

Washington State Department of Transportation Value Engineering Policy

GENERAL

WSDOT supports the initiatives taken by FHWA and AASHTO for many years to promote the use of Value Engineering (VE) in various transportation programs. WSDOT has developed a process for selecting the appropriate areas and projects for VE studies; performing VE studies at the appropriate time, and evaluating and implementing the recommendations developed in the VE process. The use of VE has the support of the top management of the department and the success of the VE program is dependent on the involvement, cooperation, and continued support of all of the department managers, both in the Headquarters and in the regions.

PURPOSE

VE is a management tool to be used in a systematic process designed to focus on the major and critical issues of a complex project or process, using a multidisciplined team to develop recommendations for the important management decisions that must be made. Using this organized analytical process, with relevant information, the resulting management decisions will provide direction for the continued project development. The outcome of value engineering studies is often cost reduction, but the primary focus is "Value Improvement."

WSDOT will use the VE process to seek value improvement in various forms. For projects, this may result in improvements in defining the proper scope, functional design, constructibility, coordination (both internal and external), and schedule for development. Other value improvements may include reduced environmental impact, reduced public (traffic) inconvenience, or reduced project cost. In summary, the VE process will seek to evaluate and incorporate, to the extent possible, the values of the design engineer, construction engineer, maintenance engineer, contractor, public, state and federal approval agencies, local agencies, and other stakeholders. The important design decisions that must be made will be formulated from the recommendations developed and presented by the VE team.

PROCEDURE

VE Process

A detailed discussion of the VE process is included in the state VE Training Manual entitled *Introduction To Value Engineering Principles and Practices*. The VE process will use the eight-step Job Plan as follows:

- **Selection Phase** - Select the right projects, team, timing, processes, or elements.

- **Investigation Phase** - Investigate the background information, technical input reports (such as traffic, soils, hydraulic, environmental, accidents) and field data, function analysis, team focus, and objectives.
- **Speculation Phase** - Be creative and brainstorm alternative proposals and solutions.
- **Evaluation Phase** - Analyze alternatives, technical evaluation, life cycle costs, documentation of logic, and rationale.
- **Development Phase** - Develop technical and economic supporting data to prove the feasibility of the desirable concepts or ideas. Develop team recommendations. Recommend long-term as well as interim solutions as applicable.
- **Presentation Phase** - Present the findings and recommendations of the VE team in an oral presentation at the conclusion of the study, and in a written report and workbook following the completion of the study. In many cases, the way the findings are presented can be as important as the findings themselves.
- **Implementation Phase** - The recommendations formulated by the VE team are given a fair and thorough evaluation by the appropriate managers of the department. Prepare an implementation plan including the response from the managers and a schedule for accomplishing the recommendations.
- **Audit Phase** - Establish a record system to track the results and accomplishments of the VE program on a statewide basis and to compile the appropriate statistical analysis as requested by management personnel.

Statewide VE Program Manager

The Statewide VE Program Manager is responsible for coordinating and managing the development and implementation of the statewide VE program in close cooperation with the Region VE Coordinators. In general, the duties of the Statewide VE Program Manager include:

- Promote and facilitate the use of VE principles and techniques in various applications including project concepts and design, construction, operations and maintenance, and for specialized problem solving in specific technical areas.
- Assist efforts to promote and support the overall VE program.
- Assist and support the Region VE Coordinators as necessary to assure smooth and efficient implementation of the VE program objectives and performance of VE studies.
- Develop with the assistance of the Region VE coordinator the statewide VE study plan from information furnished by the Region VE Coordinators.
- In coordination and cooperation with the Region VE Coordinator select the team leader and team members for each VE study.
- Establish a schedule with dates for studies in cooperation with the various Region VE Coordinators.
- Serve as team leader on various VE studies.
- Coordinate specialized VE study requests from major Olympia Service Center divisions.

- Develop, schedule, and participate in training for VE coordinators, team leaders, and team members.
- Develop and maintain a monitoring and reporting system to establish a data base for summarizing the VE program results and benefits.
- Assist in providing consultant services, as necessary, to supplement the WSDOT VE program.
- In cooperation with the region VE coordinator notify the team leader and team members in writing prior to each VE study.

Regional VE Coordinator

In addition to other duties, the Region VE Coordinator serves to accomplish the VE program in accordance with department policy and guidelines for VE. Suggested duties include, but are not limited to the following:

- Within a region, promote and facilitate the use of VE principles and techniques in various applications including project scoping, concepts and design, construction, operations and maintenance, and for specialized value improvement in specific technical areas.
- Assist in the study plan development and selection of projects for VE studies from the current and proposed "highway construction programs". Develop a biennial VE study plan, and update the plan annually. Submit VE planning information to the State VE Program Manager.
- Schedule each VE study and assist in the selection of the team leader and team members in coordination and cooperation with the Statewide VE Program Manager.
- Make arrangements for accomplishing the VE study including facilities and support equipment. Assure that the necessary input information and project plans and details are available for the team through the Project Design Office, and that project contact personnel are available during the study.
- Serve as VE team leader on various VE studies, both inside and outside of the Region.
- Provide specific VE study information (or a copy of the final report and workbook) to the State VE Program Manager at the conclusion of each study.
- Provide opportunity for training of VE team leaders and team members in cooperation with the State VE Program Manager.
- Maintain records of VE program accomplishments within the Region, including involvement of individual team members and availability of trained personnel.

Arrange for individuals who are knowledgeable and project stakeholders to brief the team on the first day of each study. This gives the team its charge and direction by identifying the critical input information, controlling decisions and constraints, and background and history for the study project.

SELECTION OF PROJECTS FOR VE STUDIES

Projects for VE studies may be selected from any of the categories identified in the Priority Programming Plan including "Preservation" or "Improvement", depending on the size and/or complexity of the project. In addition to the cost, other issues adding to the complexity of the project design should be considered in the selection process. These complexities may include: critical constraints, difficult technical issues, expensive solutions, external influences, or complicated functional requirements. The types of projects that usually provide the highest potential for value improvement are:

- Projects with alternate solutions which vary the scope and cost;
- New alignment or by-pass sections;
- Widening existing highways for capacity improvements;
- Major structures;
- Interchanges on multi-lane facilities;
- Projects with extensive or expensive environmental or geotechnical requirements;
- Difficult materials requirements or inferior material sources;
- Major reconstruction of existing highways;
- Projects with major traffic control;
- Projects with multiple stages.

The procedure to be used in the project selection process is as follows:

STEP 1. The Region VE Coordinator will identify projects for VE studies in the project summary form and will identify potential VE projects from the available planning documents for future work. The stage of development of each project will be identified.

STEP 2. The Regional VE Coordinator will present the projects identified in Step one to the regional management to prioritize the projects into a Regional VE Plan. (Value studies other than projects should also be considered in the VE Plan).

The Regional VE Plan will be reviewed by the State Design Engineer with respect to the content and schedule of the plan. Revisions (if necessary) will be negotiated with the Region, to finalize the plan for incorporation into the Statewide VE Plan.

STATEWIDE VE PLAN / SCHEDULE

On an biennial basis, the Regional VE Coordinators will submit to the State VE Program Manager the Regional Two Year VE Study Plan with specific projects scheduled by quarter. The Region and OSC division plans will be used to establish the Statewide VE Plan and will become the basis for determining the program needs including team members, team leaders and training. Since this is a working document, close coordination is required between the Olympia Service Center and the Regions. The schedule should be updated as revisions occur.

VE STUDY TIMING

The timing of a VE study is critical to the success of the project programming and development. The WSDOT VE program identifies three potential windows of opportunity for accomplishing the VE study.

Concept Stage

At the concept stage of development, the project scope and cost are under consideration. Preliminary engineering information should be available and the specific deficiencies or "drivers" should be identified. At this stage there is the maximum opportunity to consider the various alternatives or solutions and there is high potential that the recommendations of the VE Team can be implemented.

At the conclusion of the VE study, the project scope and cost can be established and the major decisions can be made to direct the further development of the project. When conducting studies on projects in early conceptual stages, care must be taken to focus heavily on issues affecting project "drivers" and not to go after dollar savings per se. The focus here should be on tracking the way the recommendations are implemented.

Schematic Design Stage

At the schematic design stage, the project scope and cost have been established and the major design decisions have been made. Normally some PS&E activities have begun and coordination has been initiated with the various service units that will be involved with the design. At this stage, the established project scope, cost, and schedule will normally define the limits of the VE study. There is still opportunity for a VE study to consider the technical issues for each of the specific design elements.

30 Percent Development Stage

At thirty percent stage most of the important project decisions have been established and the opportunity to effect the project design is somewhat limited. At this stage there is the opportunity to consider any significant design issues that have been identified during the design development. In addition, the constructibility, construction sequencing, staging, and traffic control elements are important to consider at this stage.

The VE study should be a tool to *advance* the project in the development process. Selecting the project at the proper stage of development and the timing of the study are very important to the success of the VE program.

TEAM LEADER

The quality of the VE study is a direct result of the ability of the Team Leader. This individual will guide the team in its efforts and be responsible for its actions during the

study. The Team Leader should be knowledgeable and proficient in both transportation design/construction and the VE process for transportation projects.

Team leadership can be supplied from within the region, or from other Regions, divisions of the Olympia Service Center, consultants, or other qualified leaders outside of the Department. The State VE Program Manager will cooperate with the Regional VE Coordinator to select the team leader. The State VE Program Manager will maintain a statewide pool of qualified team leaders.

TEAM MEMBERS

The VE team is usually comprised of five to eight persons with diverse backgrounds relevant to the specific study. The team may be selected from the Regions, Olympia Service Center, other state or Federal agencies, or private individuals or firms. Team members should have the appropriate expertise to address the major functional areas and critical high cost issues of the study, and must be committed to the time required for the study. For best results the team members should have received VE training prior to participation on a VE study. Local agencies, other state agencies, and communities groups should be invited to participate as team members on a case by case basis depending on project issues.

VE STUDY REQUIREMENTS

The time required to conduct a VE study may vary depending on the complexity and size of the project, but typically will range from three to five days.

The VE study Final Report and Workbook should include a narrative description of project input information, background and history, constraints and drivers, VE team focus areas, and a discussion of the team speculation, evaluation, and recommendations. All of the team's evaluation documentation including sketches, calculations, analysis, and rationale for recommendations must be included in the Workbook as part of the Final Report. The Regional VE Coordinator will specify the number of copies of the Final Report and Workbook.

IMPLEMENTATION OF VE RECOMMENDATIONS

VE Team's recommendations will be included in the Final Report and Workbook. Upon receipt of the findings and recommendations from the team, the Regional Managers will review and evaluate the recommendations. A specific response will be developed for each of the VE Team recommendations and prepare a summary statement regarding the decisions for the further project development.

This VE Decision Document will be submitted to the State Design Engineer. The document will become a vital element in the decision record for the project. Project development will then continue based on the decisions developed from the preliminary

engineering and the VE study recommendations (barring participation agreements funded by other agencies, utilities, developers, and so forth).