North Carolina Department of Transportation

Value Management Office

NCDOT

Value Management Office External Guidelines

Version 8.0

October 2017

I. Forward

I have worked in Value Management since December 2010 and accepted the position of State Value Management Engineer in October 2013. As the State Value Management Engineer, it has been my personal goal to ensure that the administration of NCDOT's valuable programs is performed in such a manner as to fully utilize the knowledge and abilities of the talented pool of planners, designers, engineers, and construction personnel throughout the Department. I am grateful for the opportunity to work as a public servant and strive to make the Value Management Office an effective tool for the Department in doing its part for the great state of North Carolina.

As the population of North Carolina continues to grow, so do the demands of the State Department of Transportation. It is imperative, especially in this current fiscal environment, that the Department embrace the importance of value management principles. The ability to maximize the effectiveness of tax payer dollars is paramount to the Department's success in providing efficient, safe, and reliable transportation to the citizens of North Carolina. If there are any questions or comments regarding any facet of the NCDOT Value Management Office, please don't hesitate to contact me.

Thanks for all you do for the citizens of North Carolina.

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NCDOT State Value Management Engineer

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Contents

I. Forward 2

II. External Guidelines 5

A. About 5

B. Services Provided 5

1. The Value Engineering Program (VEP) 6

2. The Value Engineering Proposal Program (VEPP) 12

3. The Risk Assessment Program (RAP) 14

4. The Product Evaluation Program (PEP) 16

5. The Resource Conservation Program (RCP) 21

6. The Constructability Review Program (CRP) 23

7. The Post Construction Assessment Program (PCAP) 25

C. Contact Personnel 27

1. State Value Management Engineer 27

2. Value Management (VMO) Engineer 27

3. Liaison 27

4. Contact 27

D. Acronyms 28

III. APPENDICES 30

Appendix A-1. 23 CFR Part 627 31

Appendix A-2. Concurrence Points 32

Appendix A-3. VE Recommendation Form SOP 33

Appendix A-4. Part 627 – Value Engineering 37

Appendix C-1. Activity List for Risk Identification 42

Appendix C-2. Risk Assessment Overview 43

Appendix C-3. Risk Screening Worksheet 46

Appendix D-1. GS136-18.04 Product Evaluation Program 47

Appendix D-2. Product Feedback Form v0.2 Reader 48

Appendix D-3. Proprietary Approval Form Reader 49

Appendix E-1. GS 136-28.8 Rewrite 51

Appendix G-1. PCAP Framework 53

Appendix H-1. Division Liaison List 62

II. External Guidelines

A. About

The purpose of the North Carolina Department of Transportation (NCDOT) Value Management Office (VMO) is to ensure the prudent statewide use of resources and revenues. The VMO is made up of seven (7) statewide programs that contribute to the Department's overall management objectives of lean operations by improving quality and outcomes, reducing costs without compromising function, and increasing the use of environmentally sound and energy efficient practices and materials.

B. Services Provided

These internal guidelines will detail the functions and processes of the seven (7) principal Value Management Programs:

1. The Value Engineering Program (VEP)
2. The Value Engineering Proposal Program (VEPP)
3. The Risk Assessment Program (RAP)
4. The Product Evaluation Program (PEP)
5. The Resource Conservation Program (RCP)
6. The Constructability Review Program (CRP)
7. The Post Construction Assessment Program (PCAP)

1.The Value Engineering Program (VEP)

The purpose of the VEP is to meet the expectations set forth by the Code of Federal Regulations (CFR) Title 23, Chapter 1, Part 627 (Code). See Appendix A-1 for the full code. This Code requires States to utilize a "systematic application of recognized techniques by a multi-disciplined team to identify the function of a product or service, establish a worth for that function, generate alternatives through the use of creative thinking, and provide the needed functions to accomplish the original purpose of the project, reliably, and at the lowest life-cycle cost without sacrificing safety, necessary quality, and environmental attributes of the project." The Value Engineering (VE) study is completed during the planning or design phase with experts looking specifically at ways to improve the design. In addition, the VEP is dedicated to upholding the NCDOT policy to design, construct and maintain the State Highway System in the most cost-effective and efficient manner possible.

To initiate these discussions for the upcoming Federal Fiscal Year (FFY), the VEP develops an annual VE Study List each year. The Value Engineering (VE) Study List is compiled based on the requirements outlined in the CFR. The process to develop this list is in Section (e) of this chapter.

Other projects may be added to the initial list if the project has been recommended by the Department. It is a goal of the VEP to conduct VE Studies prior to the Right-of-Way (ROW) Date when at all possible. Design-Build projects are eligible for VE studies but are not required regardless of dollar amount.

Once the State Value Management Engineer and the Value Management Office (VMO) Engineer finalize the list of projects, tentative dates for the VE Studies are selected. The date selected is based on the Let Date ensuring the projects with the earliest Let Dates are scheduled first.

The Value Management Office has the following annual goals:

Federal Fiscal Year Criteria	Goal
# VE Studies Performed	3
# Recommendations submitted	30
# Recommendations approved	15
Estimated Cost Savings	$3 Mil

a) Personnel

The following VMO Engineers are principle on this program.

Lead	Alyson Tamer, PE, CPM	awtamer@ncdot.gov	919-707-4806
Support	Clare Griffith, PE	cfgriffith@ncdot.gov	919-707-4812
Division Liaisons	See Appendix H-1		

b) Process

(1) LIST DEVELOPMENT

The annual VE Study List (List) is developed each year based on Code requirements using the 5 Year Work Program Let List.

The 36 month Let List – found at https://connect.ncdot.gov/letting/Pages/12month.aspx – is used to do periodic checks and stay up to date with the List. The list includes projects for Value Engineering Studies and is more extensive than the federal requirements. The federal requirements require a VE study conducted on any project costing $50 million or $40 million if a bridge project and is only for projects located on the National Highway System (NHS). While all projects meeting the federal regulations regarding VE studies will be studied, the Department recognizes the potential benefit from conducting VE studies on projects that do not meet these regulations. Therefore, a list of all projects (both federally-assisted and state-funded) with estimated project costs of $10 million or more is developed in order for these projects to be considered and potentially added to the list of VE Study candidates.

The State VM Engineer and the VMO Engineer contact the designated Design and planning staff to review the potential study list to gain feedback and interest. Additional input can also be requested during a meeting with the upper management.

Projects with issues that add complexity to the project design can be added to the list of potential VE Studies even if not federally required. These complexities may include, but are not limited to: critical constraints, complex technical issues, expensive solutions, challenging or unusual circumstances, complicated functional requirements or projects experiencing scope creep.

The types of projects that usually provide the highest potential for value improvement are:

- Projects with alternate solutions that vary the scope and cost
- New alignment or by-pass sections
- Widening of existing highways for capacity improvements
- Major or unique structures
- Interchanges on multi-lane facilities
- Projects with extensive environmental or geotechnical requirements
- Difficult materials requirements or inferior material sources
- Major reconstruction of existing highways
- Projects with significant traffic disruption or requiring major traffic control
- Projects with multiple stages
- “Shelf Projects” that have been reprogrammed

A project that is below the $10 million threshold but would benefit from a VE Study may be submitted by the various NCDOT Business Units as a candidate project for a VE Study. Projects can be recommended that are potentially needing a VE Study by anyone in the Department.

Information which can be included on the initial list includes:

- State Transportation Improvement Program (STIP) Number
- Let Date
- Division
- Project Engineer
- Cost estimate
- Project description

(2) NOTIFICATION

Once the project is selected based on the parameters, the VMO Engineer and Project lead will determine the best time for a study.

(3) STUDY TIMING

As part of the ongoing coordination with Department Management, the VMO Engineer verifies that the selected project to be evaluated during a scheduled VE Study is at a point in the project development process that an evaluation would be beneficial. This is most critical with the projects being reviewed during the planning stages. It allows for the recommendations to be incorporated into the early stages of design. This would typically occur after Concurrence Point 4A (CP-4A), which deals with avoidance and minimization efforts and before Concurrence Point 4B (CP-4B), which is a review of 30% complete hydraulic design plans. However, other windows for a study are available and each project will be evaluated to determine the best time to conduct the study for that project.

To learn more about concurrence points, see Appendix A-2 Concurrence Points.

Concurrence Point	**Scope**	**1**	**2**	**2A**	**3**	**4A**	**4B**	**4C**	**Permit**
Optimal Window						**Study**			

(4) STUDY DURATION

The duration of the VE Study is based on the complexity of the individual project but will typically take one to two calendar days.

(5) STUDY STEPS

Prior to the Study the VMO Engineer requests information from the Project Manager related to the project. This information includes basic project background, preliminary cost estimate, updated project location information.

At the Study all participants will be provided with project details and the VE Study process shall be conducted in accordance with the following seven phases of the nationally recognized VE Job Plan:

(1) Information Phase: This phase is all about gathering the information about the project including scope, cost, and constraints.

(2) Function Analysis Phase: During this phase the goals or functions of each component of the project are defined.*

(3) Creative Phase: This stage is a brainstorming phase to generate alternative solutions to enhance the project. It can also be solutions to what was determined in Phase 1 against the goals in Phase 2. These proposed solutions are ideas without evaluation.

(4) Evaluation Phase: The Team refines and combines ideas, develops functional alternatives, and completes comparison from the solutions determined in Phase 3. Appropriate tools of comparison include advantage and disadvantage comparison and a rating of a 1, 0 or -1. These designations are used after a discussion of each idea. A rating of 1 is the decision by the team to carry the opportunity forward to development. If more discussion on the idea is needed, a 0 rating is given. An idea which will not be carried forward for development will receive a -1 rating. By the end of the evaluation phase

in the VE process, all ideas will have a 1 or -1 rating. The opportunities given a 1 rating are now identified as Recommendations. Design suggestions can also be listed here. These are ideas a team has but the plan may not be developed enough for the idea to be a recommendation.

(5) Development Phase: Based on the Evaluation Phase, the Team begins to develop in detail the Recommendations carried forward. During this phase it is essential to establish costs and backup documentation needed to individually convey the alternative solutions.

(6) Presentation Phase: The Findings of the Study are presented to management in the form of a written report. Each Recommendation is documented on individual Recommendation Forms included in the Report along with information documenting the rest of the VE Study. Additionally, a written justification, based on sound engineering principles, can be supplied with all Recommendations. The Report is then sent to the appropriate Business Units to coordinate the final determination. This phase may also include a verbal presentation.

(7) Resolution Phase: As part of the final phase of the VE process, each Recommendation is evaluated by management and assigned Accepted, Accepted with Modifications, or Rejected. All Recommendations with an Accepted or Accepted with Modifications status are incorporated into the project. The VE Recommendation Form SOP (Appendix A-3) outline how a recommendation is reviewed from conceptual approval through final approval and implementation.

Note: * A study can sometimes include a Risk Assessment. See section B.3 The Risk Assessment Program for details on Risk Assessments.

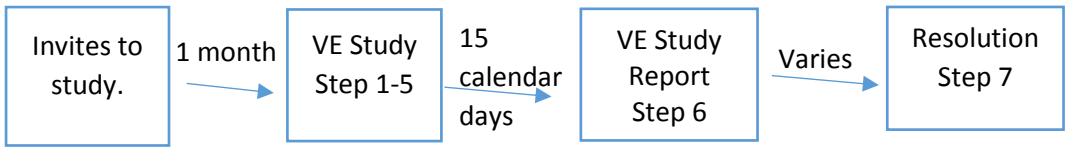
(6) VE RECOMMENDATION INCORPORATION

Following the Resolution Phase (as described in step 7 above), if the VE Recommendation is to be "Accepted" or "Accepted as Modified", the VE Recommendation Form will denote if the Recommendation has been implemented into the design by the time the final disposition was returned to the Value Management Office. If marked yes, then a summary describing the steps taken to implement the Recommendation will be included on the VE Recommendation Form. If marked no, then an anticipated date of implementation will be provided.

Once received by VMO, the Recommendation decisions will be recorded in the VE Study Recommendation tracking spreadsheet. This spreadsheet will track the decision of each Recommendation as well as the date (or anticipated date) of implementation into the project design, if applicable. The Value Management Office will use this spreadsheet to follow up with design engineers regarding Recommendations which have not had a decision or are past the anticipated implementation date. VMO does a final check on accepted recommendation to ensure how it was incorporated.

c) Timeline

The following timeline is associated with the steps in 1.e.5 above.



d) Outputs

(1) VE STUDY REPORTS

All VE Studies will be conducted according to American Association of State Highway and Transportation Officials (AASHTO) and Federal Highway Administration (FHWA) guidelines. A memorandum with the subject "Part 627 – Value Engineering" (found in Appendix A-4) notes that the production of a formal written VE study report will include at a minimum the following:

- Project information
- Identification of the VE analysis team
- Background and supporting documentation, such as information obtained from other analyses conducted on the project (e.g., environmental, safety, traffic operations, constructability)
- Documentation of the stages of the VE Job Plan which would include documentation of the life-cycle costs that were analyzed
- Summarization of the analysis conducted
- Documentation of the proposed recommendations and approvals received at the time the report is finalized (this shall also include related information to support the State DOT's and FHWA's VE program monitoring and reporting)
- 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)

For bridge projects, the VE Analyses must also:

- Include bridge substructure and superstructure requirements based on construction material
- Be evaluated based on:
    - an engineering and economic basis, taking into consideration acceptable designs for bridges
    - analysis of life-cycle costs and duration of project construction

This Report is sent to NCDOT management for consideration. After reviewing the recommendations, the Value Management Office is given the final disposition for each of the recommendations. The VMO team has a goal of submitting the VE Study Report to management within 15 calendar days from the end of the VE Study.

The participating VE Study Team also receives a copy of the Report as well as a copy of the management response.

(2) VE ANNUAL REPORT

The State VM Engineer and the VMO Engineer will be responsible for preparing the annual VE Report and providing it to FHWA upon request at the end of each FFY. This report provides an overview and summary of the VEP during the previous FFY. Information regarding NC VMO Policy, coordination, guidelines, training, goals and measures, evaluations, reporting, and cost savings are some of the required elements of the report. VEP sets annual goals to exceed the expectations of FHWA.

e) VE Training

The Value Management Office conducts at least one training per year. Participants will be selected in coordination with the various Business Units to ensure the training includes a diverse group of

disciplines and experience levels. The training will include, at a minimum, how to conduct a VE study and can be conducted in person or via virtual platform.

2.The Value Engineering Proposal Program (VEPP)

According to American Association of State Highway and Transportation Officials (AASHTO), Value Engineering (VE) principles can be applied during the construction of the project through Value Engineering Proposals (Proposals).This differs from the VE study in that the project is in construction and it is initiated by the contractor. The purpose of the Value Engineering Proposal Program (VEPP) is to encourage contractors to develop Value Engineering ideas by utilizing their design and construction ingenuity, experience, and background. These ideas allow the Department to continue the Value Engineering process through the construction phase of the project. Typically, these ideas will result in a cost savings for the Department and the contractor.

a) Personnel

The following Value Management Office (VMO) Engineers are principles on this program.

Lead	Doug Cantrell, PE, PMP	dcantrell@ncdot.gov	919-707-4814
Support	Ben Johnson, PE	bljohnson2@ncdot.gov	919-707-4801

b) Process

The VEP evaluation process as outlined in Section 104-12 in the NCDOT 2018 *Standard Specifications for Roads and Structures* is summarized below:

1. An optional preliminary Value Engineering Proposal shall be submitted by the Contractor to both the Resident Engineer and the State Value Management Engineer. This step includes several rounds of clarification and back and forth.

2. A copy of the Final Value Engineering Proposal shall be submitted by the Contractor to both the Resident Engineer and the State Value Management Engineer.

3. The Value Management Office will facilitate the evaluation of the Proposal by coordinating with the respective Division, the Construction Unit, and the appropriate NCDOT Business Units (Roadway Design, Structures Management, Geotechnical Engineering, Hydraulics, Traffic Management, etc.) to determine if the Proposal is recommended for approval.

4. Based on the results of this evaluation, a memorandum from the State Value Management Engineer will be sent to the State Construction Engineer with a recommendation to either approve or reject the Proposal. This will be provided within twenty (20) calendar days of receipt of the final Proposal.

5. The Construction Unit (CU) will review the memorandum and make the final recommendation to approve or reject the Proposal. The Resident Engineer and the State VM Engineer will be notified of the decision when the letter is sent to them.

6. The Resident Engineer will notify the contractor of the decision.

Link to the full specifications can be found here - https://connect.ncdot.gov/resources/Specifications/StandSpecLibrary/2018%20Standard%20Specifications%20for%20Roads%20and%20Structures.pdf .

c) Timeline

If the Proposal is accepted, the necessary changes will be documented by Supplemental Agreement (SA). Included as a part of the SA will be requirements for price adjustments giving the Contractor 50% of the net savings to the project resulting from the Proposal. The VMO should request a copy of the SA executed for these changes. This SA will be used to track the implementation of Proposals and the final cost savings.

Additionally, the Contractor will be required to submit final plans incorporating the approved Proposal to the VMO Engineer. Accepted plan changes resulting from Final Proposals may be distributed by the Value Management Office to the various Business Units for their records. Design-Build Proposals will have changes reflected in the Request for Change (RFC) plans. The VMO Engineer may ensure that the pertinent information from the Proposal is documented and, in coordination with the Construction Unit, will pursue incorporating engineering practices from accepted Proposals into the appropriate NCDOT policies and standards.

d) Training

Training on how to complete a Value Engineering Proposal can be conducted by the Value Management Office Engineer on request by Divisions. These trainings can be done in person or on a virtual platform.

3.The Risk Assessment Program (RAP)

Risk Assessments (RAs) have been performed as part of NCDOT day-to-day business for years; however, the NCDOT Value Management Office is striving to formalize internal procedures to incorporate the RA process, when applicable, into the existing VE Program or to conduct an RA as a stand-alone process. RAs can be done on project, programs, new legislature requirements, etc.

Risk management provides an opportunity to identify and develop management strategies to minimize the risk and optimize the desirable performance.

a) Personnel

The following Value Management Office (VMO) Engineers are principles on this program.

Lead	Alyson Tamer, PE, CPM	awtamer@ncdot.gov	919-707-4806
Support	Clare Griffith, PE	cfgriffith@ncdot.gov	919-707-4812

b) Process

Planning: Unit Heads and Residential Engineers can submit for a RA to the Value Management Office Engineer. Request should include a link to the project files in addition to the request complete date. Additionally, the VMO Engineer will also find opportunities for RA studies and approach NCDOT personnel about the opportunity.

Workshop: Typically a half day or full day work-shop will be scheduled. The attendees can be involved in the project or program or can be independent. The session is largely a brainstorming session where all possibilities are brought to the table and broken down. During this workshop the following will be completed, sample documents are in Appendices C-1, C-2, and C-3:

i. Establish an overarching goal;
ii. Establish all the functions that are a part of achieving the goal;
iii. List challenges associated with each function;
iv. Rank challenges based on risk level with probability and consequence;
v. Brainstorm solutions for high risk challenges.

c) Timeline

The following timeline is based on the process described above.

d) Outputs

The challenges and proposed solutions will be documented in a risk table and a summary report of the steps forward will be sent to pertinent parties. Sample of the table is included in Appendix C-3.

e) Training

Training on how to complete a RA can be conducted by the Value Management Office Engineer on request. These trainings can be done in person or a virtual platform.

4.The Product Evaluation Program (PEP)

The purpose of the Product Evaluation Program (PEP) is to provide a comprehensive evaluation of products to be used in all NCDOT operations. This mandated program requires that reviews are completed in one year; a copy of this product evaluation law is in Appendix D-1. Additionally, the program evaluates if products are viable for use in North Carolina's infrastructure by performing a detailed review of product specifications, technical data, and test results and, in certain instances, monitor installations and provide documentation on the product's durability and performance.

Products evaluated are typically those that have not been previously evaluated by NCDOT and where a NCDOT Standard Specification does not exist, or products that have a NCDOT Standard Specification will call for a product to be selected from the Approved Products List (APL).

Products submitted to NCDOT for evaluation must meet the following criteria:

- The vendor must use the most recent PEP Application and submit electronically;
- The vendor must identify the proposed use of the product or technology;
- The product or technology must be directly related to the transportation system; and,
- The product or technology must be fully developed, marketable, and commercially available.

a) Personnel

The following Value Management Office (VMO) Engineers are principles on this program.

Customer Service Line		**productevaluation@ncdot.gov**	919-707-4808
Lead	Natalie Roskam, PE, CPM, PMP	nroskam@ncdot.gov	919-707-4807
Lead	Ben Johnson, PE	bljohnson2@ncdot.gov	919-707-4801
Support	Clare Griffith, PE	cfgriffith@ncdot.gov	919-707-4812
Support	Doug Cantrell, PE, PMP	dcantrell@ncdot.gov	919-707-4814
	Division Liaisons	Appendix H-1	

b) Process

(1) RECEIPT AND DISTRIBUTION OF PEP APPLICATION

Prior to submitting their application, the customer needs an NCID. The steps to obtain an NCID can be found here –

For US Company:
https://connect.ncdot.gov/resources/Products/Documents/Steps%20for%20Setting%20up%20NCID-US.pdf

Non-US Company:
https://connect.ncdot.gov/resources/Products/Documents/20170824%20Steps%20for%20Setting%20up%20NCID-%20nonUS.pdf

The PEP Application is submitted via the website link provided here:
https://connect.ncdot.gov/resources/Products/Pages/default.aspx

Information on how to submit a product can be found here:
https://connect.ncdot.gov/resources/Products/Documents/NCDOT%20PEP%20Submission%20Process.pdf

Should the customer lose their password or username, instruction on how to reset them can be found here:
https://connect.ncdot.gov/resources/Products/Documents/20170824%20Forgot%20NCID%20Username%20or%20Password.pdf

Once the application is submitted a notification that the application has been submitted will be sent to the Service Account (productevaluation@ncdot.gov). Upon receipt of a PEP Application, the VMO Engineer determines if the product should be evaluated for possible inclusion on the APL.

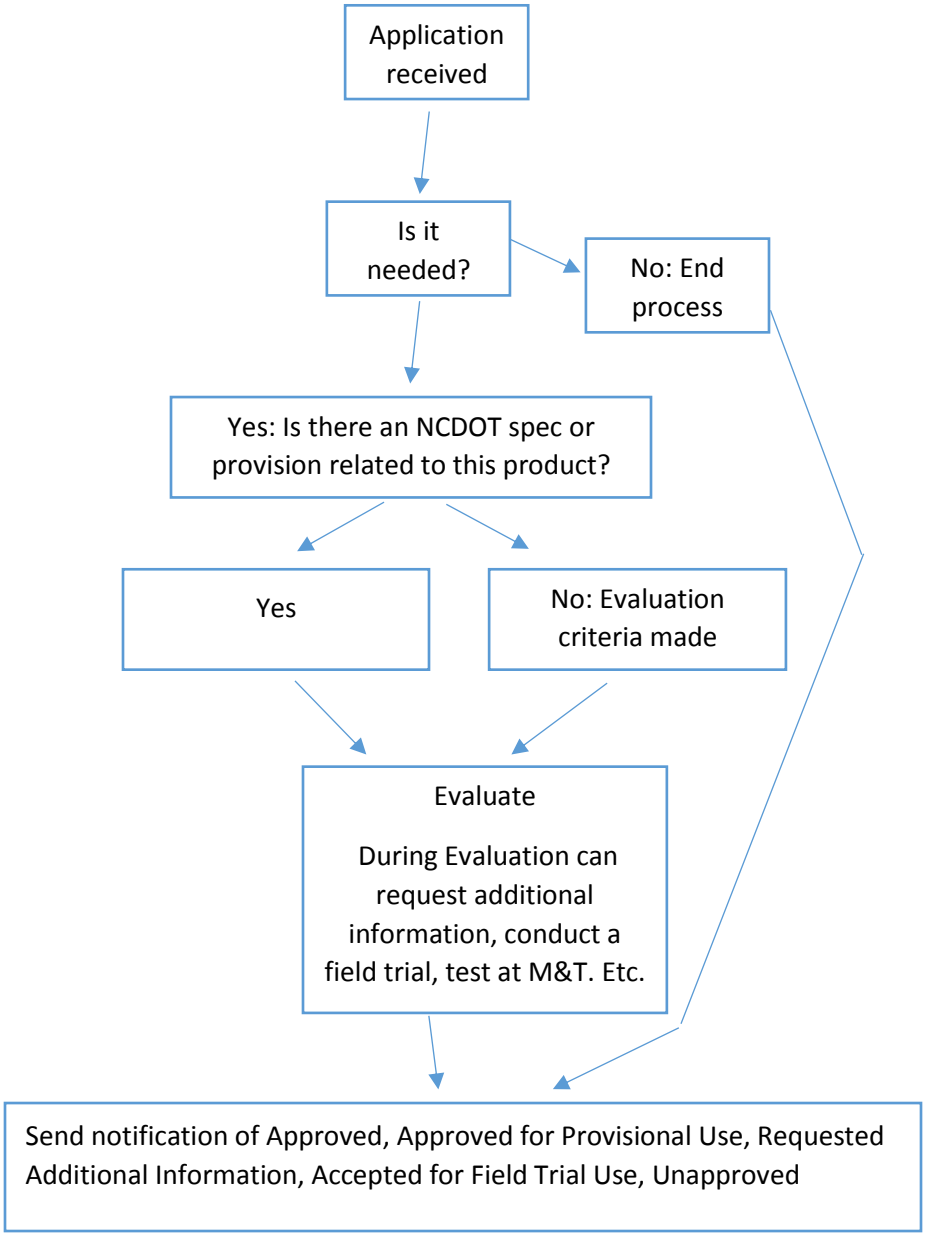
If the product will be evaluated for possible inclusion on the APL, the VMO Engineer will acknowledge receipt of the Application to the applicant via email and assign an identification number.

The VMO Engineer will process the Application and forward to the appropriate Technical Work Group (TWG) for evaluation.

Once a product is in the field, the VMO Engineer collects information on products in use through the Product Feedback Form v0.2 Reader, Appendix D-2. It can also be found online:
https://connect.ncdot.gov/resources/Products/Documents/Product%20Feedback%20Form%20v0.2%20Reader.pdf .

(2) TECHNICAL WORK GROUP EVALUATION PROCESS

The following flow chart explains the evaluation process for the Technical Work Group (TWG).



(3) FIELD TRIAL PROCESS

When a product is given the status of Accepted for Field Trial Use the manufacturer will be informed as described in the previous section. This status requires that the product be placed on a project and be monitored for approximately one year. It is the manufacturer's responsibility to find the project site and inform PEP of the project. The product has to be installed within two (2) years of being given the Field

Trial status, with a final report received three (3) years after status provided. See "Accepted For Field Trial" Status Guide - https://connect.ncdot.gov/resources/Products/Documents/20170706%20Accepted%20for%20Field%20Trial%20Status%20Guide.pdf

(4) APPEALS PROCESS

If a vendor does not agree with the determined product status, the vendor may elect to appeal the product status. The vendor must appeal in writing via email to the PEP Engineer within 30 calendar days of product status notification and the appeal must include new or additional product information. The PEP Engineer determines if the appeal documentation is complete.

If the appeal documentation is complete and contains pertinent additional information, the PEP Engineer will forward the appeal package to TWG for re-evaluation. If the appeal documentation is not complete or does not contain pertinent additional information, the PEP Engineer will notifies the vendor that the original product status stands.

During the evaluation process, the TWG may request a meeting with the vendor to further discuss the product. Should the vendor fail to respond to this meeting request within 30 calendar days, the product will not be considered for further review. The vendor must submit a new PEP Application to be considered for future evaluation. The vendor is able to appeal the decision twice.

(5) RECERTIFICATION

The PEP has a Recertification process to ensure the APL is an up to date with available products for use by NCDOT. The goal of Recertification is to ensure that all listed products are commercially available and meet current standards. Recertification requests are typically sent on an annual basis. Vendors are required to follow the instructions in the recertification requests which typically require submitting a signed statement showing their products meet the current NCDOT standards. Failure to complete recertification will result in the products being removed from the APL in order to maintain their existing status on the APL.

(6) CHECKLISTS

Some of the submitted products require information for a complete review by the TWG or VMO Engineer. This information can be found via checklist on the PEP website: https://connect.ncdot.gov/resources/Products/Pages/default.aspx

(7) PROPRIETARY

The procedure for using a propriety item on North Carolina DOT Projects is governed by CFR Title 23 Highways and can be found here: https://connect.ncdot.gov/resources/Specifications/Specification%20Resources/Proprietary%20Product%20Guidelines.pdf

The Proprietary Approval Form can be found in Appendix D-3.

(8) PRODUCT STATUS DEFINITIONS

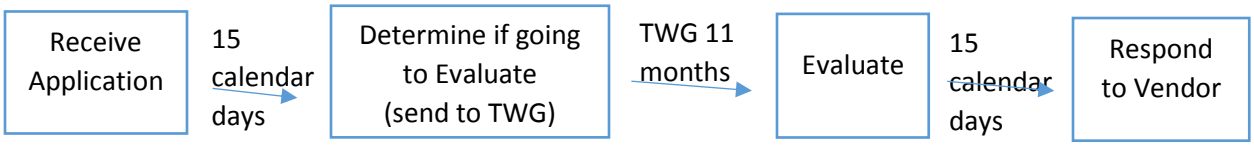
The following are the potential product status and associated definitions:

- Approved: The product is approved for use with no restriction and may be used at the engineer's discretion.

- Approved for Provisional Use (APU): The product is approved for use with certain limitations. The limitation will be listed on the Approved Products List or you may contact the VMO Engineers for further description.
- Accepted for Field Trial Use: The product has been evaluated and will need to be observed in the field before a final status will be given.
- Under Evaluation: The product is currently being reviewed and has not been approved for use. If you have interest in using a product that is under evaluation, contact the VMO Engineers to discuss the possibility of a field trial.
- Requested Additional Information: The product is currently being reviewed and additional information has been requested from the vendor, which is needed to complete the evaluation.
- Appeal: Applicant appealed original NCDOT decision. The appeal is under review pending new information submitted.

c) Timeline

The following timeline is related to Section 5 above.



d) Outputs

The Approved Products List (APL) is the master list that contains details of all the approved products to be used in NCDOT operations.

In addition, the VMO Engineer researches innovated technologies to implement in NCDOT operations and to present to the Board of Transportation at their monthly meeting. All reports can be found on the PEP website, https://connect.ncdot.gov/resources/Products/Pages/default.aspx.

e) Training

Vendors may offer training to NCDOT staff through the VMO. Prior to the training, an agenda and suggested times must be submitted and approved by the VMO Engineer. Divisions and Technical Work Groups can request training on the PEP Program to be conducted by the VMO. These training can be done in person or via a virtual platform.

5.The Resource Conservation Program (RCP)

The purpose of the Resource Conservation Program (RCP) is to promote the use of recycled and solid waste by-products and the reuse of materials in the construction and maintenance. This is in accordance with the NC General Statute (G.S.) 136-28.8 and is included in NCDOT Specification 104 Scope of Work, Article 104-13. A copy of this can be found in Appendix E-1.

a) Personnel

The following Value Management Office (VMO) Engineers are principles on this program.

Lead	Alyson Tamer, PE, CPM	awtamer@ncdot.gov	919-707-4806
Support	Clare Griffith, PE	cfgriffith@ncdot.gov	919-707-4812
Division Liaisons	Appendix H-1		

b) Process

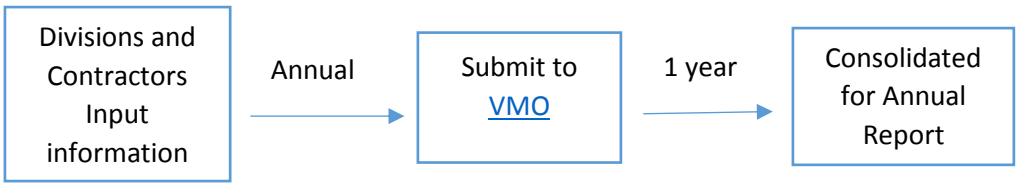
The process for reporting and collecting the recycled material data is now online. The contractors and division personnel will use the following link:

https://connect.ncdot.gov/resources/Products/Pages/Recycle.aspx

The contractors and divisions report annually.

c) Timeline

The following timeline is related to the above process.



d) Output

On or before October 1 of each year, the Department shall report to the Division of Environmental Assistance and Outreach of the NC Department of Environmental Quality, NCDEQ (formerly the NC Department of Environment and Natural Resources, NCDENR) as to the amounts and types of recycled materials that were specified or used in contracts that were entered into during the previous fiscal year. On or before December 1 of each year, the Division of Environmental Assistance and Outreach shall prepare a summary of this report and submit the summary to the Joint Legislative Commission on Governmental Operations and the Joint Legislative Transportation Oversight Committee. The summary of this report shall also be included in the report required by G.S. 136-28.8. Located in Appendix E-1.

(1) CONTRACTORS (POST-LET)

Contractors are to report the quantities of reused or recycled materials either incorporated in the project or diverted from landfills and any practice that minimizes the environmental impact on the project annually on the Project Construction Reuse and Recycling Reporting Form. The Project

Construction Reuse and Recycling Reporting Form and a location tool for local recycling facilities are available at:

https://connect.ncdot.gov/resources/Products/Pages/Recycle.aspx

e) Training

Training on how to complete the processes in the RCP can be conducted by the Value Management Office Engineer on request. These trainings can be done in person or via virtual platform.

6.The Constructability Review Program (CRP)

The primary purpose of the Constructability Review Program (CRP) is to gather an experienced team of engineers and construction contractors to identify, examine, and resolve constructability challenges before a project is let for construction. The discussion and recommendations developed during Constructability Reviews (CR) are primarily focused on ensuring that the project's design is constructible.

a) Personnel

The following VMO Engineers are principles on this program.

Lead	Doug Cantrell, PE, PMP	dcantrell@ncdot.gov	919-707-4814
Support	Ben Johnson, PE	bljohnson2@ncdot.gov	919-707-4801

b) Process

(1) PROJECT SELECTION

Projects just before the 65% design plan milestone are reviewed and typically discussed with Roadway Design, Traffic Management, and/or the Division Construction Engineer, although any unit can request a Constructability Review at any time throughout the design phase. The VMO Engineer looks at the Let List to know what projects are coming up. Projects from this list that have potential constructability issues are chosen and scheduled for CRs. Projects may also be recommended for Constructability Reviews if one would be beneficial.

(2) CR TEAM SELECTION

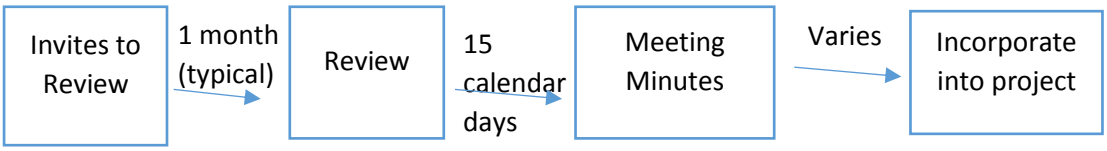
CRs utilize a multi-disciplined team of Department Engineers and Private Construction Contractors to provide input on the constructability challenges associated with each project. Team participants are generally selected based on their individual experience and their level of familiarity with the project, with those being most familiar with the project being included in the CR Team.

(3) REVIEW

The focus of each CR will vary greatly depending on the unique challenges associated with each project. The CR Agenda will include all challenges identified prior to the meeting, as well as time for the construction contractors to share any ideas or concerns they have with the current design.

c) Timeline

The following timeline is related to the process above.



d) Output

After the completion of a CR, a summary of the meeting discussions and action items are compiled into Constructability Review meeting minutes. These minutes will be completed and distributed to the

meeting attendees no later than fifteen (15) calendar days after the conclusion of the CR. A sample of the meeting minutes review is provided in Appendix F-1.

e) Training

Training on how to complete the processes in the CRP can be conducted by the Value Management Office Engineer on request. These trainings can be done in person or via a virtual platform.

7.The Post Construction Assessment Program (PCAP)

The purpose of the Post Construction Assessment Program (PCAP) is to collect data on lessons learned during the life cycle of a project and share those lessons in a meaningful way to be incorporated into future projects. These lessons learned allow for NCDOT to adjust future cost estimates, update standards, and change policies to continuously strive to be an effective and efficient organization that works well.

a) Personnel

The following VMO Engineers are principles on this program.

Lead	Clare Griffith, PE	cfgriffith@ncdot.gov	919-707-4812
Support	Doug Cantrell, PE, PMP	dcantrell@ncdot.gov	919-707-4814

b) Process

The process is under review as this program is still being developed. The draft framework can be found in Appendix G-1, a summary is as follows:

(1) TRENDS

Design, Construction, Maintenance, and Operations determine which trends they want feedback on.

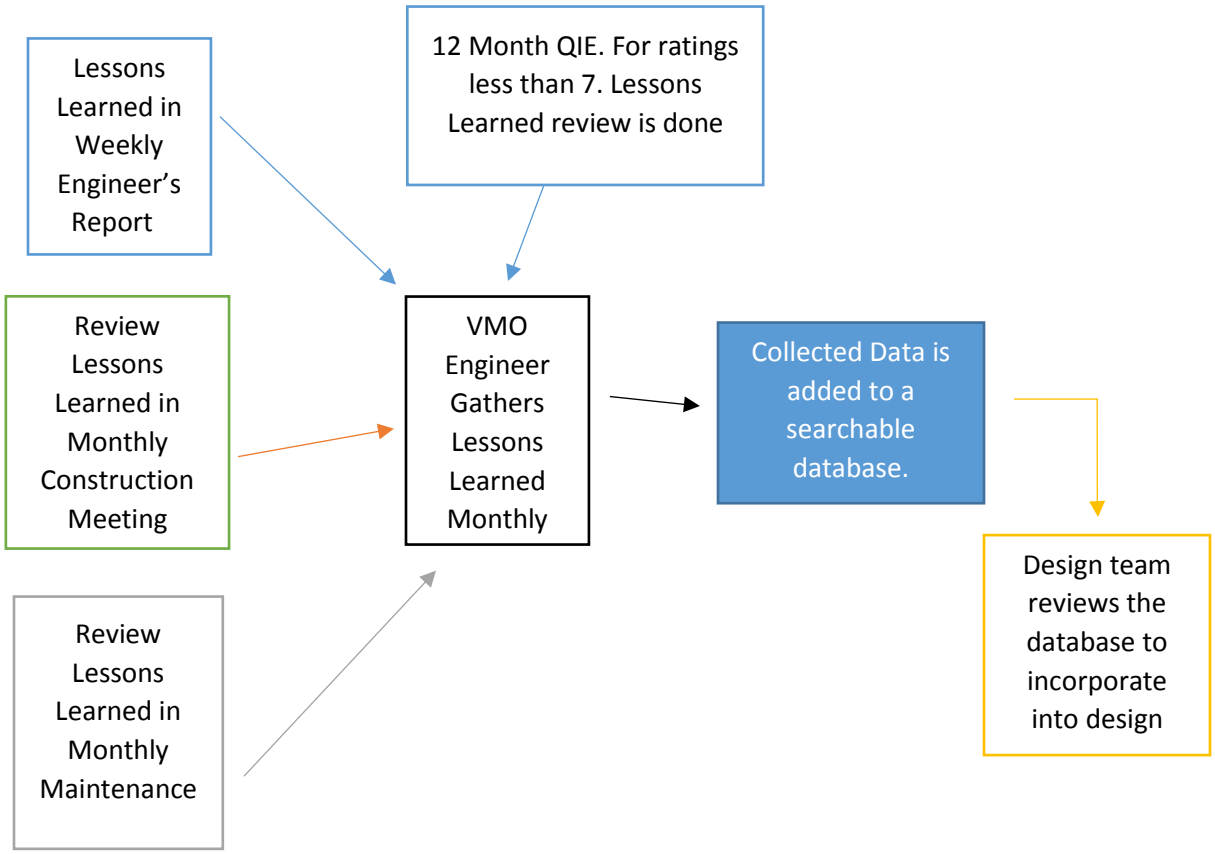
(2) DATA COLLECTION

The Value Management Office Engineer collects data from the meeting minutes and weekly engineer's reports in addition to the 12 month Construction Quality Index (CQI) - https://connect.ncdot.gov/projects/construction/Pages/RRMan.aspx?Order=RR-44. The collected data is inputted into a searchable database.

(3) DESIGN

Using the information provided in the Lessons Learned database, the design team uses this information to better the design.

c) Timeline



d) Output

The Value Management Office Engineer synthesizes the information and creates value in the lessons captured. The report is shared with Construction and any other departments included in the project from the beginning. Construction can then share the lessons on other projects where applicable.

e) Training

Training on how to complete the processes in the PCAP can be conducted by the Value Management Office Engineer on request. These trainings can be done in person or via a virtual platform.

C. Contact Personnel

1. State Value Management Engineer

The State Value Management Engineer is ultimately responsible for the overall management and direction of the VMO. Responsibilities include but are not limited to:

- Establishing and maintaining the VMO Guidelines and procedures to ensure the success of the VMO
- Developing annual work plans and establishing program goals
- Supervising the VMO Staff
- Serving as a liaison with Department Leadership and the various Business Units to identify and help resolve VMO challenges
- Determining multimodal transportation projects that would benefit from VMO services
- Providing analysis and synthesis of trends ascertained from the VMO Database
- Using performance measures to track the effectiveness of the VMO
- Effectively advertising the results of the VMO and recognizing individuals that make significant contributions to the VMO

2. Value Management (VMO) Engineer

The Value Management Office Engineer is responsible for the day-to-day management of the various VMO programs. There are currently five (5) Value Management Office Engineer's running the daily operations of the seven (7) programs.

3. Liaison

Each Division and Department office has nominated a liaison to coordinate all efforts between their Department and Division and the Value Management Office.

See Appendix H-1 for the list of Division Liaisons.

4. Contact

valuemanagementunit@ncdot.gov

919-707-4808

D. Acronyms

AASHTO – American Association of State Highway and Transportation Officials

Asset: An asset is defined as a useful or valuable thing for the program. There are three types: current – an up to date document, file, etc. that may not cost money except for employee time costs; fixed – an item that has a program costs, i.e. website, phone line, etc.; intangible – Natalie's bubbly personality.

CR – Constructability Review

CRP – Constructability Review Program

CQI – Construction Quality Index

Calendar Days – All days are counted as calendar days

Department – North Carolina Department of Transportation

Division – One of the 14 Divisions that make up the NCDOT

D-B – Design-Build is an alternative project delivery method that combines both the project design and the construction under one contract

FFY – Federal Fiscal Year

FHWA – Federal Highway Administration

Let Date – Date a project is let.

NCDOT – North Carolina Department of Transportation

NEPA –National Environmental Protection Agency

NHS – National Highway System

PCAP – Post Construction Assessment Program

PDEA – Project Development and Environmental Analysis

PEP – Product Evaluation Program

RA – Risk Assessment

RAP – Risk Assessment Program

ROW - Right of Way

RAP – Risk Assessment Program

RCP – Resource Conservation Program

SEPA – State Environmental Protection Agency

SMART- Specific, Measurable, Attainable, Realistic, Time-Based Goal

STIP – State Transportation Improvement Program

VE – Value Engineering is the systematic application of recognized techniques by a multi-disciplined team to identify the function of a product or service, establish a worth for that function, generate alternatives through the use of creative thinking, and provide the needed functions to accomplish the original purpose of the project and at the lowest life-cycle cost without sacrificing safety, necessary quality, and environmental attributes of the project. (Title 23 Code of Federal Regulations Part 627)

Proposal – Value Engineering Proposal is a proposal by a Contractor, as outlined by Section 104-12 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures, which encourages the Contractor to propose changes in the contract requirements which will accomplish the project's functional requirements at less cost or improve value or service at no increase or a minor increase in cost. The net savings of each proposal is shared with the Contractor at a 50% rate.

VEP – Value Engineering Program

VEPP – Value Engineering Proposal Program

VMO – Value Management Office within the Transportation Program Management Unit of the Technical Services Division of NCDOT

III. APPENDICES

Appendix A-1. 23 CFR Part 627

■ 3. Amend § 922.191(a) by revising the definition for "Traditional fishing" and adding the definition for "Traditional fishing rights" in alphabetical order to read as follows:

§ 922.191 Definitions.

(a) * * *

* * * * *

Traditional fishing means those commercial, recreational, and subsistence fishing activities that were customarily conducted within the Sanctuary prior to its designation or expansion, as identified in the relevant Final Environmental Impact Statement and Management Plan for this Sanctuary. Traditional fishing includes tribal fishing rights as provided for in the 1836 Treaty of Washington and subsequent court decisions related to the Treaty.

Treaty fishing rights means those rights reserved in the 1836 Treaty of Washington and in subsequent court decisions related to the Treaty.

* * * * *

■ 4. Revise § 922.197 to read as follows:

§ 922.197 Effect on affected federally-recognized Indian tribes.

The exercise of treaty fishing rights is not modified, altered, or in any way affected by the regulations promulgated in this Subpart. The Director shall consult with the governing body of each federally-recognized Indian tribe mentioned in the 1836 Treaty of Washington and in subsequent court decisions related to the Treaty regarding any matter which might affect the ability of the Tribe's members to participate in treaty fishing activities in the Sanctuary.

■ 5. Revise Appendix A to Subpart R of Part 922 to read as follows:

Appendix A to Subpart R of Part 922—Thunder Bay National Marine Sanctuary and Underwater Preserve Boundary Coordinates

[Based on North American Datum of 1983]

Point ID	Latitude (north)	Longitude (west)
1	44.512834	– 82.329519
2	44.858147	– 82.408717
3	45.208484	– 82.490596
4	45.335902	– 82.52064
5	45.771937	– 83.483974
6	45.773944	– 83.636867
7	45.833333	– 83.584432
8	45.833333	– 84.333333
9*	45.662858	– 84.333333
10*	45.41733	– 83.77327
11	45.42103	– 83.79487
12	45.42708	– 83.79371
13	45.42343	– 83.75318
14	45.41748	– 83.75333
15	45.41210	– 83.76805
16*	45.40738	– 83.76785
17*	45.29672	– 83.41908
18	45.29682	– 83.40965
19	45.29010	– 83.40965
20	45.29464	– 83.41914
21*	45.29681	– 83.42277
22*	45.06632	– 83.40715
23*	45.06560	– 83.40810
24*	44.511734	– 83.320169
25	44.512834	– 82.329519

Note: The coordinates in the table above marked with an asterisk (*) are not part of the sanctuary boundary. These coordinates are landward reference points used to draw a line segment that intersects with the shoreline for the purpose of charting the boundary.

[FR Doc. 2014–20965 Filed 9–4–14; 8:45 am]

BILLING CODE 3510–NK–P

DEPARTMENT OF TRANSPORTATION

Federal Highway Administration

23 CFR Part 627

[FHWA Docket No. FHWA–2013–0039]

RIN 2125–AF64

Value Engineering

AGENCY: Federal Highway Administration (FHWA), Department of Transportation (DOT).

ACTION: Final rule.

SUMMARY: The FHWA is updating the existing value engineering (VE) regulations to make them consistent with the statutory changes in the Moving Ahead for Progress in the 21st Century Act (MAP–21) and to make other non-substantive changes for clarity.

DATES: This final rule is effective October 6, 2014.

FOR FURTHER INFORMATION CONTACT: For technical information: Mr. Ken Leuderalbert, FHWA Utilities and Value Engineering Program Manager, FHWA Office of Program Administration, 317–226–5351, or via email at *ken.leuderalbert@dot.gov*. For legal questions, please contact Mr. William Winne, FHWA Office of the Chief Counsel, 202–366–1397, or via email at *william.winne@dot.gov*. Office hours for the FHWA are from 8:00 a.m. to 4:30 p.m., e.t., Monday through Friday, except Federal holidays.

SUPPLEMENTARY INFORMATION:

Electronic Access and Filing

This document, the notice of proposed rulemaking (NPRM), and all comments received may be viewed online through the Federal eRulemaking portal at: *http://www.regulations.gov*. The Web site is available 24 hours each day, 365 days each year. Please follow the instructions. An electronic copy of this document may also be downloaded by accessing the Office of the Federal Register's Web site at *http://www.archives.gov* or the Government Printing Office's Web site at *http://www.gpo.gov/fdsys/*.

Background

This final rule modifies the regulations that govern VE analyses in the planning and development of highway improvement projects due to recent changes to section 106(e) of title 23, United States Code. On July 6, 2012, MAP–21 (Pub. L. 112–141) was signed into law. Section 1503(a)(3) of MAP–21 amended 23 U.S.C. 106(e) by increasing the project monetary thresholds that trigger a VE analysis; eliminating the VE analysis requirement for design-build projects; and defining the requirements for a State Transportation Agency (STA) to establish and sustain a VE program.

The National Highway System Designation Act of 1995 directed the Secretary to establish a program that required States to carry out a VE analysis for all Federal-aid highway projects on the National Highway System (NHS) costing $25 million or more. On February 14, 1997, FHWA established the FHWA VE program and the requirement that STAs create and sustain a VE program at title 23, Code of Federal Regulations, part 627 (23 CFR 627). Section 1904 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA–LU) (Pub. L. 109–59) required that a VE analysis be conducted for bridge projects with an estimated total cost of $20 million or more and any other projects as determined by the Secretary of Transportation.

Section 1503(a)(3) of MAP–21 amends 23 U.S.C. 106(e) to modify the requirements for the value engineering program and raise the VE analysis requirement threshold to $50,000,000 or more for projects on the NHS that use Federal-aid Highway Program Funding assistance, and $40,000,000 or more for bridge projects on the NHS that receive Federal assistance. Section 1503(a)(3) removed the VE analysis requirement for design-build projects. In addition, MAP–21 defined the requirements for an STA to establish and sustain a VE program under which VE analyses are conducted on all applicable projects, consistent with the current regulations pertaining to STA VE Programs (as specified in 23 CFR 627.9).

Appendix A-2. Concurrence Points

Concurrence Points are defining points in the Section 404/NEPA Merger Process. Concurrence implies that each project team member and the agency they represent agrees to decisions made at these defining points in the project development process and in doing so pledges to abide by the decision made unless there is a profound changed condition. Concurrence is sequential and must be achieved in the proper order. The seven concurrence points (CP) in the Merger Process are as follows:

Concurrence Point 1: Purpose and Need and Study Area Defined

Purpose and Need and Study Area Defined: The foundation upon which justification of the project is established.

Concurrence Point 2: Detailed Study Alternatives Carried Forward (DSA)

Detailed Study Alternatives Carried Forward: Alternatives which satisfy the purpose and need for the project. These alternatives will be studied and evaluated in sufficient detail to ensure good transportation and permit decision-making.

Concurrence Point 2A: Bridging Decisions and Alignment Review

Bridging Decisions and Alignment Review: Identification of bridge locations and approximate lengths and a review of the preliminary alignment for each alternative.

Concurrence Point 3: LEDPA/Preferred Alternative Selection

LEPDA/Preferred Alternative Selection: The alternative selected as the "least environmentally damaging practicable alternative" or LEDPA (NEPA preferred alternative), through the project development and permitting process.

Concurrence Point 4A: Avoidance and Minimization

Avoidance and Minimization: A detailed, interdisciplinary and interagency review to optimize the design and benefits of the project while reducing environmental impacts to both the human and natural environment.

Concurrence Point 4B: 30 Percent Hydraulic Review

30 Percent Hydraulic Review; A review of the development of the drainage design.

Concurrence Point 4C: Permit Drawings Review

Permit Drawings Review: A review of the completed permit drawings after the hydraulic design is complete and prior to the permit application.
https://connect.ncdot.gov/resources/Environmental/Lists/Merger%20Process%20Guide/DispForm.aspx?ID=4

Appendix A-3. VE Recommendation Form SOP

North Carolina Department of Transportation

Transportation Program Management – Value Management

Value Engineering Program Recommendation SOP

Summary

The following guidelines provide direction on how to complete the Value Engineering Program Recommendation Form as a part of the Value Engineering Program.

This form needs to be completed by the Project Manager for the Project that was the subject of the Value Engineering Study. This form is needed for each Recommendation that is a part of the Value Engineering Study. This form must be submitted to the Value Management Office following Final Disposition and again at Implementation.

For general details on the guidelines of how to complete a Value Engineering Study refer to the Value Management Office guidelines - https://connect.ncdot.gov/resources/Products/Documents/VMO%20Guidelines%207.0.pdf

Form

Section 1: Project Details – To be filled out by the Value Management Engineer

The Value Management (VM) Engineer will fill out all of the project details provided during the Study. This includes a project description, Name and Contact of the Project Manager, and project details.

Section 2: Recommendation Description– To be filled out by the Value Management Engineer

The VM Engineer will fill out this section with information regarding the specific recommendation. The information must include recommendation number, a description of the current design in existing condition, recommendation description- including justification for the change, and reference any project document that shows the existing condition. Additionally, the VM Engineer will identify which Applicable Disciplines need to review the Recommendation prior to Final Disposition.

Section 3: Cost Analysis – To be filled out by the VM Engineer and verified by the Project Manager

This section should include the original material cost, original schedule, and life cycle costs as well as the changes put forth as part of the Value Engineering Recommendation and the total savings from the change if applicable. This section will be filled out by the VM Engineer but will need to be verified by the Project Manager.

Section 4: Conceptual Review Coordination – To be filled out by the Project Manager

The Value Management Engineer will fill out the Applicable Discipline column of the form based on the Applicable Disciplines in Section 2. The Project Manager, or the assistant to the Project

Manager, must contact Department personnel in each of these disciplines and receive comments on the Recommendation before making a Final Disposition. The personnel from each Applicable Discipline should be provided all documents necessary to complete a thorough review of the Recommendation. This section will be completed prior to section 5 but is placed on the last page of the Value Engineering Program Recommendation Form so that the summary of the Recommendation process can be viewed on one page.

Section 5: Summary of Recommendation Review – To be filled out by the Project Manager

This section includes all approvals from the Project Manager during the Recommendation Process. Following the Conceptual Review Coordination, the Project Manager, or assistant to the Project Manager, must sign off on its completion. After the Conceptual Review, a Final Disposition will be made on the Recommendation by the Project Manager. The final Recommendation status can be Accepted, Accepted as Modified, or Rejected. A summary of the findings, including the final reason as to why the disposition was made, should be provided in this section. The Project Manager must sign off on the decision and submit to Value Management - valuemanagementunit@ncdot.gov.

For an Accepted or Accepted as Modified Recommendation, the Recommendation shall be implemented into the final design. This Implementation must be followed-up by the Project Manager and confirmed. In order for Value Management to do an independent check for federal reporting requirements, details including project drawing or document (including applicable plan sheet numbers) that shows where the implementation was made should be provided in the comments. The Project Manager must sign off on the decision and submit to Value Management - valuemanagementunit@ncdot.gov.

North Carolina Department of Transportation
Transportation Program Management – Value Management
Value Engineering Program Recommendation Form

Section 1: Project Details (to be filled out by the VM Engineer)			
STIP No.		Project Description:	
WBS No.			
County			
Let Date		Project Lead	
R/W Est.		Name:	Contact:
Const. Est.			

Section 2: Recommendation Description (to be filled out by the VM Engineer)			
Recommendation Number			
Existing condition			
Recommendation Description			
Reference Project Document			
Applicable Discipline	☐ Construction ☐ Geotechnical ☐ Hydraulics ☐ Roadway ☐ Traffic Operations	☐ PDEA ☐ Utilities ☐ Structures ☐ Roadside Environmental ☐ Other:	☐ Right of Way ☐ Division ☐ Maintenance ☐ Planning

Section 3: Cost Analysis (to be filled out by the VM Engineer and verified by the Project Manager)			
	Material	Schedule	Life Cycle Costs
Original			
VE Recommendation			
Savings			

Section 5: Summary of Recommendation Review (to be filled out by the Project Manager)		
Conceptual Review	Sign Off	Comments (Coordination Details on following Page)
Final Disposition	Project Manager Sign Off	Comments
	Decision	
	☐ Accept ☐ Accept as Modified ☐ Reject	
Implement	Project Manager Sign Off	Explanation (Reference Project Document)

Section 4: Conceptual Review Coordination (to be filled out by Project Manager)			
Applicable Discipline	**Name**	**Contact**	**Comments**

Appendix A-4. Part 627 – Value Engineering

Code of Federal Regulations

Title 23 - Highways

Volume: 1
Date: 2013-04-01
Original Date: 2013-04-01
Title: PART 627 - VALUE ENGINEERING
Context: Title 23 - Highways. CHAPTER I - FEDERAL HIGHWAY ADMINISTRATION, DEPARTMENT OF TRANSPORTATION. SUBCHAPTER G - ENGINEERING AND TRAFFIC OPERATIONS.

Pt. 627

PART 627—VALUE ENGINEERING

Sec.

627.1 Purpose and applicability.
627.3 Definitions.
627.5 Applicable projects.
627.7 VE programs.
627.9 Conducting a VE analysis.

Authority: 23 U.S.C. 106(e), 106(g), 106(h), 112(a) and (b), 302, 315; and 49 CFR part 18.

Source: 77 FR 15254, Mar. 15, 2012, unless otherwise noted.

§ 627.1 Purpose and applicability.

(a) The purpose of this part is to prescribe the programs, policies and procedures for the integration of value engineering (VE) into the planning and development of all applicable Federal-aid highway projects.

(b) Each State transportation agency (STA) shall establish and sustain a VE program. This program shall establish the policies and procedures identifying when a VE analysis is required. These policies and procedures should also identify when a VE analysis is encouraged on all other projects where there is a high potential to realize the benefits of a VE analysis.

(c) The STAs shall establish the policies, procedures, functions, and capacity to monitor, assess, and report on the performance of the VE program, along with the VE analyses that are conducted and Value Engineering Change Proposals (VECP) that are accepted. The STAs shall ensure that its subrecipients conduct VE analyses in compliance with this part.

§ 627.3 Definitions.

The following terms used in this part are defined as follows:

Bridge project. A bridge project shall include any project where the primary purpose is to construct, reconstruct, rehabilitate, resurface, or restore a bridge.

Final design. Final design has the same meaning as defined in 23 CFR 636.103.

Project. A portion of a highway that a STA or public authority proposes to construct, reconstruct, or improve as described in the preliminary design report or applicable environmental document. A project is defined as the logical termini in the environmental document and may consist of several contracts, or phases of a project or contract, which are implemented over several years.

Total project costs. The costs of all phases of a project including environment, design, right-of-way, utilities and construction.

Value Engineering (VE) analysis. The systematic process of reviewing and assessing a project by a multidisciplinary team not directly involved in the planning and development phases of a specific project that follows the VE Job Plan and is conducted to provide recommendations for:

(1) Providing the needed functions, considering community and environmental commitments, safety, reliability, efficiency, and overall life-cycle cost (as defined in 23 U.S.C. 106(f)(2));

(2) Improving the value and quality of the project; and

(3) Reducing the time to develop and deliver the project.

Value Engineering (VE) Job Plan. A systematic and structured action plan for conducting and documenting the results of the VE analysis. While each VE analysis shall address each phase in the VE Job Plan, the level of analysis conducted and effort expended for each phase should be scaled to meet the needs of each individual project. The VE Job Plan shall include and document the following seven phases:

(1) *Information Phase:* Gather project information including project commitments and constraints.

(2) *Function Analysis Phase:* Analyze the project to understand the required functions.

(3) *Creative Phase:* 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:* Evaluate and select feasible ideas for development.

(5) *Development Phase:* Develop the selected alternatives into fully supported recommendations.

(6) *Presentation Phase:* Present the VE recommendation to the project stakeholders.

(7) *Resolution Phase:* Evaluate, resolve, document and implement all approved recommendations.

(g) *Value Engineering Change Proposal (VECP).* A construction contract change proposal submitted by the construction contractor based on a VECP provision in the contract. These proposals may improve the project's performance, value and/or quality, lower construction costs, or shorten the delivery time, while considering their impacts on the project's overall life-cycle cost and other applicable factors.

§ 627.5 Applicable projects.

(a) A VE analysis shall be conducted prior to the completion of final design on each applicable project that utilizes Federal-aid highway funding, and all approved recommendations shall be included in the project's plans, specifications and estimates.

(b) Applicable projects shall include the following:

(1) Each project located on the National Highway System (NHS) (as specified in 23 U.S.C. 103) where the estimated total project cost is $25 million or more that utilizes Federal-aid highway funding;

(2) Each bridge project located on or off of the NHS where the estimated total project cost is $20 million or more that utilizes Federal-aid highway funding;

(3) Any major project (as defined in 23 U.S.C. 106(h)), on or off of the NHS, that utilizes Federal-aid highway funding in any contract or phase comprising the major project;

(4) 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 letting which results in an increase in the project's total cost exceeding the thresholds identified in paragraphs (b)(1), (2) or (3) of this section; and

(5) Any other Federal-aid project the FHWA determines to be appropriate.

(c) An additional VE analysis is not required if, after conducting the VE analysis required under this part for any project meeting the criteria of paragraph (b) of this section, the project is subsequently split into smaller projects in the design phase or if the project is programmed to be completed by the letting of multiple construction projects. However, the STA may not avoid the requirement to conduct a VE analysis on an applicable project by splitting the project into smaller projects, or multiple construction projects.

(d) The STA's VE Program's policies and procedures shall identify when any additional VE analysis should be considered or conducted in the planning and development of transportation projects.

(e) For projects utilizing design-build and other alternative project delivery methods for which final design is not complete prior to the release of the final request for proposals or other applicable solicitation documents, the estimated total cost for purposes of the thresholds identified in paragraphs (b)(1) and (2) of this section, shall be based on the best estimate of the cost to construct the project.

§ 627.7 VE programs.

(a) The STA shall establish and sustain a VE program under which VE analyses are conducted for all applicable projects. The STA's VE program shall:

(1) Establish and document VE program policies and procedures that ensure the required VE analysis is conducted on all applicable projects, and encourage conducting VE analyses on other projects that have the potential to benefit from this analysis;

(2) Ensure the VE analysis is conducted and all approved recommendations are implemented and documented in a final VE report prior to the project being authorized to proceed to a construction letting;

(3) Monitor and assess the VE Program, and disseminate an annual report to the FHWA consisting of a summary of all approved recommendations implemented on applicable projects requiring a VE analysis, the accepted VECPs, and VE program functions and activities;

(4) Establish and document policies, procedures, and contract provisions that identify when VECP's may be used; identify the analysis, documentation, basis, and process for evaluating and accepting a VECP; and determine how the net savings of each VECP may be shared between the agency and contractor;

(5) Establish and document policies, procedures, and controls to ensure a VE analysis is conducted and all approved recommendations are implemented for all applicable projects administered by local public agencies; and ensure the results of these analyses are included in the VE program monitoring and reporting; and

(6) Provide for the review of any project where a delay occurs between when the final plans are completed and the project advances to a letting for construction to determine if a change has occurred to the project's scope or design where a VE analysis would be required to be conducted (as specified in 23 CFR 627.5(b)).

(b) STAs shall ensure the required VE analysis has been performed on each applicable project including those administered by subrecipients, and shall ensure approved recommendations are implemented into the project's plans, specifications, and estimate.

(c) STAs shall designate a VE Program Coordinator to promote and advance VE program activities and functions. The VE Coordinator's responsibilities should include establishing and maintaining the STA's VE policies and procedures; facilitating VE training; ensuring VE analyses are conducted on applicable projects; monitoring, assessing, and reporting on the VE analyses conducted and VE program; participating in periodic VE program and project reviews; submitting the required annual VE report to the FHWA; and supporting the other elements of the VE program.

§ 627.9 Conducting a VE analysis.

(a) A VE analysis should be conducted as early as practicable in the planning or development of a project, preferably before the completion of the project's preliminary design. At a minimum, the VE analysis shall be conducted prior to completing the project's final design.

(b) The VE analysis should be closely coordinated with other project development activities to minimize the impact approved recommendations might have on previous agency, community, or environmental commitments; the project's scope; and the use of innovative technologies, materials, methods, plans or construction provisions.

(c) For projects utilizing design-build and other alternative project delivery methods that will be advertised prior to the completion of final design, the STA or local public agency shall conduct a VE analysis prior to the release of the final Request for Proposals or other applicable solicitation documents.

(d) STAs shall ensure the VE analysis meets the following requirements:

(1) Uses a multidisciplinary team not directly involved in the planning or design of the project, with at least one individual who has the training and experience with leading a VE analysis;

(2) Develops and implements the VE Job Plan;

(3) Produces a formal written report outlining, at a minimum:

(i) Project information;

(ii) Identification of the VE analysis team;

(iii) Background and supporting documentation, such as information obtained from other analyses conducted on the project (e.g., environmental, safety, traffic operations, constructability);

(iv) Documentation of the stages of the VE Job Plan which would include documentation of the life-cycle costs that were analyzed;

(v) Summarization of the analysis conducted;

(vi) Documentation of the proposed recommendations and approvals received at the time the report is finalized; and

(vii) 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).

(e) For bridge projects, in addition to the requirements in paragraph (d) of this section, the VE analyses shall:

(1) Include bridge substructure and superstructure requirements that consider alternative construction materials; and

(2) Be conducted based on:

(i) An engineering and economic assessment, taking into consideration acceptable designs for bridges; and

(ii) An analysis of life-cycle costs and duration of project construction.

(f) STAs and local public agencies may employ qualified consultants (as defined in 23 CFR 172) to conduct a VE analysis. The consultant shall possess the training and experience required to lead the VE analysis. A consulting firm or individual shall not be used to conduct or support a VE analysis if they have a conflict of interest (as specified in 23 CFR 1.33).

(g) VECPs, STAs, and local public agencies are encouraged to use a VECP clause (or other such clauses under a different name) in an applicable project's contract, allowing the construction contractor to propose changes in the project's plans, specifications, or other contract documents. Whenever such clauses are used, the STA and local authority will consider changes that could improve the project's performance, value and quality, shorten the delivery time, or lower construction costs, while considering impacts on the project's overall life-cycle cost

and other applicable factors. The basis for a STA or local authority to consider a VECP is the analysis and documentation supporting the proposed benefits that would result from implementing the proposed change in the project's contract or project plans.

(h) Proposals to accelerate construction after the award of the contract will not be considered a VECP and will not be eligible for Federal-aid highway program funding participation. Where it is necessary to accelerate construction, STAs and local public agencies are encouraged to use the appropriate incentive or disincentive clauses so that all proposers will take this into account when preparing their bids or price proposals.

Appendix C-1. Activity List for Risk Identification

Using Risk Identification Handout select from the following list the project activity when the risk is most likely to occur.

1. Planning
2. Scoping
3. Preliminary Design
4. ROW/Utilities/RR
5. Final Design
6. Procurement
7. Construction
8. Operation
9. Replacement
10. Funding

Appendix C-2. Risk Assessment Overview

Objectives of Risk Assessment

Risk assessment is the process of quantifying the risk events documented in the risk identification stage. Risk assessment contains two aspects: risk frequency and consequence severity. Risk affects project outcomes in diverse ways. Risk effects are usually apparent in direct project outcomes by increasing costs or schedules. Some risks influence the project by affecting the public, public perception, the environment, or safety and health considerations. Risk can also affect projects in indirect ways by requiring increase planning, review, and management oversight activity. Risk assessment's primary objective is to systematically consider the risk events with their likelihood and consequences of their occurrence. Risk management is the practice used to identify, prioritize, and implement the strategies and changes discovered by completing a risk assessment.

Risk to Whom

A fundamental concept for any risk assessment is to ask "A risk to whom?" or "Whose risk is being assessed?" A typical transportation project has many participants. Some risks are carried by the construction contractor and others by the transportation agency or design firm. From the vantage point of a transportation agency everything is under the scope. Whether they hold certain risks or allocate it through a contract, the agency ultimately bears the risk and must understand where the risk exists.

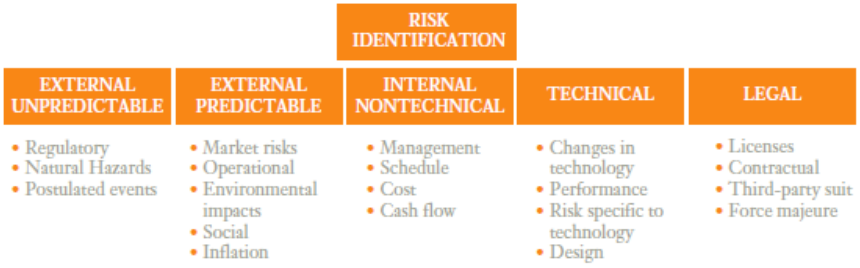
Sources of Risk

Although project risks are interrelated and interdependent, most risks spring from a definite origin. The customary origins for project risks are the following:

- Performance, scope, quality, or technology issues
- Environment, safety, and health concerns
- Scope, cost, and schedule uncertainty
- Political concerns

Foundations of Risk

While it is very useful to understand the source of the risk, it is equally important to recognize the foundations of risk. Each risk source can be categorized into different foundations. As an example, risks can be broken down into internal and external risks. Internal risks are usually items that are inherently valuable such as “what is the cost of concrete?” or “how long will it take to require the right-of-way?” External risks are items that are usuaully imposed on the project such as interactions from regulators or citzens. The figure below helps break down the foundations of risk.



Risk identification classification (adapted from Project and Program Risk Management: A Guide to Managing Project Risks, *Wideman 1992).*

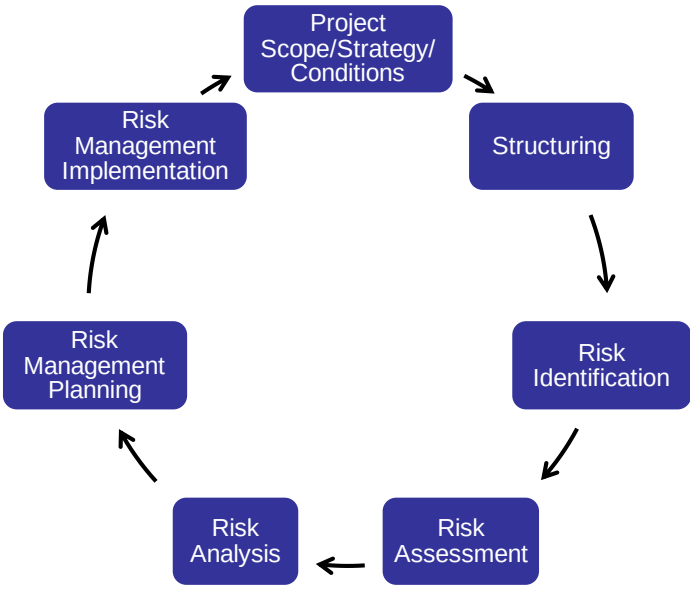
(Reference: Guide to Risk Assessment and Allocation for Highway Construction Management, 2006)

Conclusions

The goal of risk assessment is not to eliminate all risk from the project. The goal is to recognize the significant risk challenges to the project and to initiate an appropriate management response to their management and mitigation.

The Risk Management Process

The steps needed to conduct a risk assessment are the following:



(Reference: Guide for Managing Risks for Rapid Renewal Projects by Golder Associates Inc., 2010)

These steps will ensure the development of an efficient process capable of producing more accurate and defensible results. It is important for this process to be flexible due to the constant evolution and development of project details. It is also important for this process to be consistent with available information and expert judgment, as well as with existing project needs.

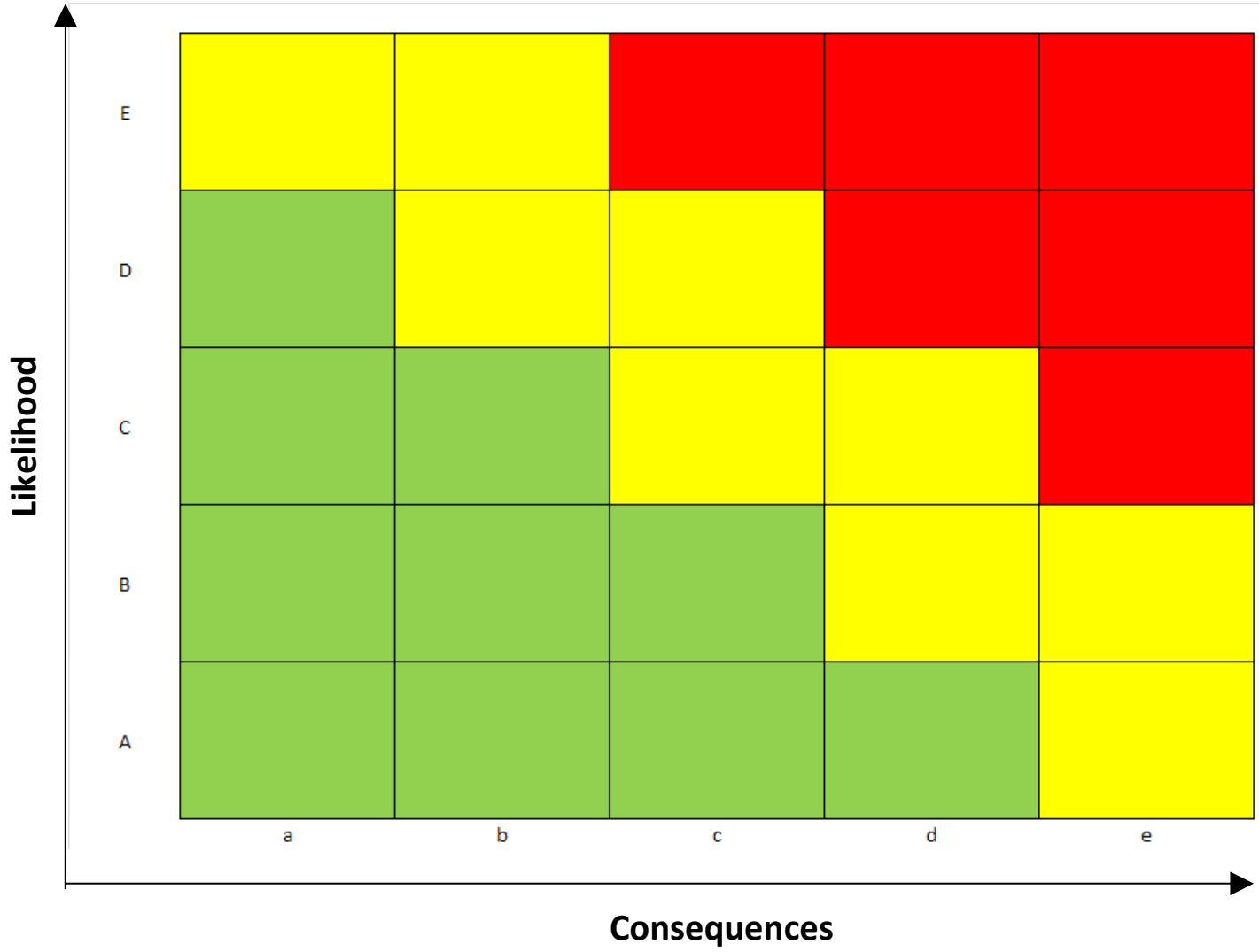
This table shows the time ranges from beginning alternatives analysis through construction completion and pinpoints many of the risk, objectives, and expected outcomes from these risks.

Project Phase	Status	Typical Risk Issue	Objectives For Risk Assessment	Expected Outcomes
Long-Range Planning/Programming	➢ Focus is on general alignment and mode ➢ Project details not defined; environmental reviews incomplete ➢ Funding possibly not committed ➢ Public support uncertain	➢ Fatal or significant environmental economic impacts ➢ Funding uncertainty ➢ Uncertain political and public support ➢ Competing interests and competing projects	➢ Identify implementation challenges-political, public acceptance, approvals ➢ Establish order of magnitude costs by option ➢ Identify major design and construction risks	➢ Better understanding of environmental, engineering, and construction issues facing each project alternative ➢ Order of magnitude risk costs and possible total cost range for each option
Preliminary Engineering	➢ Comprehensive definition of project goals ➢ Environmental reviews approaching completion (Record of Decision) ➢ Initial approvals received but long-term funding commitments still to be determined ➢ High cost and schedule contingencies	➢ Changes to project scope and budget ➢ Costs of environmental compliance ➢ Appropriate procurement methods ➢ Changes in design requirements ➢ Right-of-way acquisition ➢ Technical uncertainties ➢ Errors of omissions in quantities, inaccurate unit prices ➢ Market conditions ➢ Funding uncertainty	➢ Identification, quantification, and likelihood of major scope, budget, and schedule risks for all major project components ➢ General definition of and total probable project costs ➢ Risks of alternative design concepts, procurement methods	➢ List of major project risks ➢ Reasonable estimate of risk cost and probable total project costs and duration ➢ Long list of risk mitigation strategies ➢ Preliminary risk management plan, focused on design and constructability risks ➢ Preliminary risk allocation planning
Final Design	➢ Project goals communicated to contracting partners ➢ Project scope, cost, and schedule well defined ➢ Minor open issues since all cost and design detail well advanced ➢ Construction approvals, including permits and agreement, not yet final	➢ Changes to project scope and budget ➢ Errors or omissions in quantities, inaccurate unit prices ➢ Changes in design requirements ➢ Market conditions, permit requirements	➢ Identification, quantification, and likelihood of all identifiable scope, budget, and schedule risks for all project components ➢ Detailed definition of base costs, risk costs, and total probable project costs ➢ Validation of reasonableness of contingencies in project budget and schedule	➢ List of major critical risks, prioritization of risks based on impacts to total project cost and duration ➢ Costs/benefits of risk mitigation and risk allocation strategies ➢ Risk management and allocation plan
Construction	➢ Design complete; project defined ➢ Commitments (funding, policy, etc.) in place ➢ Construction in progress	➢ Contractor performance, construction quality ➢ Final permitting, right-of-way acquisition ➢ Unanticipated site/working conditions ➢ Field design changes ➢ Construction safety	➢ Targeted assessment of construction problems, causes, and potential cost/schedule impacts ➢ Identification and systematic evaluation of possible corrective actions	➢ Analysis of specific problems ➢ Costs/benefits of possible corrective actions ➢ Corrective action plan that will allow project sponsors/owners to maintain (or recover) schedule, and avoid cost overruns

(Reference: Guide to Risk Assessment and Allocation for Highway Construction Management, 2006)

Appendix C-3. Risk Screening Worksheet

Assessment Guide



Please label in the matrix above the 10 risks (A-J) previously identified based on matrix criteria discussed on the "Risk Screening" Handout

After completion, please transfer your classifications associated with each of the 10 risks to the Risk Identification Worksheet

Appendix D-1. GS136-18.04 Product Evaluation Program

PRODUCT EVALUATION PROGRAM/INCREASE INNOVATION

SECTION 29.11.(a) Plan. – The Board of Transportation shall develop a plan to bring greater visibility and public awareness to the Product Evaluation Program, a unit of the Department of Transportation that reviews new and innovative technologies and products. As part of its plan, the Board shall add to its monthly public meeting an agenda item that highlights two new technologies, one technology that is under review by the Product Evaluation Program and one technology that was recently approved by the Product Evaluation Program.

SECTION 29.11.(b) Report and Implementation. – The plan required under subsection (a) of this section shall be submitted to the chairs of the Joint Legislative Transportation Oversight Committee no later than December 1, 2015. The Board shall implement the plan required under subsection (a) of this section by February 15, 2016.

SECTION 29.11.(c) Chapter 136 of the General Statutes is amended by adding a new section to read:

"**§ 136-18.04. Product Evaluation Program.**

The Product Evaluation Program, or any successor program operated by the Department of Transportation to review and approve or disapprove new and innovative technologies and products for use by the Department, shall complete its evaluation of a technology or product within one year from the date that the technology or product was submitted for evaluation. Nothing in this section shall be construed as requiring the Product Evaluation Program or any successor program to review all technologies and products submitted to the Product Evaluation Program or any successor program."

SECTION 29.11.(d) Subsection (c) of this section becomes effective January 1, 2016, and applies to technologies and products submitted for review on or after that date. The remainder of this section is effective when this act becomes law.

Appendix D-2. Product Feedback Form v0.2 Reader

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PRODUCT EVALUATION PROGRAM

PRODUCT FEEDBACK FORM

Direct all questions regarding this feedback form to productevaluation@ncdot.gov or 919-707-4808.

INSTRUCTIONS

Please provide factual information related to your experience using a product or innovation on an NCDOT project, save the form, and submit the completed form and other supporting documentation/photos to productevaluation@ncdot.gov. Additional blank forms are available here.

PROJECT INFORMATION (Fill in at least ONE answer in this section to identify the project.)

NCDOT Contract Number/WBS: _____

Route or Location: _____

County/Counties/Division: _____

NCDOT Engineer/Contact: _____

Prime Contractor (Company Name): _____

Company Installing Product: _____

PRODUCT INFORMATION (Fill in at least the information marked with **.)

** **Product Name:** _____

Product Model: _____

Product Manufacturer: _____

Product Distributor: _____

Approved Products List NP Number: _____

Date(s) of Installation: _____

Identify Location Installed/Used: _____

Describe Product Use: _____

** **Observed Product Performance**: _____

Possible Reasons for Performance: _____

Recommendations for Future Use: _____

The name below certifies that the information herein is correct. Email to productevaluation@ncdot.gov.

Name _____

Date _____

Email _____

Phone _____ Ext _____

Last Revised: May 2017

Appendix D-3. Proprietary Approval Form Reader

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PROPRIETARY ITEM - CERTIFICATIONS OR FINDING IN THE PUBLIC INTEREST (FIPI)

INSTRUCTIONS:
A specific patented or proprietary material, specification, or process shall not be required on a contract except as permitted under the Procedures for Using Proprietary Items on NCDOT Projects Governed by CFR Title 23 Highways §635.411 or the NC General Statutes §133-3. Use this form to obtain approval of the use of a proprietary feature on a project or group of projects.

NAME OF PROPRIETARY ITEM OR PROCESS:

_____

MANUFACTURER NAME, ADDRESS & PHONE NUMBER:

_____

LOCATION OF USE (INCLUDE PROJECT NO. AND COUNTY):

_____

CHECK ONLY ONE:

- ○ Proprietary Item: Requires copy of data on at least 2 similar proprietary items or products. (Approval level is the State Contract Officer)
- ○ Essential for Synchronization or No Equally Suitable Alternate: Requires justification signed by designer or City Engineer (whoever sealed the plans). (Approval level is the Division Engineer)
- ○ Research/Test/Experimental Project (NCDOT only): Requires proposal and work plan submitted to the Office of Research and Development with signed verification from the Designer or Consultant that sealed the plans AND the Division Engineer (Approval level is the Research and Development Engineer)

Page **1** of **2**

JUSTIFICATION: (Justification consists of information that documents the reasons marked above for use of the proprietary item or process. Attach additional pages and documentation as necessary).

_____

APPLICANT SIGNATURE:

Name: _____

Title: _____

Signature: _____ Date: _____

APPROVAL SIGNATURES:

Signature	NCDOT State Contract Officer (Required on request for Proprietary Items)	Date
Signature	NCDOT Division Engineer (Required for projects essential for synchronization or no equally suitable alternative)	Date
Signature	NCDOT Research and Development Manager (Required for research / test / experimental projects	Date

Page **2** of **2**

Appendix E-1. GS 136-28.8 Rewrite

G.S. 136-28.8 Page 1

§ 136-28.8. Use of recycled materials in construction and environmentally sustainable practices.

(a) It is the intent of the General Assembly that the Department of Transportation continue to expand its use of recycled materials in its construction and maintenance programs.

(b) The General Assembly declares it to be in the public interest to find alternative ways to use certain recycled materials that currently are part of the solid waste stream and that contribute to problems of declining space in landfills. The Department shall, consistent with economic feasibility and applicable engineering and environmental quality standards, use:

(1) Rubber from tires in road pavements, subbase materials, or other appropriate applications.

(2) Recycled materials for guard rail posts, right-of-way fence posts, and sign supports.

(3) Recycling technology, including, but not limited to, hot in-place recycling, in road and highway maintenance.

(4) Recycled asphalt, provided that minimum content standards are met and the material meets minimum specifications for the project.

(c) As a part of its scheduled projects, the Department shall conduct additional research, which may include demonstration projects, on the use of recycled materials in construction and maintenance.

(d) The Department shall review and revise existing bid procedures and specifications to eliminate any procedures and specifications that explicitly discriminate against recycled materials in construction and maintenance, except where the procedures and specifications are necessary to protect the health, safety, and welfare of the people of this State.

(e) The Department shall review and revise its bid procedures and specifications on a continuing basis to encourage the use of recycled materials in construction and maintenance and shall, to the extent economically practicable, require the use of recycled materials.

(f) All agencies shall cooperate with the Department in carrying out the provisions of this section.

(g) On or before October 1 of each year, the Department shall report to the Division of Environmental Assistance and Outreach of the Department of Environment and Natural Resources as to the amounts and types of recycled materials that were specified or used in contracts that were entered into during the previous fiscal year. On or before January 15 of each year, the Division of Environmental Assistance and Outreach shall prepare a summary of this report and submit the summary to the Joint Legislative Commission on Governmental Operations and the Joint Legislative Transportation Oversight Committee. The summary of this report shall also be included in the report required by G.S. 130A-309.06(c).

(h) The Department, in consultation with the Department of Environment and Natural Resources, shall determine minimum content standards for recycled materials.

(i) This section is broadly applicable to all procurements by the Department if the quality of the product is consistent with the requirements of the bid specifications.

(j) The Department may adopt rules to implement this section. (1989, c. 784, s. 6; 1993, c. 256, s. 3; 1995 (Reg. Sess., 1996), c. 743, s. 9; 1997-443, s. 11A.119(a); 1999-237, s. 27.4; 2001-452, s. 3.6; 2010-31, s. 13.1(e); 2012-8, s. 1; 2012-200, s. 25.)

(k)The Department shall promote environmentally sustainable practices that preserve natural resources, conserve energy, eliminate waste and emissions, and lessen overall environmental impacts to the state's natural and human environments. The Department shall consider and minimize, where economically feasible, the environmental impacts associated with agency land use and acquisition, construction, maintenance and facility management through the collaboration with other state agencies, universities, community colleges and private industry to identify best practices and promote such practices through education, research, economic partnership, project development and demonstration all of which may be beneficial to the public and the state's economy.

Appendix G-1. PCAP Framework

The Post Construction Assessment Program

Version 1

The purpose of the Post Construction Assessment Program (PCAP) is to collect data on Lessons Learned during the life cycle of a project and share those lessons in a meaningful way to be incorporated into future projects.

Clare F. Griffith
cfgriffith@ncdot.gov

Post Construction Assessment Program Draft Plan
July, 2017

This is a draft plan and will continuously be monitored and updated as the program progresses.

Current update: July 13, 2017

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Contents

I. Introduction 3
II. Implementation Plan 4
A. Pilot study 4
B. Phase 1 4
C. Phase 2 4
D. Phase 3 4
E. Phase 4 4
III. Process 5
A. Pilot 5
B. Phase 1 5
C. Phase 2 5
D. Phase 3 5
V. Timeline 6
A. Pilot/Phase 1 6
B. Phase 2 6
C. Phase 3 7
IV. Output 7
VI. Construction Manual Links 8
VII. Training 8

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I. Introduction

The purpose of the Post Construction Assessment Program (PCAP) is to collect data on Lessons Learned during the life cycle of a project and share those lessons in a meaningful way to be incorporated into future projects. Lessons learned are activities that take place during construction that would result in a change in methodology, specification, design, provision, or procedure. This data includes both positive and negative activities that could have medium and long term implications beyond the immediate project. These lessons learned allow for NCDOT to adjust future cost estimates, update standards, and change policies to continuously strive to be an effective and efficient organization to the public.

In order to efficiently collect data in the PCAP, the Department must establish themes and trends to focus the data collection. These themes and trends are area the Department would like there to be a change to the status quo.

The Lessons Learned will be reviewed in an annual meeting with the whole department to ensure interdisciplinary review of the suggested changes. Changes that require Board of Transportation policy updates will be further developed and explored.

The PCAP is implemented and managed by the Value Management Office (VMO).

The program is under review and will continue to develop as it is implemented and researched.

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II. Implementation Plan

The PCAP will be implemented into the project cycle in four (4) phases following a Pilot study. Each phase will build on the next. The timeline from moving from one phase to the next is six (6) months to one year.

A. Pilot study

The Pilot study will kick off the PCAP program. A minimum of two (2) projects, but not more than four (4), will be selected to troubleshoot the best way to capture lessons learned without creating additional work for the Resident Engineer. This pilot study will allow the VMO to develop a searchable database in the most useful way. The pilot will pick a project that is getting let soon to incorporate the program from the beginning.

B. Phase 1

The PCAP will first be implemented at the Pre-Construction phase during the Pre-Construction conference. The selected contractor will be informed that Lessons Learned will be reviewed at each monthly meeting and at the project close-out. Specific trends that Design and Construction want feedback on will be discussed. First annual meetings via virtual platform will take place to review lessons learned captured and provide training on how to use database.

C. Phase 2

In addition to the inclusion of Phase 1, the Lessons Learned will be expanded to the Design Team. The Design Team will discuss Lessons Learned during their design process at their monthly meetings. Additionally, they will search the Lessons Learned Database to incorporate designs into their project.

D. Phase 3

In addition to the inclusion of Phases 1 and 2, the Lessons Learned collection will begin during the Right of Way portion of the project. The Lessons Learned will be included in monthly meetings. Maintenance will be incorporated into the collection and dissemination of information. Trends will be established by lead maintenance and monitored by personnel.

E. Phase 4

The final phase will include all of the previous phases, in addition to becoming a contract requirement for construction projects.

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III. Process

A. Pilot

- Two to four (2-4) projects will be selected to go through Phase 1 as described below.
- The database will be developed at this time.

B. Phase 1

- Design should provide suggested trends they would like feedback on.
- Construction should provide suggested trends they would like feedback on.
- At the pre-construction meeting with the selected contractor and all the stakeholders, the integration of lessons learned into the project meeting framework will be established.
- At each monthly construction meeting, lessons learned will be identified and possible solutions will be proposed. It is possible that some months there are five (5) or six (6) lessons learned, and other months there may only be one (1) lesson learned. The lessons learned should not be forced.
- The lead engineer developing the Engineer's report will review lessons learned and include them in their weekly report. All lessons learned should be provided, but the focus should be on the requested trends.
- Lessons learned database will be updated monthly.
- Use the Construction Quality Index (CQI) Evaluation to collect potential lessons learned on items with a rating of less than 7.
- Conduct first annual lessons learned review and training.

C. Phase 2

- Include Phase 1.
- The Design Team would implement lessons learned by searching the lessons learned database.
- During the design, the Design Team would review issues that arise during the design process and propose lessons learned on these issues. These lessons could include review procedures or design methods.

D. Phase 3

- Include Phase 1 and Phase 2.
- In between Phase 1 start and Phase 2 start, Phase 3 will be added. Phase 3 includes discussions of lessons learned during the utility relocation monthly meetings.
- The Maintenance Department will begin collecting lessons learned based on established trends.

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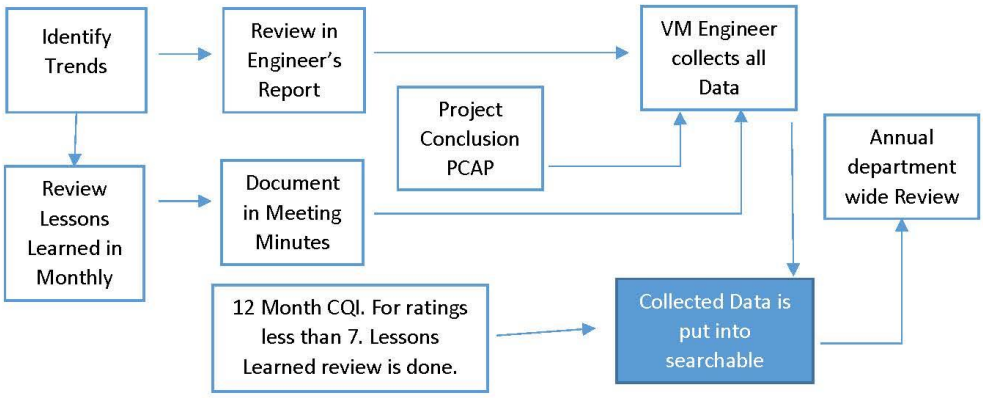
V. Timeline

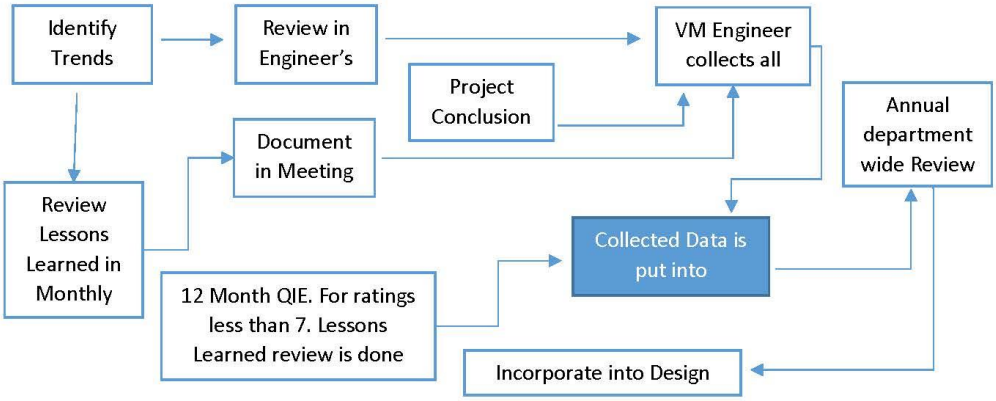
A. Pilot/Phase 1

Once the process has been established, the data collection will follow the following timeline.



B. Phase 2

Following phase 1 – data collection – the data will begin to be incorporated into the Design.



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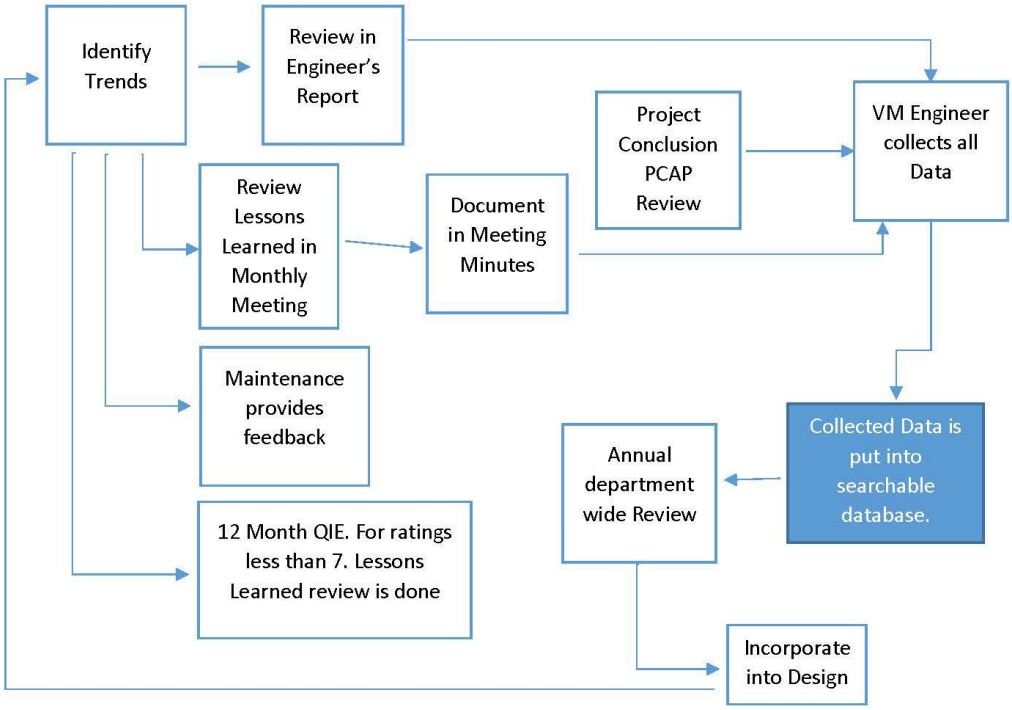
C. Phase 3

Following the successful implementation of the construction collected data into future design, maintenance data will begin to be collected.



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IV. Output

The Value Management Engineer collects the Engineer's reports and monthly meeting minutes to gather the lessons learned as the project is in progress. Lessons learned may also be submitted via email.

The lessons learned are organized in various categories – large scale and smaller, specific categories. The database will allow filtering through the following items:

1. Project Size [Small, Medium, Large]
2. Project Location
3. Specification/Drawing/Special Provision
4. Pay Items/Quantities
5. Trend

By making these categories, the lessons can easily be filtered and checked at any stage in the project. This will allow the Department to move forward in conjunction with the NCDOT Missions and Goals.

In addition, the contact information for the Resident Engineer associated with the project will be provided to connect the user to the person directly related to the lesson learned for additional information and insight. If pictures are available they will be linked to the appropriate lesson.

The sample database will be developed during the Pilot study.

VI. Construction Manual Links

CQI Reference: https://connect.ncdot.gov/projects/construction/Pages/RRMan.aspx?Order=RR-44

Engineer's Weekly Report:
https://connect.ncdot.gov/projects/construction/Pages/RRMan.aspx?Order=RR-07

Monthly Meeting Requirement:
https://connect.ncdot.gov/projects/construction/Pages/RRMan.aspx?Order=RR-04#MONTHLY%20CONSTRUCTION%20CONFERENCE

VII. Training

Training on how to complete the processes in the PCAP can be conducted by the Value Management Engineer on request. These trainings can be done in person or via virtual platform.

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Appendix H-1. Division Liaison List

This list was last updated on August 24, 2017.

Division Liaisons			Contact	
Division	*Name*	*Program*	*Email*	*Number*
Division 1	**Ryan Shook**	PEP, VEP, RCP	rlshook@ncdot.gov	252-482-1871
Division 2	**Ed Eatmon**	PEP, VEP, RCP	beatmon@ncdot.gov	252-439-2800
Division 3	**Anthony Law**	PEP, VEP, RCP	alaw@ncdot.gov	910-341-2000
Division 4	**Brandon Herring**	PEP, VEP, RCP	blherring@ncdot.gov	252-640-6410
Division 5	**Chris Hoffman**	PEP, VEP, RCP	cahoffman@ncdot.gov	919-220-4600
Division 6	**Davin Schmidt**	PEP, VEP, RCP	dschmidt@ncdot.gov	910-364-0600
Division 7	**Patty Eason**	PEP,VEP	peason@ncdot.gov	336-487-0000
Division 7	**Stanley Buff**	RCP	esbuff@ncdot.gov	336-487-0000
Division 8	**Sarah Foster**	PEP, VEP	sfoster@ncdot.gov	910-994-2344
Division 8	**Mary Helms**	RCP	mphelms@ncdot.gov	910-944-2344
Division 9	**Mark Crook**	PEP, VEP	mcrook@ncdot.gov	336-747-7800
Division 9	**Stephanie Braquet**	RCP	Scbraquet@ncdot.gov	336-747-7800
Division 10	**Rick Baucom**	PEP, VEP, RCP	rwbaucom@ncdot.gov	704-983-4400
Division 11	**Todd Spurlin**	PEP, VEP, RCP	tspurlin@ncdot.gov	336-903-9245
Division 12	**Jason Willis**	PEP, VEP, RCP	jlwillis1@ncdot.gov	704-480-9033
Division 13	**Rick Tipton**	PEP, VEP, RCP	rtipton@ncdot.gov	828-251-6171
Division 14	**Wesley Grindstaff**	PEP, VEP	wtgrindstaff@ncdot.gov	828-631-5481
Division 14	**Mitchell Bishop**	RCP	jmbishop@ncdot.gov	828-631-1143