NCDOT
Value Management Office
External Guidelines

Version 10.0
August 2019
I. Forward
The Value Management Office (VMO) has seven programs that are focused on enhancing project delivery at every phase of a project’s life. The programs work to bring innovation to NCDOT projects and engage every corner of the Department to share ideas and knowledge.

<table>
<thead>
<tr>
<th>Value Management Programs</th>
<th>Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Planning Phase</strong></td>
<td><strong>Design Phase</strong></td>
</tr>
<tr>
<td>Value Engineering Program (VEP)</td>
<td></td>
</tr>
<tr>
<td>Risk Assessment Program (RAP)</td>
<td></td>
</tr>
<tr>
<td>Product Evaluation Program (PEP)</td>
<td></td>
</tr>
<tr>
<td>Constructability Review Program (CRP)</td>
<td></td>
</tr>
<tr>
<td>Value Engineering Proposals (VEPP)</td>
<td></td>
</tr>
<tr>
<td>Resource Conservation Program (RCP)</td>
<td></td>
</tr>
<tr>
<td>Communicate Lessons Exchange Advice Record (CLEAR)</td>
<td></td>
</tr>
</tbody>
</table>
Contents
I. Forward ................................................................................................................................................. 2
II. External Guidelines ............................................................................................................................... 4
   A. About ............................................................................................................................................. 4
   B. Services Provided .......................................................................................................................... 4
      1. The Value Engineering Program (VEP) .................................................................................. 5
      2. The Value Engineering Proposal Program (VEPP) ............................................................... 10
      3. The Risk Assessment Program (RAP) ..................................................................................... 12
      4. The Product Evaluation Program (PEP) ............................................................................... 14
      5. The Resource Conservation Program (RCP) ......................................................................... 19
      6. The Constructability Review Program (CRP) ........................................................................ 21
      7. The Communicate Lessons Exchange Advice Record Program (CLEAR) ......................... 23
   C. Contact Personnel ....................................................................................................................... 24
      1. State Value Management Engineer ...................................................................................... 25
      2. Value Management (VMO) Engineer .................................................................................... 25
      3. Liaison ..................................................................................................................................... 25
      4. Contact ................................................................................................................................. 25
   D. Acronyms ....................................................................................................................................... 26
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 Communicate Lessons Exchange Advice Record Program (CLEAR)
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). 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 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 the discussion with Project Managers and other departments/units about VE studies to be completed during the upcoming Federal Fiscal Year (FFY), the VMO Engineers develop a schedule based on projects in the Statewide Transportation Improvement Program (STIP) that will be in the early phases of design during the current and following FFY. The STIP is updated every one to three years and the revisions are reviewed by the VMO engineers in coordination with the STIP unit. 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. The ideal time to conduct a VE Study is during or prior to 25%/30% design development.

Once the State VM 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 Project development schedule to ensure projects are completed early in the process to provide the best feedback.

The Value Management Office (VMO) has the following annual goals for FFY 2020:

<table>
<thead>
<tr>
<th>Federal Fiscal Year Criteria</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td># VE Studies Performed</td>
<td>10</td>
</tr>
<tr>
<td># Recommendations submitted</td>
<td>60</td>
</tr>
<tr>
<td># Recommendations approved</td>
<td>20</td>
</tr>
<tr>
<td>Estimated Cost Savings</td>
<td>$10 Mil</td>
</tr>
</tbody>
</table>

a) Personnel

The following VMO Engineers are principle on this program.

<table>
<thead>
<tr>
<th>Co-Lead</th>
<th>Clare Fullerton, PE</th>
<th><a href="mailto:cefullerton@ncdot.gov">cefullerton@ncdot.gov</a></th>
<th>919-707-6683</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-Lead</td>
<td>Haadi Sadaghiani</td>
<td><a href="mailto:hsadaghiani@ncdot.gov">hsadaghiani@ncdot.gov</a></td>
<td>919-707-6681</td>
</tr>
</tbody>
</table>
The annual VE Study List (List) is developed each year based on Code requirements using STIP list and the following procedure.

**Collect Projects for List**

1. Review projects on the current STIP - includes review of draft STIP (when available) and annual update
   [https://connect.ncdot.gov/projects/planning/Pages/State-Transportation-Improvement-Program.aspx](https://connect.ncdot.gov/projects/planning/Pages/State-Transportation-Improvement-Program.aspx)

2. Review bidding and letting documents (Note: 3rd Tuesday of the month is central letting)
   [https://connect.ncdot.gov/letting/Pages/default.aspx](https://connect.ncdot.gov/letting/Pages/default.aspx)

**Review if project meets financial threshold and NHS requirements**

3. Review projects that meet cost threshold of $40 Million with a structure, $50 million without a structure (Structure is defined as a Bridge; Culvert over 20’, pipe grouping over 20’, 54” pipe). Projects that have construction costs greater than $20 Million, and are on or intersecting with the NHS, are added to the draft list of required projects. If project is over $500 Million - needs to be included regardless if on the NHS. Design-Bid-Build and CMGC projects are excluded regardless of cost and location
   a. Costs can be found on the ZPR 25 report on SAP through EBS
      [https://www.ebs.nc.gov/irj/portal](https://www.ebs.nc.gov/irj/portal)

4. Confirm if the project is on (or intersects) the NHS - can view in the ARCGIs layer:
   [https://ncdot.maps.arcgis.com/home/webmap/viewer.html?useExisting=1&layers=b5e4863550324ed38890e802410fae77](https://ncdot.maps.arcgis.com/home/webmap/viewer.html?useExisting=1&layers=b5e4863550324ed38890e802410fae77)
   a. ARC GIS - overlay different things like STIP projects, NHS, evacuation routes etc. - it’s a handy tool.
   b. If project is over $500 Million, it needs to be included regardless if on the NHS.

If the project is on the NHS and/or meets the financial threshold, the VMO Engineer contacts the designated Design and planning staff to review the potential study list to gain feedback and determine the appropriate schedule. 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.

(2) 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.

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

(3) 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 VMO will follow up prior to final let to confirm the recommendation has been implemented.

c) Timeline

The following timeline is associated with the steps in 2 above.

- Invites to study. 1 month  VE Study Step 1-5  15 calendar days  VE Study Report Step 6  Varies  Resolution Step 7

(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” 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 and analysis of life-cycle costs and duration of project construction.

This Report is sent to NCDOT project 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 VMO Engineer requests receipt of the final disposition within 60 days.

(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 NCDOTs 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 be determined at the beginning of each FFY based on the needs of the department.
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) Engineer is principle on this program.

| Lead | Rosemary Brybag, PE | rbrybag@ncdot.gov | 919-707-6684 |

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. The review will take place after there has been confirmation from the Division that they want to pursue the proposal. These preliminary proposals are recommended so that the Contractor doesn’t spend extra time and resources on a final Proposal that would not have been accepted.

2. The preliminary proposal is then reviewed by the Resident Engineer’s office. The resident then can decide whether they would like to accept, reject, or ask more information about the proposal. If they accept it, they will then ask the Contractor to submit a final proposal.

3. Similar to the preliminary proposal, the final proposal will not be reviewed until there is confirmation from the Division that they want to pursue it. The Resident Engineer then reviews the final proposal. If the Contractor has gone through the preliminary proposal, then it makes this process easier.

4. Once the final proposal has been reviewed and accepted by the Resident Engineer, the Value Engineering office gets the necessary technical design units to review the proposal. If it is accepted, it is sent to the construction office for final approval.
5. If the construction office approves the proposal, the official acknowledgement gets sent back to the Resident engineer. A supplemental agreement is then made with the Contractor which includes a portion of the cost savings owed to the Contractor.

c) **Timeline**

<table>
<thead>
<tr>
<th>Optional Preliminary Proposal</th>
<th>Review</th>
<th>Final Proposal</th>
<th>Review</th>
<th>Agreement is made</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 days</td>
<td>Varies</td>
<td>20 days</td>
<td>Varies</td>
<td></td>
</tr>
</tbody>
</table>

**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.

<table>
<thead>
<tr>
<th>Role</th>
<th>Name</th>
<th>Email</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead</td>
<td>Haadi Sadaghiani</td>
<td><a href="mailto:hsadaghiani@ncdot.gov">hsadaghiani@ncdot.gov</a></td>
<td>919-707-6681</td>
</tr>
<tr>
<td>Support</td>
<td>Steven Bolyard</td>
<td><a href="mailto:sbolyard@ncdot.gov">sbolyard@ncdot.gov</a></td>
<td>919-707-6688</td>
</tr>
</tbody>
</table>

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 workshop 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:

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.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Request RA</td>
<td>1 month</td>
</tr>
<tr>
<td>Workshop</td>
<td>15 calendar days</td>
</tr>
<tr>
<td>Risk Report</td>
<td></td>
</tr>
</tbody>
</table>

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.
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. 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 online application located on the PEP website;
- 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.

<table>
<thead>
<tr>
<th>Co-Lead</th>
<th>Dan Snoke, PE</th>
<th><a href="mailto:dj.snoke@ncdot.gov">dj.snoke@ncdot.gov</a></th>
<th>919-707-6689</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-Lead</td>
<td>Steven Bolyard</td>
<td><a href="mailto:sj.bolyard@ncdot.gov">sj.bolyard@ncdot.gov</a></td>
<td>919-707-6688</td>
</tr>
</tbody>
</table>

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/ProductResources/Steps%20for%20Setting%20up%20NCID-US.pdf

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

The PEP Application is submitted via the website link provided here:
https://connect.ncdot.gov/site/ProductEvaluation/Pages/PE-default.aspx

Information on how to submit a product can be found here:
Should the customer lose their password or username, instruction on how to reset them can be found here:  
https://connect.ncdot.gov/resources/Products/ProductResources/Forgot%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 found online:  
https://connect.ncdot.gov/resources/Products/Documents/Product%20Feedback%20v0.2%20Reader.pdf
(3) TECHNICAL WORK GROUP EVALUATION PROCESS

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

Application received

Is it needed?

No: End process

Yes: Is there an NCDOT spec or provision related to this product?

No: Evaluation criteria made

Yes

Evaluate

During Evaluation can request additional information, conduct a field trial, test at M&T. Etc.

Send notification of Approved, Approved for Provisional Use, Requested Additional Information, Accepted for Field Trial Use, Unapproved

(4) 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.
(5) **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 notify 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.

(6) **RECERTIFICATION**

The PEP has a Recertification process to ensure the APL is 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.

(7) **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](https://connect.ncdot.gov/resources/Products/Pages/default.aspx)

(8) **PROPRIETARY**


(9) **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.

<table>
<thead>
<tr>
<th>Receive Application</th>
<th>Determine if going to Evaluate (send to TWG)</th>
<th>TWG 11 months</th>
<th>Evaluate</th>
<th>15 calendar days</th>
<th>Respond to Vendor</th>
</tr>
</thead>
</table>

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](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) Personnel

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

| Lead          | Steven Bolyard | sjbolyard@ncdot.gov | 919-707-6688 |

b) Process

Annual Recycling Reporting

The process for reporting and collecting the recycled material data is now online. Contractors (post project let) and division personnel shall use the following link to report material quantities:

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

The contractors and divisions report annually. 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 on the reporting form.

Coal Combustion Reporting

The process for contractors to submit a request to use Coal Combustion Products for embankment fill can be found online at the following location:

https://connect.ncdot.gov/resources/Products/ProductResources/Process%20for%20Utilizing%20Coal%20Combustion%20Products.pdf

The form that contractors will need to be filled out to request the use of Coal Combustion products is located online at the following location:

https://connect.ncdot.gov/resources/Products/ProductResources/Process%20for%20Utilizing%20Coal%20Combustion%20Products.pdf

c) 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.

d) **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.

<table>
<thead>
<tr>
<th></th>
<th>Name</th>
<th>Email</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead</td>
<td>Clare Fullerton, PE</td>
<td><a href="mailto:cefullerton@ncdot.gov">cefullerton@ncdot.gov</a></td>
<td>919-707-6683</td>
</tr>
<tr>
<td>Support</td>
<td>Dan Snoke, PE</td>
<td><a href="mailto:dsnoke@ncdot.gov">dsnoke@ncdot.gov</a></td>
<td>919-707-6689</td>
</tr>
</tbody>
</table>

b) Process

(1) PROJECT SELECTION

Projects are identified by the project manager during the design development phase. Projects of any size, type, location, and phase of project development can include a Constructability Review. The project managers request a constructability review from the Value Management Office.

i. Research

A research project kicks off in July 2019 with ECU and ITRE through the Research and Development office. This project is aimed at improving the Project Selection process, reviews and capturing of information. It will complete in 2021. Based on the results of this project, the process will change.

(2) CR TEAM SELECTION

CRs utilize a multi-disciplined team of Department and Private Engineers and Private Construction Contractors to provide input on the constructability challenges associated with each project. Additionally, Division and regional construction personnel are included in the discussion to provide their expertise and familiarity. 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. The review will take place at the project site if necessary for a site visit.

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.

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.
The Communicate Lessons Exchange Advice Record Program (CLEAR)

The purpose of the Communicate Lessons, Exchange Advice, Record (CLEAR) Program is to collect Best Management Practices and Lessons Learned from NCDOT employees so that this information can be shared with others. The lessons are sent through to the Gatekeeper at the Value Engineering office. They are then vetted by subject matter experts (SMEs) who are also leaders in their respective fields at NCDOT. The CLEAR program is designed to achieve feedback loops with NCDOT between operations, maintenance, construction, design, and planning. In addition to this, CLEAR is hoping to collect and store institutional knowledge.

CLEAR website: [https://connect.ncdot.gov/site/lessons-learned/Pages/default.aspx](https://connect.ncdot.gov/site/lessons-learned/Pages/default.aspx)

**a) Personnel**

The following VMO Engineers are principles on this program.

<table>
<thead>
<tr>
<th>Lead</th>
<th>Clare Fullerton, PE</th>
<th><a href="mailto:cefullerton@ncdot.gov">cefullerton@ncdot.gov</a></th>
<th>919-707-6683</th>
</tr>
</thead>
</table>

**b) Process**

CLEAR Lessons Learned Workflow

[Diagram of CLEAR Lessons Learned Workflow]

- Completed IL Form submitted to SharePoint
- Acknowledgement sent to submitter and to Gatekeeper
- Gatekeeper sends Review of IL/Best Practice Report to submitter or sends to Task Force for comments
- If submitted receives comments, then Gatekeeper sends additional information to submitter or sends to Task Force for comments
- Task Force provides additional information to submitter or sends to Task Force for comments
- Under Review
- Gatekeeper informs submitter of new IL and sends to primary beneficiaries (Submitter & Task Force)
- Under Review notice is sent to submitter

Submitted is sent rejection email.
a) Timeline

- Input Lessons: 15 days
- Gatekeeper Review: 90 days
- SME provide feedback

b) Output

The lesson is published on the CLEAR website under Approved.

Approved submissions can be found here: [https://connect.ncdot.gov/site/lessons-learned/Pages/Approved.aspx](https://connect.ncdot.gov/site/lessons-learned/Pages/Approved.aspx)

c) Training

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

Previously recorded training can be found on the Internal VMO Website:

[https://inside.ncdot.gov/TransportationServices/Valuemanagement/Pages/Post-Construction-Assessment-Program.aspx](https://inside.ncdot.gov/TransportationServices/Valuemanagement/Pages/Post-Construction-Assessment-Program.aspx)
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 Office (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.

4. Contact
valuemanagementunit@ncdot.gov

| State VM Engineer | Alyson Tamer, PE, CPM | awtamer@ncdot.gov | 919-707-6682 |
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 – Clare’s bubbly personality.

CLEAR – Communicate Lessons, Exchange Advice, Record

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

CLEAR – Communicate Lessons Exchange Advice Record 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