Chapter 16
Preliminary Field Review and Scope of Work Approval

16.1 General Discussion

On all Federal-aid funded transportation projects, local agencies must submit a report documenting the intended scope of the project and receive approval from MDT or FHWA prior to beginning the preparation of plans, specifications, and estimates (PS&E). For the majority of projects the Project Proposal will serve as the preliminary field review report.

For complex projects a preliminary field review should be considered to determine project-related issues and major design features. The review should be attended by representatives from the local agency, MDT, the FHWA and focus groups as appropriate. A Preliminary Field Review (PFR) worksheet that summarizes the items to be addressed at the review and a format for the report are provided in the Appendix 16.7.4.

Local agencies must submit a Scope of Work Report and receive approval from the MDT or FHWA prior to the preparation of final plans, specifications, and estimates (PS&E). The Scope of Work Report identifies the major project issues and objectives, as well as how they will be addressed in the development of the project. It also includes a discussion of alternatives and the basis for the selection of the alternative that will be utilized. The report also provides an overview of the project's major design features. The project design will proceed as described in the report unless opposition is expressed within the specified comment period. Any disagreement in the scope of the project must be resolved before final approval of the report.

A project's Scope of Work will not be approved until the project's environmental document has been approved by FHWA, and/or MDT and its public involvement requirements have been met.

When there is a subsequent change to the project design or scope, an amended scope of work approval is required.

16.2 Requirements for Scope of Work Approval

The items listed below are typically required for Scope of Work approval. The list is not all-inclusive, and all of the areas listed will not be required on every project. The level of coverage for each item will also vary from project to project. Additional information is also available in chapter 3 of the MDT Road Design Manual. Examples of Scope of Work Reports and assistance in preparing them may be obtained from the LAG Certification Liaison.

16.2.1 Traffic Data

Design-year ADT, Design Hourly Volume (DHV), percentage of commercial truck traffic, and the average daily traffic forecast during the design year should be included. The design year may be any point within 8 to 20 years from the projected completion of construction.

Crash Data. Number and type of crashes. Locations of unexpectedly high numbers of crashes. A brief discussion of why a higher than normal number of crashes may be occurring and proposed countermeasures.

16.2.2 Right-of-Way

Refer to Chapter 11, Right-of-Way Procedures.

Utilities. Summarize the utility conflicts on the project and any potential problems relative to railroads.

16.2.3 Design Speed
Basis for selection of the design speed. If more than one design speed is selected for the project, the termini for each design speed selected must be clearly identified.

16.2.4 Horizontal-Vertical Alignment
A discussion of the proposed horizontal alignment, existing streets, and proposed intersections will be included. A brief explanation of features that do not meet the project design criteria. Provide only sufficient detail to generally portray the characteristics of the alignment. If there is little change in the vertical alignment note the major features, stopping sight distance and vertical controls, such as existing structures and railroad crossings. If there is significant change, include a discussion of the existing and recommended vertical alignments. Provide a brief discussion of the need for the changes and the anticipated impacts associated with the changes.

16.2.5 Roadway Section
Provide typical roadway sections for each general type of roadway in the project. This is not required on signal projects if the lane description has been shown.

16.2.6 Pavement Design Criteria
Rationale for selection of the pavement type and depth of surfacing. The local agency should contact the MDT Surfacing Design Unit through the LAG Certification Liaison to obtain the most current surfacing design guidelines.

Grading. Discuss the grading that will be needed on the project, special excavation (street excavation, muck excavation), the need for large amounts of borrow, special soils requirements, the need for disposal of large amounts of excavated material.

16.2.7 Hydraulics
Provide a brief summary of the proposed treatment for the hydraulic elements on the project. These may include storm drain systems, culvert replacements, irrigation facilities, and designs of facilities within the delineated floodplains.

16.2.8 Traffic
Provide a brief summary of the traffic-related issues and how they will be addressed. The summary should include intersection improvements, turn lanes, auxiliary lanes, parking requirements, and any traffic control devices (signals, lighting, signing, and pavement markings).

16.2.9 Bike/Pedestrian Features
Briefly summarize the bicycle and pedestrian features that will be incorporated into the project, including bike lanes, sidewalks, and ADA accessibility requirements.

16.2.10 Design Exceptions
Identify and briefly summarize any approved design exceptions.

16.2.11 Traffic Control
Provide a discussion on the proposed traffic control strategy. This may include the need for detours, road or lane closures, traffic shifts, construction limitations, sequencing issues, etc.

16.2.12 Geotechnical Considerations
Identify geotechnical or subsurface problems and any techniques that will be used to address these concerns.

16.2.13 Cost Estimate
The costs submitted must be included for the Project Proposal and the Local Agency Agreement will be used.

16.2.14 Environmental Considerations
Documentation, including resources present, potential social, economic, and environmental impacts and avoidance and mitigation measures.

16.2.15 Public Involvement
Reviewing the above documentation, the local agency will determine whether the design is in conformance with all requirements. Demonstrate that the design is in conformance, the necessary environmental actions (Chapter 9) have been completed and approved by FHWA, and if public involvement requirements have been met.

16.2.16 Permits
Refer to Chapter 10, Federal Environmental Process, and Appendix 16.74 for a sample list of permits that may be required.

16.3 Bridge Design Policy
The local agency will coordinate all work with MDT Bridge Bureau.

16.4 Value Engineering
Value Engineering may be applicable to some projects.

16.4.1 Definition
Value Engineering (VE) is the systematic application of recognized techniques, by multidisciplinary team(s). These techniques are to:

- Identify a product's function or service;
- Establish a function's monetary value or worth;
- Provide alternate ways, using creative techniques, to reliably accomplish necessary functions in the most effective and efficient manner.

Reducing the scope of a project, compromising the performance of an element, or simply substituting cheaper materials is not VE. VE is not just "good engineering." It simply answers the question, "What else will accomplish the purpose of the product, service, or process we are studying?" All costs are taken into account over the entire life of the project.

16.4.2 Authority for VE
Paragraph 4b of DOT Order 1395.1 Use of Value Engineering (VE) by the U.S. Department of Transportation dated April 13, 1987 provides: "All DOT grant awards for major transportation projects should strongly encourage the use of VE in the planning, design, and/or construction phases. This may include the use of VE incentive clauses in construction contracts."

16.4.3 Why VE is Necessary
The costs of highway needs far exceed the funds available for improvements. As the cost of highway construction increases, more emphasis is being placed on the maintenance and rehabilitation of existing facilities to maximize these available funds.

VE is a tool that can counteract these growing problems by providing (1) cost reduction, (2) product or process improvement, and (3) alternative means and materials for highway construction and maintenance.

16.4.4 VE Application (General)

VE may be applied at any point in highway development, operation, and maintenance. For maximum effectiveness, however, VE should be undertaken as early as possible (during the first 30 percent of the design process) when decisions on life-cycle costs are being made and valid project development recommendations can be implemented. When a complex, costly project is selected as a candidate for potential cost reductions, investigations should start as soon as a preliminary estimate is in hand.

VE should be employed when the ratio of potential savings to the cost of the VE study is significant. VE can also be used in evaluating standard details that are used repetitively on many projects. The cost of VE studies in preconstruction activities may be allocated to the preliminary engineering cost of the related project.

Local agencies are also encouraged to include a VE incentive clause in their construction specifications; such clauses encourage contractors to propose changes to the contract that fulfill a project's function requirements at lesser cost.

It is recommended that the local agency staff prepare a "VE Assessment Report" (Appendix 15.73) for all projects exceeding $2 million in total cost, or any other project determined by the staff to warrant a report. The report will address the project characteristics, cost per kilometer, potential savings of high cost items, and other considerations unique to the project. From this assessment, a recommendation will be developed as to whether a VE study is needed. If the local agency decides that a VE study should not be performed, the reasons should be documented.

When the local agency determines that a VE study should be performed, they should use the references listed in Section 15.47. The study results of the VE team should be included in the design report submitted to the LAG Certification Liaison along with the agency's recommended alternative.

When an alternative is acceptable to the local agency and MDT, the local agency submits a project prospectus to the LAG Certification Liaison. The project then proceeds as defined in this manual.

16.4.5 VE Coordinator

When the decision is made to proceed with a VE Team analysis, the Highways and Local Programs Operations Engineer will be the VE Coordinator.

The VE Coordinator will:

a. Inform the local agency in writing that a VE Study Team is being formed.
b. Reach agreement with the local agency on the time and place for the study. Select the VE Team Facilitator and the other members of the VE Team.
c. Request that the local agency provide the typical project related information, the name of the local agency's VE Team member, and the name of a local agency contact person (not the VE Team member) who will be responsible for providing facility and equipment related items required by the VE Team. The local agency team member should be an unbiased representative who would normally have no direct involvement in the project.

16.4.6 VE Study Team

The VE Study Team will be headed by a qualified facilitator not employed by the local agency. The duties and responsibilities of the facilitator will include, but are not limited to, the following:

a. Acts as chairperson at meetings of the VE Team.
b. Presents the findings and recommendations of the VE study to the local agency management and other interested agencies.
c. Provides the final VE Study Report to the local agency and the LAG Certification Liaison.

The VE Team will be comprised of five (5) members including the facilitator. One team member should have a background in bridge design or construction. If environmental factors are part of the study process, then the team should also include a member who has expertise on environmental issues. All VE Team charges will be billed to the local agency.

The VE Team will formally present their study results to local agency representatives, MDT Highways and Local Programs, and all other interested persons. Team findings and recommendations will then be documented in a formal report and sent to the local agency as soon as possible. Courtesy copies are sent to other appropriate agencies arid individuals.

The local agency will evaluate the VE Team recommendations. Should their preferred alternative differ from the prospectus or if no project prospectus has been approved, the local agency submits a new or revised prospectus for their preferred alternative to the LAG Certification Liaison. A summary of the VE study results should be included in this transmittal as reference material. The project then proceeds as defined in this manual.

16.4.7 Reference Materials

- *Value Engineering Guide for Cities and Counties*, Kernpter-Rossman International. *Operating Tip — Value Engineering,* NWT^2 Center, October 1985.
- *Value Engineering Contract Provisions on Federal Aid Highway Construction Projects,* Report No, 75-84-2 17, FHWA, December 1984.
- *Pavement and Shoulder Maintenance Performance Guide,* Report No. TS-84-208, FHWA, August 1984 (developed in conjunction with Arkansas, Colorado, Iowa, New Mexico, North Dakota, South Dakota, Utah, and Montana).
- *Value Engineering for Highways,* prepared for FHWA by Kempler-Rossman International, revised October 1983.
- *Value Engineering - Conference Summary Report,* Report No. TS-80-246, FHWA, August 7, 1980.
- *Value Engineering*: *A Systematic Approach,* Arthur E. Mudge. McGraw-Hill, New York, 1971.
- *Value Engineering in the Construction Industry,* Alphonse J. Dell'isola; Construction Publishing Co., Inc., New York, 1974.
- *Guidelines for Value Engineering (VE),* subcommittee on New Highway Materials, AASHTO-AGC-ARTBA Joint Cooperative Committee. Reprinted by USDOT/ FHWA, February 1983.
- *MDT Standard Specifications* (latest edition).
- *Montana Public Works Standard Specifications* (latest edition).

16.5 Additional Data Required for Special Projects

16.5.1 Traffic Signal Projects

The local agency must provide warrants for signalization in accordance with Part 4c of the *Manual of Uniform Traffic Control Devices* (MUTCD). Designs for signalization at intersections with state routes require review by MDT. A signal permit is required for all traffic signals on state routes. An early application to the MDT Regional Administrator is advisable.

16.5.2 Projects Involving State Routes

Designs for all projects involving state routes must be submitted to the LAG Certification Liaison for approval. All work at intersections with state routes requires submittal of an intersection plan to the LAG Certification Liaison for approval. Prints of existing intersection plans are available from MDT. Revisions should be shown on these prints.

16.6 Design Approval Notices

If hearings are held or if the opportunity for a hearing has been afforded, the local agency will publish a notice of design approval. The notice is published after the hearing has been held (or the opportunity offered) and after the design has been developed and approved. Its purpose is to inform interested parties of action taken in response to their comments or concerns.

The notice is published in the same manner as the hearing notice and should include the following:

a. A description of the location or design.
b. A map or sketch of the area involved.
c. A statement announcing that maps, sketches, and other supporting documentation are available to the public at a convenient location.

16.7 Appendices

16.7.1 Sample Request to Publish Notice of Design Approval

16.7.2 Sample FHWA Project Notice of Approval of Location and Design

16.7.3 Sample Format VE Assessment Report

16.7.4 Preliminary Field Review (PFR) Checklist

Appendix 16.7.1 Sample Request to Publish Notice of Design Approval

Ladies and Gentlemen:

Please publish one time only the attached Notice of Approval of Location and Design for the project referenced above.

It is further requested that you send to this office three (3) copies of an affidavit of publication, together with your billing in triplicate.

Please mail the affidavits and invoices to:

(Address of Approving Authority)

Very truly yours,

_____

Approving Authority

Attachment

Appendix 16.7.2 Sample FHWA Project Notice of Approval of Location and Design

The (Agency Name) does advise that the (Approving Authority on CA Agreement) has approved the following described Location and Design on _____
in_____Agency.

The project _____ (Termini)

The proposed project provides for

All maps and data concerning this project are available for public inspection at the office of the _____Agency Engineer, _____**,** Montana.

This notice is in conformance with Federal Aid Highway Act, 23 U.S.C. 101 et. seq., 128, 315, section 2(a), 2(b)(2), and 9(e)(1) of the Department of Transportation Act, 49 U.S.C. 1651(a) and (a)(2), 1657(e)(1); 49 CFR SS 1.4(c); and 23 CFR SS 1.32.

_____
Approving Authority

Appendix 16.7.3 Sample Format — VE Assessment Report

Agency:_____ Date:_____

Project:_____ Project #:_____

Project Limits:_____

Reviewing Team:_____

Project Characteristics

Length:_____Cost: $_____ Cost/Unit Length: $_____

Major structure (Y/N)_____ Includes items that have questionable complex or costly function (Y/N)_____

Extensive ROW (Y/N)_ _____

Complex project (Y/N)_____ Includes items difficult to construct (Y/N)_____

Includes items that appear too costly (Y/N) _____ Complicated or costly traffic control or detours (Y/N)_____

Includes critical or expensive materials (Y/N) _____

Horizontal Alignment: _____

Vertical Alignment: _____

Materials Source: _____

Design Concept: _____

Other Considerations: _____

Other Alternatives Considered: _____

Major High Cost Items and Potential Cost Savings Ideas	Cost	Potential Savings
1. _____	$_____	$_____
2. _____	$_____	$_____
3. _____	$_____	$_____

Conclusions and Recommendations: _____

Approving Authority Recommendations:

APPENDIX 16.7.4 Preliminary Field Review Checklist

Project No._____
Project Name_____
Date of Review_____
Proposed Ready Date_____

PROJECT LOCATION

County_____ Route Name_____

"AS-BUILT" PROJECTS		FROM		TO
Identification Number	Station	(Reference Point)	Station	(Reference Point)

Begin Station_____

End Station_____

Begin Reference Point_____

End Reference Point_____

Length: Urban_____, Rural_____, Total_____

Speed Zones_____

Last Major Work_____ Improved_____

ROADWAY FUNCTIONAL CLASSIFICATION

Type:_____

ACCIDENT DATA

Accident Rate_____ Avg. Accident Rate – Statewide:_____

Severity Rate_____ Avg. Accident Rate – Statewide:_____

Clusters_____

EXISTING GEOMETRIC DESIGN

Type of Surface_____

Existing Surface Width_____

_____

_____

Horizontal Curves that do not meet the criteria described in MDT's *Geometric Design Standards for Urban and Developed Areas*

P.I. Station (Reference Post) Radius Direction Superelevation

_____

_____

_____

Crest Curves that do not meet the criteria described in MDT's *Geometric Design Standards for Urban and Developed Areas*

_____

_____

_____

Sag Curves that do not meet MDT criteria

V.P.I. Station (Reference Post) Length G1 G2 Design Speed/SSD

_____

_____

_____

Grades that do not meet MDT criteria

Location Grade

_____

_____

Maximum Grade_____

Existing Fill Slopes (fill height, slope)

_____

Existing Cut Slopes (cut depth, slope)

_____

TRAFFIC DATA

Present AADT_____ DHV_____ Future AADT/year_____

Other_____

_____

_____

ROADSIDE HAZARDS (mailboxes, utilities, trees, rocks, signs, culvert ends, etc.)

_____

_____

_____

_____

PROPOSED WORK (type of project)_____

_____

FIELD REVIEW RECOMMENDATION

Design Speed_____ Terrain_____

Finished Surface Width_____Standard Width_____

Overlay Thickness_____

Pedestrian Features (sidewalk, ADA criteria)_____

_____

_____

Curb & Gutter_____

Cold Milling (depth, width, use of millings)_____

_____

Guardrail (new, upgrade, structure, etc.)_____

_____

Special Considerations_____

_____

_____

_____

SURVEY

Aerial Mapping_____ Full Survey_____ Partial Survey_____

Cross Sections_____

Pipes: Condition_____ Soil Tests_____

R-Value_____ Corings_____

Digouts_____

Hydraulic Survey_____

Target Date of Survey Completion_____

Other Items_____

_____

RIGHT-OF-WAY

Existing R/W Width_____

New R/W (incl. possible permits)_____

Limited Access_____

Railroad Requirements

UTILITIES

Telephone

Power Poles

Railroad Conflicts

Sewer & Water Conflicts

Adjustments (drains, valves, etc.)

Other

ENVIRONMENTAL ISSUES

Environmental Document Type

4(f) Lands

6(f) Lands

Wetlands_____

_____

Possible Hazardous Waste Sites_____

_____

Cultural Survey Required_____

_____

Historic Bridges_____

Other (threatened and/or endangered species, protected streams, fisheries, landmarks, etc.)

_____

_____

_____

PUBLIC HEARINGS

Formal_____ Informational_____ News Release_____

TRAFFIC ITEMS

Signing (upgraded to MUTCD criteria)_____

_____

Lighting, Noise, etc._____

_____

_____

Intersections (signalization, auxiliary lanes)

_____

_____

_____

GEOMETRIC DESIGN EXCEPTION

Grade_____ Fill/Cut Slopes_____

Width_____ Design Speed_____

Vertical Curves_____ Clear Zones_____

Horizontal Alignment_____

Other_____

_____

_____

HYDRAULIC INFORMATION

Structures ("as-built", station, reference point, type, replace, name of drainage, detour)

_____

_____

_____

Storm Drain Systems (upgrades, new inlets, trunk lines etc.)

_____

_____

_____

_____

Irrigation Facilities (location, size, type, replace (y/n), detour)

_____

_____

Pipes Over 84" _____

_____

_____

Other (backwater, debris, overtopping, etc.)_____

_____

_____

_____

Administer of the Floodplain (county and/or incorporated community)_____

_____

Materials and Geotechnical Considerations_____

_____

_____

_____