentation.

VE Study Report

The VE team leader and team members work on the report during the study in order to minimize the time to complete it. Generally, the report will be completed before the presentation and 25 copies will be made.

The VE Report is the result of an intensive team effort, and should be considered “final” as written. Although we respect the PM's opinion as to the viability of recommendations and other aspects of the report, we ask that no changes be made to the report by the PM or design team. If the design team wishes to convey additional information to decision-makers within his/her organization, this could be done using a cover letter or a companion report. The VE Unit must receive a copy of any such report.

POST-STUDY PHASE

Review and Implementation

The PM is responsible for monitoring and facilitating this process. We hope that all VE Reports will be carefully reviewed, with value-enhancing recommendations accepted and implemented. When the formal response is made, a copy will be sent to the VE Team Members, either by the VE Team Leader or by the PM. The VE Team Leader will assist the PM with the review and implementation process when requested to do so.

Review and implementation results received from the PM will be used to update the VE Unit's database. This information is reported internally and to the FHWA annually.

The Project Manager, core team members, and district management are all asked to complete the Post VE Evaluation Form, we wish to learn what went well and where we can improve.

CONCLUSION

This guide has been kept as brief as possible in order to make it more accessible to busy project managers. We believe in continuous improvement, and the guide will be updated as necessary. It is our responsibility to ensure that PM's have the latest version. Comments and suggestions for improvement are welcomed and encouraged!!

Acknowledgement is given to Rod Curtis (Retired AZDOT, current Mactec Employee) for development of this article.