



U.S. DEPARTMENT OF
TRANSPORTATION

**Federal Highway
Administration**

Order

Subject

FHWA Value Engineering Policy

Classification Code	Date	OPI
1311.1A	May 25, 2010	HIPA-20

Par.

1. What is the purpose of this directive?
 2. Does this directive cancel an existing FHWA directive?
 3. What authorities govern this directive?
 4. What definitions are used in this directive?
 5. When does the FHWA require a VE analysis?
 6. When should a VE analysis be conducted?
 7. What characteristics need to be incorporated in the VE analysis process?
 8. How may consultants be used to conduct VE analyses?
 9. What are the FHWA responsibilities?
 10. What are the State DOT responsibilities?
 11. What are the reporting procedures?
 12. Where can I find additional information?
-
1. **What is the purpose of this directive?** This directive provides policy direction on the integration of Value Engineering (VE) in the Federal-aid highway program (FAHP).
 2. **Does this directive cancel an existing FHWA directive?** Yes. This directive cancels Federal-aid Policy Guide (FAPG) non-regulatory non-Code of Federal Regulations (CFR) related guidance, G 6011.9, Chapter 6, Value Engineering, issued via Transmittal 24, on September 8, 1998.
 3. **What authorities govern this directive?**
 - a. Title 23, United States Code (U.S.C.), Sections 106(e)(2) and (3), and Title 23, Code of Federal Regulations (CFR), Part 627, specify when a State department of transportation (DOT) or public authority (as defined by Title 23 U.S.C., Section 101(a)(23)) shall conduct a

VE analysis or cost reduction analysis on projects that may utilize FAHP funding, as described in Paragraph 5.

- b. Paragraph 6b(2) of DOT Order 1395.1A, DOT Value Engineering Program, dated May 8, 1992, provides the following: "Each DOT Operating Administration should strongly encourage the use of VE in its grant awards or Federally assisted programs for major transportation projects throughout the planning, design and/or construction phases. This may include the use of VE proposals as a result of VE studies/analyses as well as VE incentive clauses in construction contracts."
- c. Paragraph 9 of the Office of Management and Budget's (OMB's) Value Engineering Circular A-131, dated May 21, 1993, provides the following: "Each agency shall report Fiscal Year results of using VE annually to OMB, except those agencies whose total budget is under \$10 million or whose total procurement obligations do not exceed \$10 million in a given fiscal year." The Circular also describes what VE data must be submitted and the format for submitting the data to OMB.

4. **What definitions are used in this directive?**

- a. **Life-cycle cost.** The total cost of a project or item over its useful life. This includes all of the relevant costs that occur throughout life of a project or item, including initial acquisition costs (such as right-of-way, planning, design, and construction), operation, maintenance, modification, replacement, demolition, financing, taxes, disposal, and salvage value as applicable.
- b. **Major Project.** A project receiving Federal financial assistance 1) with an estimated cost of \$500 million or more, or 2) that has been identified by the Secretary as being "Major" as a result of special interest.
- c. **Project.** A portion of a highway that a State or public authority proposes to construct, reconstruct, or improve as described in the preliminary design report or applicable environmental document. A project may consist of several contracts or phases over several years.
- d. **Product or service.** Any element of a project from concept through maintenance and operation. In all instances, the required function

should be achieved at the lowest life-cycle cost based on requirements for performance, maintainability, safety, and esthetics.

- e. **Value Engineering analysis.** A systematic process of review and analysis of a project, during the concept and design phases, by a multidiscipline team of persons not involved in the project, that is conducted to provide recommendations for:
 - (1) providing the needed functions safely, reliably, efficiently, and at the lowest overall cost;
 - (2) improving the value and quality of the project; and
 - (3) reducing the time to complete the project.

- f. **Value Engineering Job Plan.** A systematic and organized plan of action for conducting a VE analysis and assuring the implementation of the recommendations. The methodology utilized for any VE analysis shall follow widely recognized systematic problem-solving procedures that are used throughout private industry and governmental agencies.
 - (1) After project selection, the Job Plan consists of the following phases that are conducted during a VE analysis:
 - (a) Gather information;
 - (b) Analyze functions, worth, cost, performance and quality;
 - (c) Speculate using creative techniques to identify alternatives that can provide the required functions;
 - (d) Evaluate the best and lowest life-cycle cost alternatives;
 - (e) Develop alternatives into fully supported recommendations; and
 - (f) Present VE recommendations for review, approval, reporting, and implementation.
 - (2) Post-analysis Job Plan activities include the implementation and evaluation of the outcomes of the approved recommendations. These post-analysis phases are

conducted in accordance with the policies stated in the State DOTs VE program as described in Paragraph 9a.

- g. **Value Engineering Change Proposal (VECP) clause.** A construction contract provision which encourages the contractor to propose changes in the project's plans, designs, specifications, or contract documents that would lower the project's life-cycle cost to the owner agency, or improves the value and/or quality of the project with no increase, or a slight increase in cost of the project. The net savings of each proposal is usually shared with the contractor at a stated reasonable rate.

5. **When does the FHWA require a VE analysis?**

- a. The FHWA requires a VE analysis on:
 - (1) each project on the Federal-aid system with an estimated cost (which includes project development, design, right-of-way, and construction costs) of \$25 million or more that uses FAHP funding;
 - (2) each bridge project located on or off of the Federal-aid system with an estimated total cost of \$20 million or more that uses FAHP funding; and
 - (3) any other Federal-aid projects the Secretary determines to be appropriate.
- b. In addition to all projects described in Paragraph 5a, the FHWA strongly encourages State DOTs or public authorities to conduct the VE analysis on other projects where there is a high potential for cost savings in comparison to the cost of the VE analysis, or the potential exists to improve the projects' performance or quality. Projects involving complex technical issues, challenging project constraints, unique requirements, and competing community and stakeholder objectives offer opportunities for improved value by conducting VE analyses.
- c. Any use of FAHP funding on a Major Project requires that a VE analysis be conducted, regardless of the amount of FAHP funding that may be used on the project. The FHWA may require that a State DOT or public authority perform more than 1 VE analysis for a Major Project.

- d. The threshold for applicable projects was amended in Safe Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) to include the projects noted in this paragraph. Since the VE regulations in 23 CFR 627 have not yet been updated to reflect this change, the statutory requirements control to the extent there are conflicts between the regulations and the statute.
- e. A VE analysis is required if the established scope and estimate of the project costs in the preliminary design report or environmental document meets the criteria noted in Paragraph 5a. After completing the required VE analysis at this stage in the project development process, if the project is subsequently split into smaller projects in final design or is programmed to be completed by the letting of multiple construction contracts, an additional VE analysis is not required. However, splitting a project into smaller projects or multiple construction contracts is not an accepted method to avoid the requirements of having to conduct a VE analysis.
- f. The FHWA may require a VE analysis to be conducted if a State DOT or public authority encounters instances when the design of a project has been completed but the project does not immediately proceed to construction. In accordance with Paragraph 5a(3):
 - (1) If a project that met the criteria identified in Paragraph 5a encountered a 3 year delay or longer prior to advancing to a letting for construction, and a substantial change to the project's scope or design is identified when the required re-evaluation of the environmental document is performed, the FHWA may encourage or require a new VE analysis or an update to the previously completed VE analysis to be conducted; or
 - (2) If a project's estimated cost initially fell below the criteria identified in Paragraph 5a but the project advances to a letting for construction, and a substantial change occurs to the project's scope or design is determined to be the basis for an increase in the project cost above the criteria identified in Paragraph 5a when the required re-evaluation of the environmental document is performed, the FHWA will require a VE analysis to be conducted.
- g. When the design of a project has been completed but the project does not immediately proceed to construction, the requirement to conduct a VE analysis is considered to be satisfied, or not necessary, if:

- (1) A project met the criteria identified in Paragraph 5a and had a VE analysis conducted, and the project advances to a letting for construction without needing any substantial changes in its scope or its design; or
- (2) A project's estimated cost initially fell below the criteria identified in Paragraph 5a, but when advancing to letting for construction, falls above the criteria due to inflation, standard escalation of costs, or minor modifications to the projects design or contract.

6. **When should a VE analysis be conducted?**

- a. The State DOTs VE program, policies and procedures should provide for the identification of which projects will be subject to a VE analysis early in the process to develop the State's multi-year Statewide Transportation Improvement Program.
- b. For maximum benefit, VE analysis should be conducted as early as practicable in the planning or design phase of a project, preferably before the completion of preliminary (30-35%) design. The VE analysis should be closely coordinated with other project development activities, to enable proposed VE recommendations to be accepted and incorporated into the project design without conflicting with or adversely impacting previous agency or project commitments, the project's development, or construction schedule.
- c. Design-build projects meeting the requirements described in Paragraph 5a of this directive, the VE analysis shall occur prior to the release of the Request for Proposals document (as specified in 23 CFR 627.5(e)).

7. **What characteristics need to be incorporated in the VE analysis process?** To satisfy the requirement to conduct a VE analysis (as specified in 23 U.S.C. 106(e) and 23 CFR 627), the analysis process will incorporate each of the following characteristics:

- a. the use of a multi-disciplinary team of individuals not directly involved in the planning or design of the project, with at least one individual who is trained and knowledgeable in VE techniques and able to serve as the team's facilitator and coordinator;
- b. the systematic application of the VE Job Plan described in Paragraph 4(f) of this directive;

- c. the production of a formal written report outlining at a minimum:
 - (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 stages of the VE Job Plan which would include documentation of the life-cycle costs that were analyzed;
 - (5) summarization of the analysis conducted;
 - (6) documentation of the proposed recommendations and approvals received at the time the report is finalized;
 - (7) documentation of the proposed and approved recommendations, and related information to support the State DOTs and FHWA's VE program monitoring and reporting;
 - (8) the formal written report shall be retained for at least 3 years after the completion of the project (as specified in 49 CFR 18.42); and
- d. for bridge projects, the VE Analyses must:
 - (1) include bridge substructure and superstructure requirements based on construction material;
 - (2) be evaluated based on:
 - (a) an engineering and economic bases, taking into consideration acceptable designs for bridges;
 - (b) analysis of life-cycle costs and duration of project construction.

8. **How may consultants be used to conduct VE analyses?** State DOTs may employ qualified VE consultants to conduct VE analyses. Consulting firms should not conduct a VE analysis on projects (as specified in Paragraph 5) where they have an interest in the project. It is strongly recommended that consultants be qualified VE practitioners, experienced in performing and leading VE studies (have participated in several VE studies

as a team member and as a team leader), and have sufficient VE training, education, and experience to be recognized by SAVE International as meeting the requirements for certification.

9. **What are the FHWA responsibilities?**

a. **Federal-aid Division Offices**

- (1) Ensure that copies of this directive are provided to the State DOTs.
- (2) Designate and develop roles and responsibilities for a Division Office VE coordinator.
- (3) Encourage the State DOTs to host VE training provided by the FHWA, a qualified VE consultant, and/or develop their own VE training.
- (4) Participate in VE analyses, the review of VE recommendations, and other activities of the State DOT VE programs to the extent practicable, and as detailed in the Office's Stewardship & Oversight agreement and/or standard operating procedures.
- (5) Ensure all applicable projects receive a VE analysis and encourage the State DOTs to conduct a VE analysis on other projects that would benefit such an analysis.
- (6) Ensure the State DOTs have VE programs that fulfill the requirements of Paragraph 5a of this directive, and support in the development and conduct of their programs.
- (7) Encourage the State DOTs to include a VECP clause in their construction contracts.
- (8) Summarize the State DOTs VE program accomplishments and VE studies conducted annually and provide this information to the FHWA VE Program Manager as specified in Paragraph 11a of this directive.

b. **Federal Lands Highway Divisions**

- (1) Follow the VE guidance established in Subsection 2-E of the Federal Lands Highway Manual.

- (2) Summarize the Federal Lands Highway Program's VE accomplishments and VE studies conducted annually, and provide this information to the FHWA VE Program Manager as specified in Paragraph 11a of this directive.

c. **FHWA VE Program Manager**

- (1) Promotes VE and serves as the technical expert on VE matters for FHWA, State DOTs, and public authorities.
- (2) Provides VE briefings to FHWA, State DOT, and local executives and upper management.
- (3) Encourages VE training, sharing of technical expertise, and successful practices among FHWA, State DOTs, and public authorities, and assists State DOTs develop VE programs.
- (4) Coordinates VE with other FHWA activities and initiatives aimed at cost reduction or project performance improvement.
- (5) Compiles VE data received from the FHWA Federal-aid and Federal Lands Division Offices and prepares an annual accomplishment report for the DOT as specified in Paragraph 11b of this directive.
- (6) Represents FHWA in VE forums with the DOT and other Federal and State government agencies and industry organizations.
- (7) Serves as FHWA's representative to the American Association of State Highway and Transportation Officials (AASHTO) VE Technical Committee.

10. **What are the State DOT responsibilities?**

- a. As directed in 23 CFR 627.5, each State DOT must establish and sustain a VE program. Generally, an acceptable VE program is one that:
 - (1) assigns an individual that is knowledgeable in VE with the responsibility to coordinate and monitor the program;
 - (2) establishes and documents VE program policies and procedures;
 - (3) includes a training program or initiative that ensures the State DOT has individuals who are capable of facilitating or

participating in a VE analysis that may be conducted in the planning or project development process;

- (4) ensures all applicable projects noted in Paragraph 5a of this directive will receive a VE analysis, including analyses for applicable projects being administered by Public authorities;
 - (5) provides for the timely review, final disposition, implementation, and documentation of the VE analysis recommendations and VECPs;
 - (6) tracks all VE analyses that are conducted and VE recommendations and VECPs that are implemented; and
 - (7) monitors, analyzes and disseminates the results of all VE analyses conducted, VECPs implemented, and VE program performance.
- b. The State DOTs VE program, policies and procedures should provide for the identification of which projects will be subject to a VE analysis early in the process to develop the State's multi-year Statewide Transportation Improvement Program.
- c. The State DOTs are encouraged to include a VECP clause in their construction contracts enabling contractors to propose changes in contract requirements which will reduce project cost(s) or improve value or service at no increase or a minor increase in cost.
- (1) The net savings of each proposal should be shared with the contractor at a stated reasonable rate. Reimbursement for such share is eligible for pro-rata reimbursement with Federal-aid funds.
 - (2) States should retain the right to accept or reject all proposals and acquire all rights to use accepted VECPs when preparing plans, specifications and estimates on future projects without restriction.

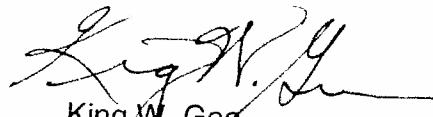
11. **What are the reporting procedures?**

- a. The results of all of the VE analyses and VECP that are conducted on projects that use FAHP funding or are administered by the Federal Lands Highway Divisions shall be used to prepare an Annual VE Accomplishment Report. At the end of the fiscal year, the FHWA VE Program Manager will issue the call for information for the accomplishment report to each Federal-aid and Federal Lands

Highway Division Office. The call for information will include the format required for submitting the VE data to the FHWA VE Program Manager.

- b. The FHWA VE Program Manager shall prepare the Annual VE Accomplishment Report including an assessment of the effectiveness of efforts to encourage VE on Federal-aid and Federal Lands Highway projects. The FHWA VE Program Manager will submit the Annual Accomplishment Report to the DOT Acquisition Oversight Division and post results on the FHWA's VE Web site.

12. **Where can I find additional information?** Additional information about this policy and FHWA's VE program is available at <http://www.fhwa.dot.gov/ve>, or by contacting FHWA's Office of Infrastructure Pre-Construction Team (HIPA-20).


King W. Gee
Associate Administrator
for Infrastructure

