

### **NORTH CAROLINA** Department of Transportation



How does VMO bring extraordinary value to your everyday needs? Alyson Tamer, PE, CPM

April 7, 2022

# **Commonly Used Acronyms**

VMO- Value Management Office

CLEAR- Communicate Lessons, Exchange Advice, Record

PCA- Post Construction Assessment

**VEP-Value Engineering Proposal** 

**CR-** Constructability Review

**RAW- Risk Assessment Worksheet** 

**VE- Value Engineering** 

# **Five Main VMO Programs**



CLEAR Program



Value Engineering Proposal Program



Risk Assessment Program



Constructability Review Program



Value Engineering Program

# What is Value Engineering?

VE is an organized application of <u>common sense and</u> <u>technical knowledge</u> directed at <u>finding and developing</u> <u>alternative ideas</u> that can optimize the cost and performance of a project (add value to a project).



# VE Studies Required on Design-Bid-Build projects & CMGC if:



TOTAL project costs\* >\$50M -on or intersecting with the NHS -Projects without structure(s)



TOTAL project costs\* > \$40M -on or intersecting with the NHS -Project <u>with</u> Structure(s)



Major Projects -Anywhere (on or off the NHS) -TOTAL project costs\* > \$500M

\*Total Project Costs includes construction, ROW, Utility also if 2 Projects are Let together

# **VE Study Participant Responsibilities**

Attend the VE Study and work through required steps of the Study, mainly identifying and developing ideas.







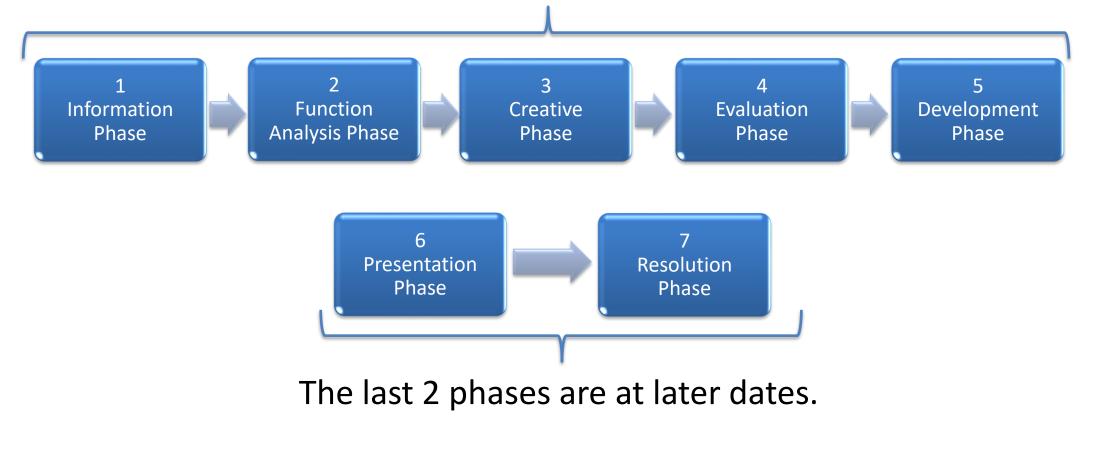
Work collaboratively

Stay open minded

Consult with the team facilitator on any roadblocks encountered

# Value Engineering Study Phases

The First 5 Phases are applied during the VE Study



**Benefits** 

# **Constructability Review Program**



- Provide collaboration between design and construction
- Provide contractor input on design issues (coordinate with contractors)
- Identify potential cost savings and mitigation strategies to help reduce risk

# **Risk Assessment Program**

# Risks are uncertainties that can impact a project



Risk management is a proactive process designed to <u>minimize potential obstacles</u> and maximize the ability to capitalize on opportunities.

# **Risk Assessment Program**

- 1. Risk Assessment Worksheet (RAW)
  - Identify maintenance related risks during design
  - Use it to identify risks in your work
- 2. Risk Register (CLEAR Database)





Risk Assessment Program Website

# What does CLEAR stand for? **C**ommunicate Lessons, Exchange Advice, Record

# CLEAR is...

### Employee Driven

Knowledge Management Program

Knowledge gathering and

knowledge *sharing* 

### CLEAR is a tool for NCDOT

# What CLEAR does?









Feedback loops created between regions and units.



Innovations shared and vetted.



Institutional knowledge stored.



Ideas on any topic related to NCDOT.



Approved submissions searched and shared.



Enhanced communication and knowledge share.

Welcome To CLEAR

# Who can submit?



This is the online submission portal for the CLEAR Program, the Department's Internal Knowledge Management Program. This portal is open to all NCDOT employees with an NCDOT email. If this is your first time here or would like a refresher on how the portal and overall program works, please visit the CLEAR Program

Connect Page for overview videos and additional background material: CLEAR Program (ncdot.gov). We aim to have all submission vetted within 30 days. Please contact the CLEAR team at CLEAR@NCDOT.GOV with any questions. The practices and ideas shared here represent accepted submissions from NCDOT employees, and do not in any case supersede official procedures, best practices or otherwise approved guidance.

NCDOT Employees with emails can share Lessons Learned In the CLEAR Portal

Search Accepted Lessons Learned and Best Practices Here: Share Lessons Share Best Request Assistance with an Obstacle Practice/Idea Learned Do you have a Lesson Learned to Do you have a best practice to This review will be completed share? Have you met an obstacle share with the Department? Do within 2 weeks. Do you have an you have an idea of something issue, problem, or obstacle that and solved the issue? that could be used in the you need assistance in solving? Department?



Share Best Practice/Idea Request Assistance with an Obstacle

		CLEAR	Best Practice or	ldea	
Name:					
Office:					
Email:					
Phone:					
Note: Nan will not be			get back in case of needi	ing additional informatior dea	<ol> <li>Contact information</li> </ol>
Best Prac	tice description or idea				
Describe a	best management p	ractice or idea that coul	d be used in the departn	nent	
Examp	les of solution in practice				

No

Yes

o you wish to be a part of

is effort?

# What about those without emails?

2022 Preconstruction Conference

# What happens to a submission?



## LL or BP Submitted



## VMO Reviews



Experts provide expertise and guidance



Accepted submissions can be searched

### CLEAR

- ➔ Accepted Lessons Learned
- ➔ Accepted Best Practices
- ✤ Knowledge Transfer Best Practices
- ➔ Gatekeepers and Experts
- ➔ Search Lessons Learned & Best Practices

### Communicate Lessons, Exchange Advice, Record



EAR

Learn about our winners of the 2021 CLEAR Innovation Challenge and more by watching this short video: https://youtu.be/CAxT4gDu7yk

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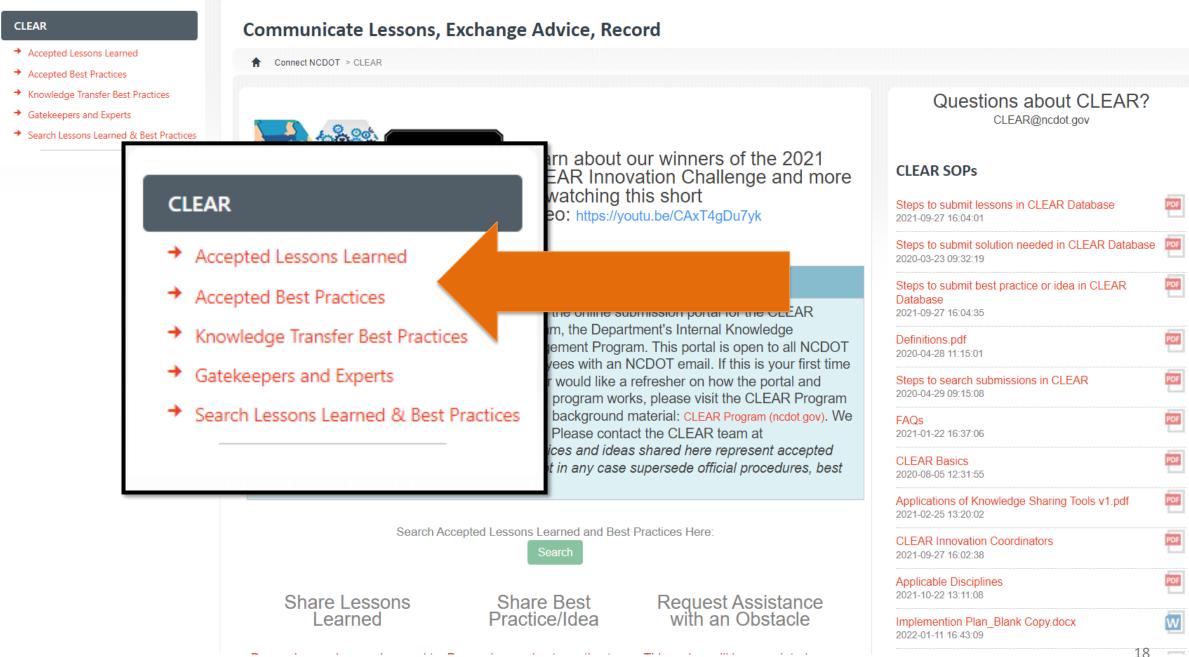
Search Accepted Lessons Learned and Best Practices Here:

Share Lessons Learned Share Best Practice/Idea Request Assistance with an Obstacle

### Questions about CLEAR? CLEAR@ncdot.gov

### **CLEAR SOPs**

Steps to submit lessons in CLEAR Database 2021-09-27 16:04:01	PDF
Steps to submit solution needed in CLEAR Database 2020-03-23 09:32:19	PDF
Steps to submit best practice or idea in CLEAR Database 2021-09-27 16:04:35	PDF
Definitions.pdf 2020-04-28 11:15:01	PDF
Steps to search submissions in CLEAR 2020-04-29 09:15:08	PDF
FAQs 2021-01-22 16:37:06	PDF
CLEAR Basics 2020-08-05 12:31:55	PDF
Applications of Knowledge Sharing Tools v1.pdf 2021-02-25 13:20:02	PDF
CLEAR Innovation Coordinators 2021-09-27 16:02:38	PDF
Applicable Disciplines 2021-10-22 13:11:08	PDF
Implemention Plan_Blank Copy.docx 2022-01-11 16:43:09	w
17	_



CLEAR • Accepted Lesson	ns Learned	
★ ► Connect NCDOT ► CLEAR		
CLEAR	• new item        Accepted     Construction       All Items         Find an item	
Accepted Best Practices	U Title ID Describe the issue, problem, or obstacle you encountered Applicable Discipl	ines Rating (0-5)
<ul> <li>Knowledge Transfer Best Practices</li> <li>Gatekeepers and Experts</li> </ul>	Lessons Learned 6 Motorists taking the US 52 SB exit ramp onto SR 1815 had limited sight distance at the top of the ramp due to new guardrail location tied to bridge. Issue was discovered after final acceptance. Maintence used on call guardrail contractor to reinstall and charged to the project. Roadway Design; Tr Mobility & Safety	ansportation ☆☆☆☆☆ 0
<ul> <li>→ Search Lessons Learned &amp; Best Practices</li> <li>▲          ▲ Accepted Lessons Learned     </li> <li>▶          ④ Division     </li> <li>▶          ④ Region     </li> </ul>	Lessons Learned 7 Firm went out and counted traffic for a traffic analysis. We got the data from third party recommentation and presented the data to the stakeholders at a time that impacted the schedule. We should have come up with the analysis 12 months ago and understand clearly what the stakeholder wanted from the project because the traffic analysis did not meet the needs of the stakeholders. Cause a schedule impact - 12 months of delay due to lack of Project Management coordination	t; Local Projects 🏠 ☆ ☆ ☆ ☆ 👌
▷ P County ▷ P Cost Impact	Lessons Learned Bridges with heavy skews, vertical curves, and/or horizontal curves can end up with reduced cover to the reinforcing steel in the deck due to screeding. Construction; Structures Constructures Constructures Constructures Constructures Constructures Constru	ures ☆☆☆☆ 0
<ul> <li>▷ I Cost impact</li> </ul>	Lessons Learned 9 Traffic control plans required that Phase I of the widening to take place on one side of the roadway. This widening would block the existing drainage systems until Phase II work was completed and obliterated the old system. These locations are distributed throughout the project. Hydraulics; Work Zo	57 57 57 57 57 10
▷ 🗇 Project Phase	Lessons Learned 10 Large gaps - Seperation of foam from the other at the joints. Any joint above an inch and half is a large gap. The seperation occurs in as quickly as four weeks. In an absolute perfect situation, it can last up to a year. It is not cost effective to replace joints once a year or sooner. This causes a maintenance issue. Lane closure costs on both sides. Cones/arrows.	nent; ☆☆☆☆☆ 0
Key Filters	Lessons Learned 11 Contract surveying was left out of project tasks (grey area). Planning phase should have had contract surveying. On this project utilities were deep and drainage was deep; utilities were a nightmare on this project. Utilities were located but were not picked up, so many utilities out there and they were stacked. There were abandoned lines. Utilities were and they were abandoned lines.	oject ☆☆☆☆☆ 0
Division 🗸	Lessons Learned <sup>12</sup> The existing 15" drainage pipe was not in the location as noted on the plans. The new drainage structure could not be place until a redesign was done for the existing drainage pipe. Contractor had to wait for a redesign and overrun on pipe quantities Project Management	t ☆☆☆☆☆ 0
Region	Lessons       13       Lack of construction easement as well prevented contractor from having adequate space to work. Had to utilize steel plate covers and message boards to work in lanes.	t ☆☆☆☆☆ 0

### ncdot.aov

#### CLEAR Communicate Lessons, Exchange Advice, Record ➔ Accepted Lessons Learned ★ Connect NCDOT > CLEAR Accepted Best Practices Knowledge Transfer Best Pra Questions about CLEAR? Gatekeepers and Experts CLEAR@ncdot.gov Search Lessons Learned & Be CLEAR winners of the 2021 **CLEAR SOPs** on Challenge and more short PDF Steps to submit lessons in CLEAR Database e/CAxT4gDu7yk Accepted Lessons Learned 2021-09-27 16:04:01 PDF Steps to submit solution needed in CLEAR Database 2020-03-23 09:32:19 Accepted Best Practices PDF Steps to submit best practice or idea in CLEAR Database sion portal for the CLEAR 2021-09-27 16:04:35 Knowledge Transfer Best Practices 's Internal Knowledge PDF Definitions.pdf his portal is open to all NCDOT 2020-04-28 11:15:01 Gatekeepers and Experts DT erail. If this is your first time PDF n how the portal and Steps to search submissions in CLEAR Search Lessons Learned & Best Practices + PDF ere represent accepted PDF **CLEAR Basics** rseo, official procedures, best 2020-08-05 12:31:55 PDF Applications of Knowledge Sharing Tools v1.pdf 2021-02-25 13:20:02 Search Accepted Lessons Learned and Best Practices Here: PDF **CLEAR Innovation Coordinators** 2021-09-27 16:02:38 PDF Applicable Disciplines 2021-10-22 13:11:08 Share Lessons Share Best Request Assistance with an Obstacle Practice/Idea Learned Implemention Plan Blank Copy.docx W 2022-01-11 16:43:09

### CLEAR · Search

♠ ► Connect NCDOT ► CLEAR ► Accepted Lessons Learned & Best Practices Search

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- Practices

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♠ ► Connect NCDOT ► CLEAR ► Accepted Lessons Learned & Best Practices Search

Search	Lessons	Learned	&	Best	Practices

Search

There are 200 Lessons & Best Practices.

### Lessons Learned #6

Motorists taking the US 52 SB exit ramp onto SR 1815 had limited sight distance at the top of the ramp due to new guardrail location tied to bridge. Issue was discovered after final acceptance. Maintence used on call guardrail contractor to reinstall and charged to the project. (Submitted on 2/26/2020)

County: Surry | Region: Western

Applicable Disciplines: Roadway Design | Transportation Mobility & Safety

### Lessons Learned #7

Firm went out and counted traffic for a traffic analysis. We got the data from third party recommentation and presented the data to the stakeholders at a time that impacted the schedule. We should have come up with the analysis 12 months ago and understand clearly what the stakeholder wanted from the project because the traffic analysis did not meet the needs of the stakeholders. Cause a schedule impact - 12 months of delay due to lack of coordination (*Submitted on 2/26/2020*)

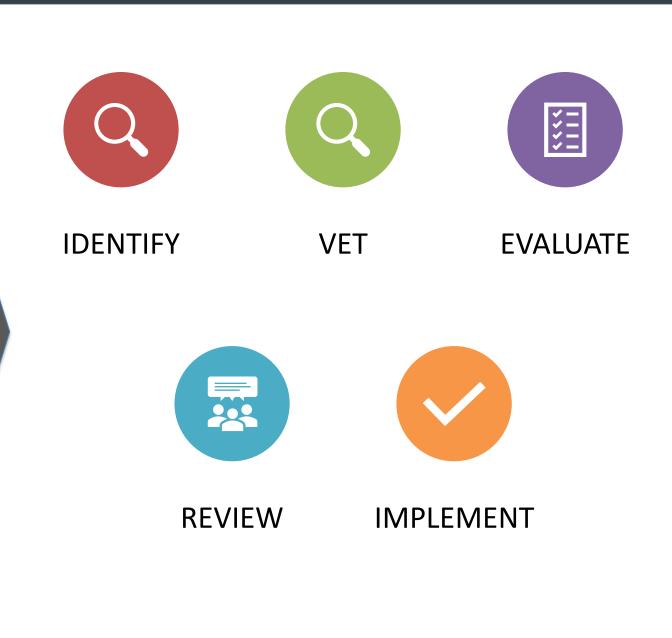
Applicable Disciplines: Project Management | Local Projects

### Lessons Learned #8

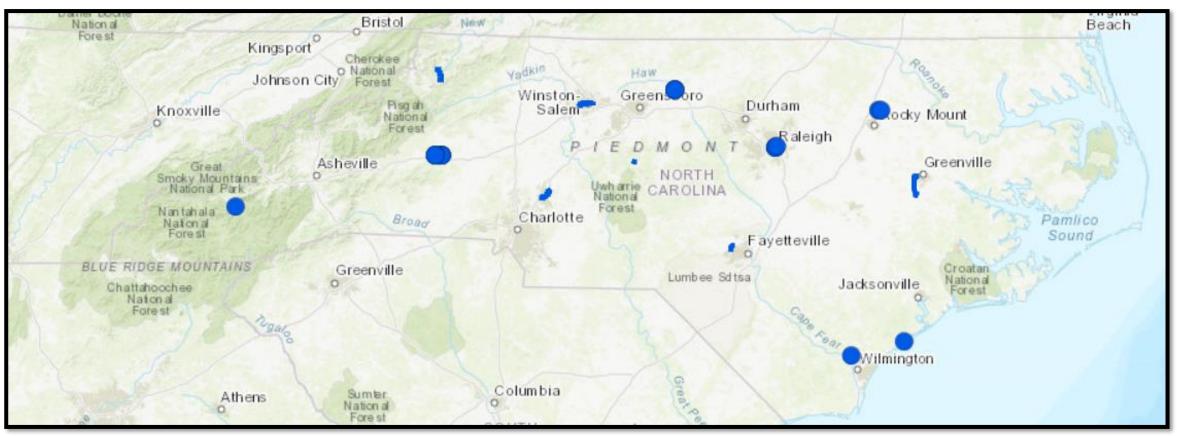
Bridges with heavy skews, vertical curves, and/or horizontal curves can end up with reduced cover to the reinforcing steel in the deck due to screeding. (Submitted on 2/26/2020) County: Wake | Region: Central

Applicable Disciplines: Construction | Structures Management

# How is an idea implemented?



# **Post Construction Assessments**



# We had 16 PCAs last year spread across the state.

# What did we learn?







# What did we learn?



### **330 unique individuals participated in the 16 PCAs!**

# We are processing almost 150 unique lessons learned and best practices through our CLEAR portal and implementation pathways.

# **Greenville Southwest Bypass**



# **Fayetteville Outer Loop**



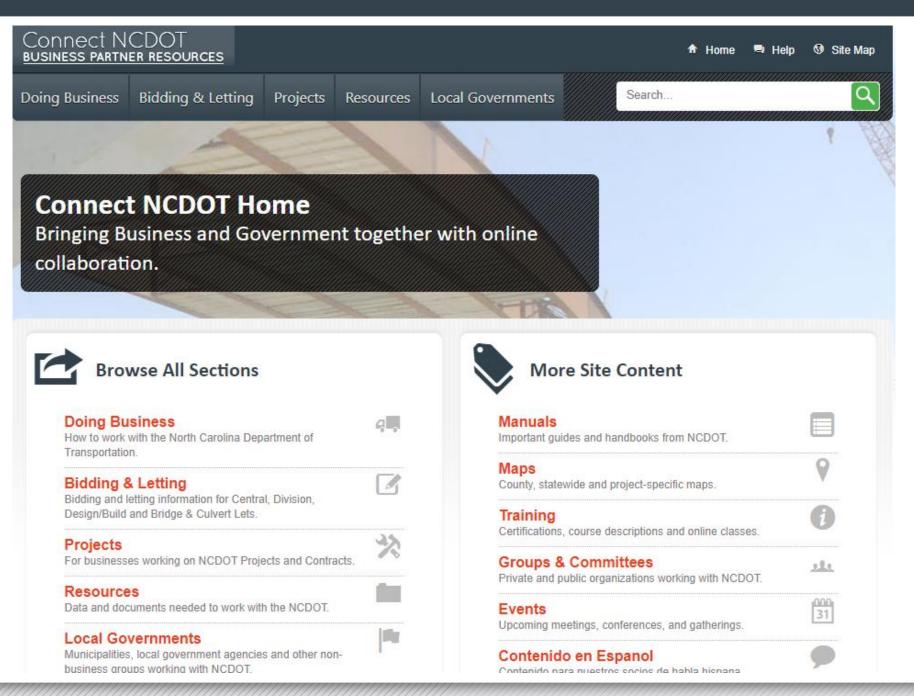


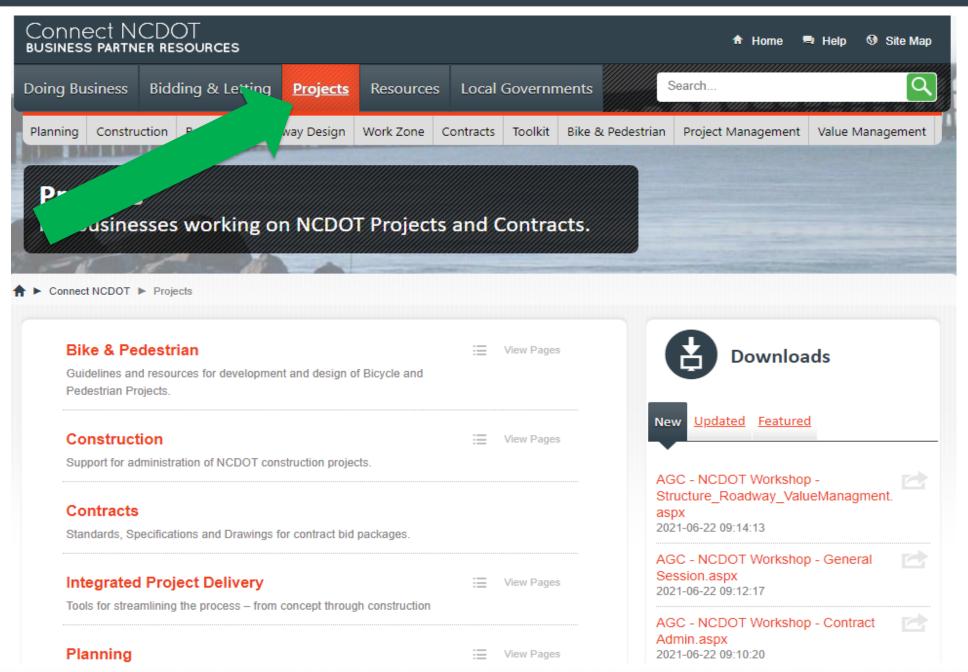
# **Design with Maintenance in Mind**

Lunch and Learn sharing Maintenance considerations

Volunteers needed!







	ect NCE <u>partner</u> i						🕈 Home	🛡 Help	🞯 Site Map	
Doing Bu	siness Bi	idding & Let	ting <u>Projects</u>	Resource	s Local	Governn	nents	Search		9
Planning	Constructio	n Research	Roadway Design	Work Zone	Contracts	Toolkit	Bike & Pedestrian	Project Managem	Value N	Management

### Value Management Office

The Value Management Office (VMO) has five 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 the Department to share ideas and knowledge.

🕈 🕨 Connect NCDOT 🕨 Projects 🕨 Value Management



### **CLEAR Program**

The CLEAR Program collects lessons learned, innovative ideas, and best management processes to be shared throughout the Department.

Read More 🔶

### **Constructability Review Program**

The Constructability Review Program reviews projects during development identify, examine, and resolve constructability challenges through a partnership with the AGC.

Read More 🔶

# VMO Links VA Worksheet CLEAR Submission VMO Programs Feedback Form NCID Page VMO Guidelines 2020 NCDOT VE Training VMO External Guidelines 11.0.pdf

Find all the information for each of our programs and helpful links on each page on our website.



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This site is for the sharing of Lessons Learned and Best Practices from industry partners. In addition to the Post Construction Assessments and CLEAR updates industry partners.

Read More 🔶

### Risk Assessment Program

The Risk Assessment Program applies a risk assessment process to projects and programs to identify and mitigate potential risks.

Read More 🔶

### Value Assessment

Each Project Team needs to conduct a Value Assessment to consider cost containment measures to reduce the Construction and long-term Maintenance costs for a project in Development.

Read More 🔶

### Value Engineering Program

The Value Engineering Program applies FHWA's value analysis through Value Engineering studies prior to the project letting.

Read More 🔶

### Value Engineering Proposals Program

The Value Engineering Proposal Program supports Contractor time and money saving ideas through review of proposals submitted by Contractors during construction based on the Specification.

Read More 🔶

### VMO Links

NCTIC Site

VMO PDN QA QC Documents

Constructability Review Research Survey

**CLEAR Submission** 

VMO Programs Feedback Form

NCID Page

### **VMO Guidelines**

2020 NCDOT VE Training	
VMO External Guidelines 11.0.pdf	PDF
VMO PDN QA QC Documents	ZP
VA Worksheet .xlsx	X
Fact Sheet	PDF
Continuing Education Resources	PDF



State Value Management Engineer Alyson Tamer, PE, CPM

valuemanagementunit@ncdot.gov

Employee Directory Staff contacts for Value Management.

# Find all the information for each of our programs and helpful links on each page on our website.



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# **Project Knowledge Share**

- Submit Lessons learned into CLEAR
- Sign up for Lunch & Learns/PCA notification
- Watch Lunch and Learn recordings
- Find info on PCAs

### **Project Knowledge Sharing**

This site is for the sharing of Lessons Learned and Best Practices from industry partners. In addition to the Post Construction Assessments and CLEAR updates industry partners.

♠ ► Connect NCDOT ► Projects ► Value Management ► CLEAR Program ► Project Knowledge Sharing

### Submit Lessons Learned and Best Practices

### As an industry partner, we value your expertise and invite you to submit best practices and lessons learned from Projects in development and construction. Utilizing the link below, submit into our CLEAR portal – NCDOT's Knowledge Management Program. Your submission will be reviewed and vetted by Department experts and implemented as applicable.

### CLEAR Lesson Learned Form

Department personnel can access these forms by going to the CLEAR portal: CLEAR Communicate Lessons, Exchange Advice, Record (ncdot.gov)

Learn more about the program and our 2021 Innovation Challenge: https://youtu.be/CAxT4gDu7yk

Sign-up for Notification of upcoming PCAs here. Sign-Up for Notifications of upcoming Lunch and Learns here.

### Post Construction Assessments

The Post Construction the project sollowing substantial completion of the project sollowing substantial completion of the project solution of the project solution of the s

A map of all projects that will have a Post Const https://arcg.is/1iGzSj

If you have any questions on the Post Construction Assessments please contact the Val Management Team at CLEAR@NCDOT.GOV.

### How to use this page

Detailed instructions on how to use this page-

Click here for PDF

Click here for Video

Post Construction Assessments Access

Click Log In to access the Site with all the projects.

Log in

If this is your first time here, scroll down to see if you need to request access.

### Lunch and Learn Recordings

🗸 🗋 Name

Session : Bridge Stormwater Runoff Managemen

Session : Construction Revision Process - 02/22/

### Post Construction Assessments Post Construction Assessments

♠ ► Connect NCDOT ► Post Construction Assessments

### Post Construction Assessments

### ➔ Asheboro Bypass (C203617 - R-2536)

- → Bridges 149 & 150 on I-40 at Exit 112 (C204072 - B-4448)
- Corridor K (A-0009C)
- ➔ Dillsboro Bridge (C204330 B-5905)
- → Fayetteville Outer Loop (C293398 U-2519CB)
- ➔ Greenville Southwest Bypass (C203609 R-2250)
- → I-40 bridges over Berea Church Rd in Burke County (C203935 - B-4447)
- ➔ I-85 Widening (C203328 I-3802A)
- → I-85/US 321 interchange improvements (C203846 - I-5000)
- → NC 59 over I-95 Bus/US 301 (C204076 B-4491)
- NC 87 Bridges over Haw River and Mill Race (C203676 - B-5239)
- → Old Battleboro Road Roundabout (DD00264 -P-5711CA)
- Peace St and Wade Ave over Capital Blvd (C203751 - B-5121/B-5317)
- Rowan Street Bridges over CSX (C203917 B-4490)
- ➔ Slocum Gate Flyover (C203955 R-5516)
- ➔ Surf City Bridge (C203789 B-4929)
- → US 19 (C203358 R-2519B)
- → US 221 (C203758 R-2915 A/B)
- → US 221 (C203801 R-2915C)
- → US 421 Br over Fishing Creek Hurricane Washout of 421 (C204282 - N/A)

### **Post Construction Assessments**

Connect NCDOT > Post Construction Assessments

### Welcome to Project Assessments

This is the page for the Post Construction Assessments and other Project Assessments. On this page you can access each of the Projects that either has a review scheduled or completed assessment.

A map of all projects that will have a Post Construction Assessment can be found here: https://arcg.is/1iGzSj

If you have any questions contact CLEAR@NCDOT.GOV

### Projects

### Upcoming Assessments Completed Assessments

Rowan Street Bridges over CSX (C203917 - B-4490)

Slocum Gate Flyover (C203955 - R-5516)

Corridor K (A-0009C)

NC 59 over I-95 Bus/US 301 (C204076- B-4491)

US 74 at Hallsboro Rd (C204115 - R-5749)

US 19 (C203358 - R-2519B)

### Post Construction Assessment (PCA) Request Form

Fill out this form if you have a project that you would like the Value Management Office to facilitate a Post Construction Assessment (PCA).

To see previous Post Construction Assessments look under Projects on this page and click the tab - Completed Assessments.

PCAs on projects can be conducted at substantial completion with no outstanding claims or contract issues. They include the contractor, design teams, and NCDOT personnel.

The Submitter Information at the begining of the form is for follow up purposes so we can contact you regarding scheduling the PCA. This section should be completed by the person completing the form. The place to enter the additional contact information for other project personnel involved is later on in the form.

### Click Here For Form

### How to use this page

Detailed instructions on how to use this page -

Click here for PDF

Click here for Video

# **2022 PCAs Scheduled**

- March 15th: (complete)
  - -R-5516 Slocum Gate Flyover
- April 18th:
  - -R-5749: US 74 at Hallsboro Rd
- April 25th:
  - B-4490: Rowan Street Bridge over CSX
- May 17th:
  - -B-4491: NC 59 over I-95 Bus/US 301

# Questions?

# Alyson Tamer, PE, CPM

# State Value Management Engineer

awtamer@ncdot.gov

### valuemanagementunit@ncdot.gov

## CLEAR@ncdot.gov