



**STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION**

**ROADWAY DESIGN DIVISION**  
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**INSTRUCTIONAL BULLETIN NO. 16-01**

**Value Engineering (VE) Policies and Procedures**

**Effective immediately**, section 1-300.00, is added to the Guidelines

**PURPOSE:** Document the Value Engineering Office's policies and procedures pertaining to value engineering analysis for projects under development.

**1-300.00 Value Engineering**

Value Engineering is a systematic independent multidisciplinary team review process which utilizes project functional analysis to develop recommendations that:

- Optimize the value and quality of the project.
- Provide the needed functions, considering community and environmental commitments, safety, reliability, efficiency, and overall life-cycle cost.
- Reduce the time to develop and deliver the project.

**1-310.00 Value Engineering Office Responsibilities**

The Tennessee Department of Transportation (TDOT) has established a VE Program in accordance with 23 CFR Part 627. TDOT shall designate a VE Program Coordinator, hereinafter referred to as the "Coordinator", to promote and advance VE program activities. The program is administered by the Roadway Design Division's VE Office. The responsibilities of the VE Office include the following:

- Monitor PPRM and coordinate with TDOT Program Development and Administration to identify projects that meet the project selection criteria.
- Ensure that VE analyses are conducted on all applicable projects.
- Coordinate all VE training requirements.

- Provide a list of current and potential VE projects on a quarterly basis to the FHWA.
- Provide an annual report to FHWA summarizing the results of the VE analyses.
- Coordinate with HQ Construction Office to fulfill any Program Performance Data requested by FHWA.

### **1-320.00 Value Engineering Project Selection Policy**

A VE analysis shall be conducted as early as practicable on all applicable projects developed by TDOT and Local Agencies that utilize federal-aid highway funding.

Applicable projects requiring VE analysis include the following:

- a) Projects that are located on the National Highway System (NHS), utilize federal-aid highway funding, and have an estimated total project cost greater than or equal to \$50 million.
- b) Bridge projects that are located on the NHS, utilize federal-aid highway funding, and have an estimated total project cost greater than or equal to \$40 million.
- c) Any major project (as defined in 23 U.S.C. 106(h)) that is located on or off of the NHS and utilizes Federal-aid highway funding in any contract or phase comprising the major project.
- d) Any project for which a VE analysis has not been conducted and a change is made to the project's scope or design between the final design and the construction letting that results in an increase in the project's total cost such that it meets the thresholds identified in bullets a), b), or c) above.
- e) Any other project which utilizes federal-aid highway program funding that FHWA determines to be appropriate. Design Build Projects do not require a VE analysis, but CM/GC projects do require a VE analysis if it meets the thresholds identified in bullets a), b), or c) above.

The total project cost is defined as the estimated costs of all work to be conducted on a project including the environmental, design, right-of-way, utilities and construction phases. A bridge project is defined as any project whose primary purpose is to construct, reconstruct, rehabilitate, resurface, or restore a bridge. For projects split into smaller sections for development, the termini used in the environmental document shall control and be used for determining threshold requirements.

TDOT and Local Agencies may elect, on a case by case basis, to conduct a VE analysis on other complex projects if there is a potential to realize benefits from the analysis. Design managers and division heads are encouraged to notify the Coordinator of any projects that they think have the potential to benefit from a VE analysis.

## **1-330.00 Value Engineering Analysis Procedures**

### **1-330.10 Identifying and Scheduling VE Analyses**

The Coordinator shall determine when the VE analysis will take place. The VE analysis should be conducted as early as practicable during the project development. In most cases, the VE analysis should be scheduled prior to right-of-way field review.

When a project has been identified as a candidate for VE analysis, the Coordinator shall notify the Roadway Design Manager. The Roadway Design Manager shall then notify the Coordinator of any changes made to the project scope during the project development.

### **1-330.20 Assembling the VE Analysis Team**

The Coordinator shall select a multidisciplinary team composed of individuals who are not directly involved in the project's planning or design. The team should include members from key project disciplines such as Roadway, Structures, Environmental, Geotech, Construction, Hydraulics, Materials and Test, Traffic Operations, Strategic Transportation Investments, and Quality Assurance/ Quality Control.

The Coordinator will select the team leader and they will work together during the planning and scheduling of the VE analysis. The team leader will guide team during the project analysis and the Coordinator shall oversee the team's progress to ensure that the VE analysis process, as defined in 23 CFR Part 627.3, is followed.

### **1-330.30 VE Job Plan**

The VE team analysis shall follow the VE Job Plan, which consists of seven phases as defined in 23 CFR Part 627.3(f). Prior to the beginning of the VE team analysis the Coordinator will scale the level of analysis conducted and effort expended for each phase to meet the needs of each individual project and convey this plan of analysis to the team leader.

#### **Analyze Project Functions:**

1. Information Phase: Review project information, including commitments and constraints, and identify and define the current project conditions and overall analysis goals.
2. Function Analysis Phase: Analyze the project information to understand the required functions of the project and define each required function using a two-word active verb/ measurable noun technique.

### **Generate Alternatives:**

3. Creative Phase: Generate ideas to identify other ways to accomplish the required functions which improve the project's performance, enhance its quality, and/or lower its costs.
4. Evaluation Phase: Evaluate advantages and disadvantages for each design alternative, including life-cycle costs, and the need for additional environmental studies. Select feasible ideas for development.

### **Act on Recommendations:**

5. Development Phase: Develop each selected alternative, including environmental, technical and cost supporting data, into fully supported recommendations.
6. Presentation Phase: Present the VE recommendations to TDOT management and/or the Roadway Design Manager.
7. Resolution Phase: The Coordinator will evaluate, document, and ensure implementation of all approved VE recommendations.

### **1-330.40 Presentation of Recommendations**

The Coordinator and team leader will work together to create a VE Recommendations Report which includes analysis and cost information for each recommendation. The total estimated VE cost saving for all recommendations will determine how the recommendations are presented.

- For savings totaling \$1 million or less, the VE Recommendations Report will be presented to the Roadway Design Manager and/or PDD for their evaluation and response.
- For savings totaling more than \$1 million, a team member presentation of all recommendations will be made to TDOT management. The VE Recommendation Report will be available for all presentation attendees. A copy of the VE Recommendations Report shall be given to the Roadway Design Manager for their evaluation and response prior to the presentation.

The Coordinator will request a written response to each recommendation from the Roadway Design Manager. This written response shall explain whether or not the recommendation is found feasible to implement. When there is a team presentation to TDOT Management, the Roadway Design Manager's response shall also include any discussions and/or decisions made during the presentation.

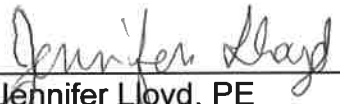
### **1-340.00 VE Workbook**

After the response to all VE recommendations has been received from TDOT Management, the Coordinator shall assemble the VE Workbook. This Workbook shall include all Job Plan forms and all correspondence with TDOT Management. The

Coordinator shall distribute the completed VE Workbook to the Roadway Design Manager and forward the VE workbook to the FHWA office. A copy shall be retained by the VE Office for at least 3 years after the final acceptance of construction.

### **1-350.00 Implementation of Approved Recommendations**

The Coordinator shall oversee the implementation of all accepted VE recommendations. The Roadway Design Manager shall be responsible for incorporating all accepted VE recommendations into the project prior to finalizing the construction plans. If the Roadway Design Manager determines that any accepted VE recommendation is no longer acceptable, he/she shall notify the Coordinator and provide, in writing, the reason(s) for the changes. These changes shall be evaluated to determine if any additional action can be taken to modify the recommendation. The Coordinator shall review the final construction plans to ensure all accepted VE recommendations have been implemented.

  
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