

Mississippi Department of Transportation

Value Engineering Procedure

May 22, 2018

The Mississippi Department of Transportation (MDOT) Value Engineering (VE) Program supports the MDOT mission to provide a safe intermodal transportation network that is planned, designed, constructed and maintained in an effective, cost efficient, and environmentally sensitive manner. Thus the major considerations of the Program include, but are not limited to: 1) Improving the value and quality of the project, and 2) Reducing the time to complete the project, and 3) Ensuring that the original purpose for the project is accomplished.

The Value Engineering Program will be administered by the Value Engineering Coordinator who is appointed by the Roadway Design Engineer. The main duties of the Coordinator are to identify projects that fall within the required criteria for performing a VE Analysis, to establish a VE team of multi-disciplinary professionals familiar with the VE process but not involved in the project, to provide all necessary information and facilities for the VE Team, and to schedule the VE Analysis. The Coordinator will also distribute all reports and related decisions to all personnel with roles and responsibilities pertinent to the respective project's VE analysis. The Value Engineering Coordinator will assist in developing a decision memo after the VE Team has completed its VE Analysis. The decision memo will address all recommendations in the VE Team's report and will be incorporated into the final VE report.

As required by 23 USC 106 and 23 CFR 627, a value engineering analysis will be performed on all federally funded projects on the National Highway System (NHS) whose combined environmental, design, ROW, utilities and construction costs based on the termini provided in the environmental document have a total estimated cost of \$50 million or more. Likewise a Federal-aid bridge project on the NHS will require a VE analysis if the estimated total project cost is \$40 million or more. Although projects delivered using the design-build method of construction will not require a VE analysis, such analysis should be considered. Projects with delivery methods other than the design-build method of contracting will require a VE analysis if the project is within the above listed monetary thresholds. A VE analysis will be conducted on all major projects (\$500 million or greater), whether they are on the NHS or not. Also MDOT will perform a VE analysis on any project that the Federal Highway Administration (FHWA) or MDOT determines a VE analysis is deemed necessary or on a project for which the development and delivery would benefit. If an environmental document includes more than one construction project and VE thresholds are met, a value engineering analysis will be performed on all the construction projects either combined into one VE analysis or analyzed individually. The VE analysis will be conducted prior to final design. Desirably, most projects will be studied after conceptual plans are produced which is normally at 30% design. Value engineering requirements are tracked in the Project Development/Project Management (PDPM) database. The need for an analysis will be re-evaluated at every district PDPM meeting using the most recent cost estimate.

MDOT's Project Development Manual (PDM) for Local Public Agencies (LPA), LPA PDM, includes information on the MDOT LPA Division VE roles and responsibilities on LPA projects in Section 1.5. For further questions the State LPA Engineer can be contacted at (601) 359-7675. The LPA Division and the Office of State Aid (OSARC) are responsible for identifying and conducting VE analyses on respective Federal-aid LPA and OSARC projects on the NHS that meet VE thresholds. If an OSARC project requires a VE analysis, the County will be responsible for conducting the VE analysis. MDOT'S LPA Division and OSARC shall submit the Final VE Report of any Value Engineering analysis to the MDOT Value Engineering Coordinator for inclusion in the Annual VE Program Performance Report submitted to the FHWA Division Office.

Most VE analyses will be conducted by teams whose members are all provided by consultants. This multidisciplinary team will consist of individuals not directly involved with the planning or design of the project, with at least one individual who has training and experience with leading VE analyses. This individual is usually the Team Leader or Manager. The Team Leader or Manager must also be licensed as a Professional Engineer registered in the State of Mississippi. This multidisciplinary team will typically have between four and six members and will consist of individuals with experience in the various aspects of the project being analyzed, such as roadway design, structures, traffic, soils, hydraulics, and construction. The duration of a typical MDOT VE analysis will normally be four to five days. This time frame may vary depending on the nature of the project.

For MDOT VE analyses the following stakeholders, or as appropriate, shall be invited to the VE study kick-off meeting and concluding presentation:

- Assistant Chief Engineer – Preconstruction
- Assistant Chief Engineer – Operations
- Assistant Chief Engineer – Field Operations
- District Engineer
- Assistant District Engineer – Preconstruction
- Assistant District Engineer - Construction
- Roadway Design Division Engineer
- Assistant Roadway Design Division Engineer
- Roadway Design Division Section Engineer
- Bridge Division Engineer
- Assistant Bridge Division Engineer
- Bridge Division Section Engineer
- Materials Division Engineer
- Construction Division Engineer
- Construction Division Area Engineer
- State Estimator
- Traffic Division Engineer
- Traffic Division Area Engineer
- Environmental Division Director
- Environmental Division Area Engineer
- Right-of-Way Division Director
- District ROW Coordinator
- Planning Division Engineer
- Hydraulics Division Engineer

- Assistant Hydraulics Division Engineer
- FHWA Field Operations Engineer
- FHWA Transportation Engineer
- Design Consultant (if applicable)

VE Analysis

Normally each analysis will begin with a kick-off meeting where designers and District personnel make a presentation of the project's scope, history, and challenges to the VE team, the MDOT stakeholders, and FHWA. The presentation should include any restraints the VE team needs to be aware of, including Environmental Commitments, and any design and construction concerns. The VE team will visit the project site accompanied by a District representative familiar with the project. The VE team will conduct the VE analysis using the VE Job Plan. The VE Job Plan shall include and document the following seven phases: 1) Information Phase which will allow the team to gather project information including project commitments and constraints, 2) Function Analysis Phase which will allow the team to understand the required functions, 3) Creative Phase which will allow the team to generate ideas on ways to accomplish the required functions which improve the project's performance, enhance its quality, and lower project costs, 4) Evaluation Phase which will allow the team to evaluate and select feasible ideas for development, 5) Development Phase which will allow the team to develop the selected alternatives into fully supported recommendations, 6) Presentation Phase which will allow the team to present the VE recommendations to the project stakeholders, and 7) Resolution Phase which will allow the team to evaluate, resolve, document and implement all approved or rejected recommendations which will come from the approved decision memo and incorporated into the final report.

In addition to the above, VE analysis of bridge projects will include bridge substructure and superstructure including alternative construction materials and innovative construction technique considerations. Analysis of bridge projects will be conducted based on an engineering and economic assessment, taking into consideration acceptable designs for bridges, and an analysis of life-cycle costs and duration of project construction. The team will present their recommendations to the MDOT stakeholders and FHWA during the presentation phase.

Post-Analysis

Upon conclusion of the final presentation, pertinent MDOT officials, the VE coordinator, and any tasked design consultant, will meet to discuss the VE recommendations including any proposed alternatives. At the closing of this decision meeting, all information necessary to formulate a decision memo should be provided. There may be instances where additional information is needed that could not be provided during the analysis that may delay the completion of the decision memo. The VE Coordinator will finalize the memo for approval signature by the Roadway Design Engineer and Assistant Chief Engineer – Preconstruction. The memo will be sent to the VE Team Leader or Manager for inclusion in the final VE Report. The VE team must submit a draft report within two weeks of the decision memo receipt. The report will include: 1) project information, 2) a VE team members list, 3) background and supporting information, 4) documentation supporting each VE Job Plan phase including any life-cycle cost analysis, 5) The VE analysis summary, and 6) documented recommendations. The VE Coordinator will review the VE report and provide final comments to the VE Team Leader or Manager for incorporation and release of the final VE report. The final VE report including the decision memo will be distributed by the VE

Team Leader or Manager to all stakeholders electronically; two printed copies will also be sent to the VE Coordinator. The VE Coordinator will save an electronic copy in ProjectWise, send one physical copy to Roadway Design Division files, and send one copy to FHWA.

Roadway Design Section Engineers will be responsible for incorporating the accepted recommendations into the project plans. The final VE Report and decision memo and the recommendations therein will be reviewed and fully incorporated at the field plan reviews and office plan reviews. Copies of the VE Report and implementation actions being undertaken are to be documented within the field review and office review reports.

Construction Value Engineering Change Proposals

For Federal-aid construction projects in which the contractor's Value Engineering Change Proposal (VECP) is accepted under Subsection 104.08 of the respective MDOT or OSARC Standard Specifications, the MDOT Construction Division (for MDOT projects), the LPA Division (for LPA projects), or the Office of State Aid Road Construction (for OSARC projects) will be responsible for reporting accepted VECPs to the VE Coordinator for inclusion in the Annual VE Program Performance Report. The VE Coordinator will collect information from VE Studies on the above described design projects as well as the VECPs on Federal-aid construction projects for inclusion in the annual report.

Retention of VE Reports

Value Engineering reports are to be retained within project files for at least three years after the completion of the project(s).

Training

The VE Coordinator will use available webinars from FHWA, other private or governmental entities, and from other State DOTs that specifically teach VE methods of analysis, provide insight on the VE regulations or provide case studies, all consistent with policy guidance. Speakers who are experts in the VE process may be invited to discuss various VE topics for training events. MDOT will provide training on value engineering concepts to MDOT personnel periodically. A sign-in sheet will be used and saved for future reference.

Annual VE Program Performance Report

The VE coordinator will provide an annual report to FHWA for each federal fiscal year (1st of October through September 30th). The report will follow the required reporting format as provided to the MDOT VE Coordinator by FHWA. Information from VE analysis for design projects as well as VECP on construction projects for the fiscal year are to be included in the report. Any MDOT VE training throughout the year and a schedule of analyses planned for the next two years will also be included in the report.