



NORTH CAROLINA

Department of Transportation



Value Assessment Facilitation

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March 24, 2022

Webinar Purpose and Goals:

- Provides guidance on the timing and project selection for Value Assessments (VA's)
- Outlines a more standardized process for conducting NCDOT VA's
- Identifies Best Practices and associated tools that have been developed to improve cost containment outcomes
- Intended for NCDOT personnel and consultant teams which conduct VA's without certified team leaders (CVS's)

Topics

Difference between VE and VA

Goal of Value Assessments

VA Project Selection and Timing

PM/Leads Roles and Responsibilities

Pre-Workshop Tasks and Tips

Tips for VA Steps/Phases

New Tools Available

Next Steps

Questions

Value Engineering

- FHWA's 7-step Process
- Value-added ideas
- Firms must be third-party and use a CVS to facilitate
- Coordinated through VMO
- Required if NHS route with total costs over \$40M with structure and \$50M w/o.

Value Assessment

- No prescribed process
- Cost Containment ideas
- Firms must be third-party (CVS not required)
- Coordinated by PM/Leads
- Projects over \$5M

Goal of Value Assessments



Goal is Cost Containment to reduce project costs by 10%



Cost Estimates and project costs are continuing to increase



Cost Containment is a focus of project delivery through the PDN

VA Project Selection

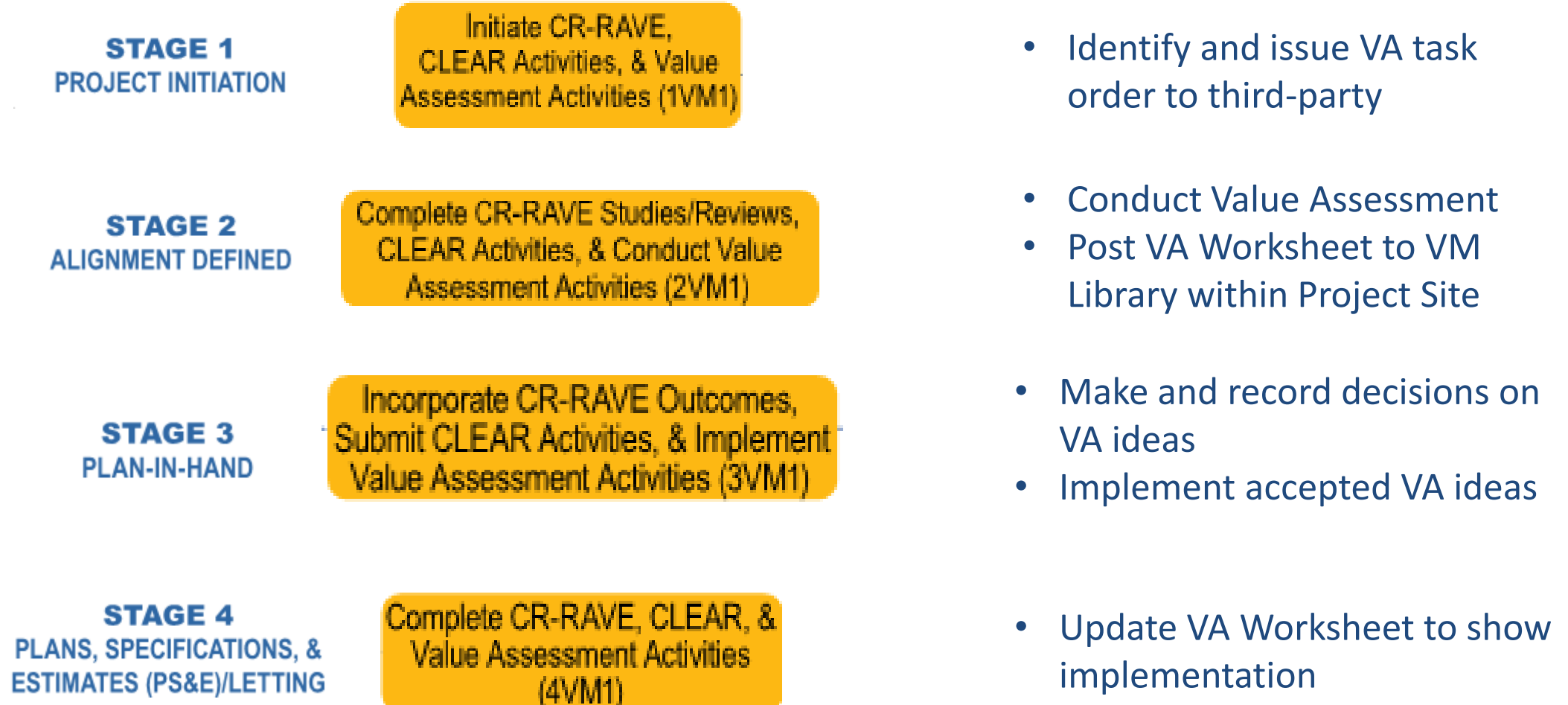
DBB projects > \$5 Million require a VA

- Projects on NHS exceeding \$50 Million require a VE
- Structure projects on NHS exceeding \$40 Million require a VE
 - Structures include bridges, large culverts, large pipes or groupings

What is the TOTAL Cost?

- Total Cost (TC) includes ALL project costs
- $TC = \text{Preliminary Engrg} + \text{ROW} + \text{Utilities} + \text{Construction}$

NCDOT Project Delivery Network



Timing of Value Assessment

- Ongoing projects may need now
- Timing for new projects will follow the PDN
- Appropriate project development for VA
 - Preferred alternative (“baseline”) selected
 - Baseline features defined
 - Typical sections along mainline and major crossroads
 - Turn lanes, etc, at intersections defined
 - ROW limits and impacts indicated
 - Major structures (bridges, culverts, retaining walls) shown
 - Construction and ROW cost estimates associated with latest baseline design completed

Roles and Responsibilities:

Project Managers/Leads

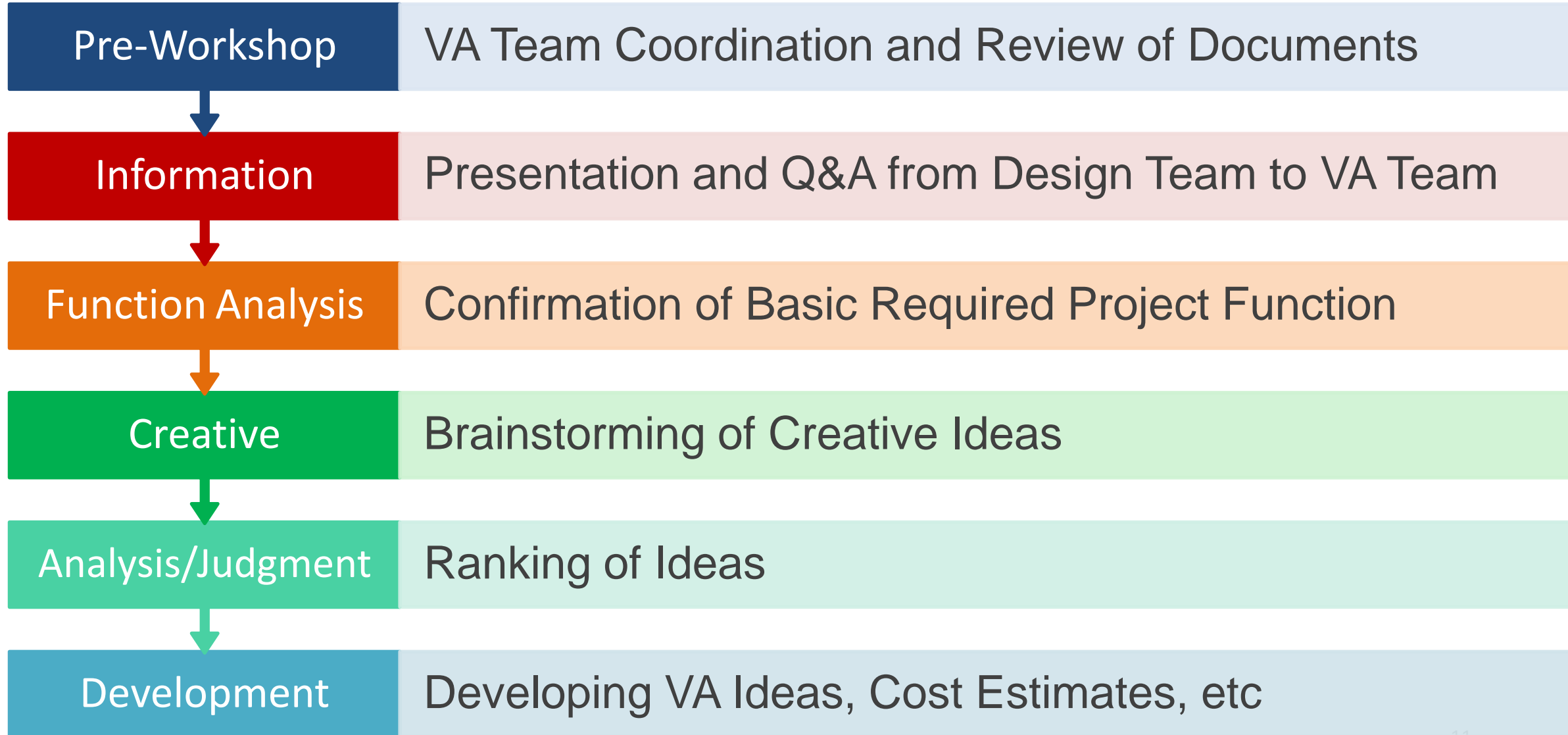
- Identify and secure third-party firms to do VAs on selected projects
- Provide access to project SharePoint site and project information with Contributor access to Value Management Library for VA Consultant
- Work with Project team to review Recommendations

Roles and Responsibilities:

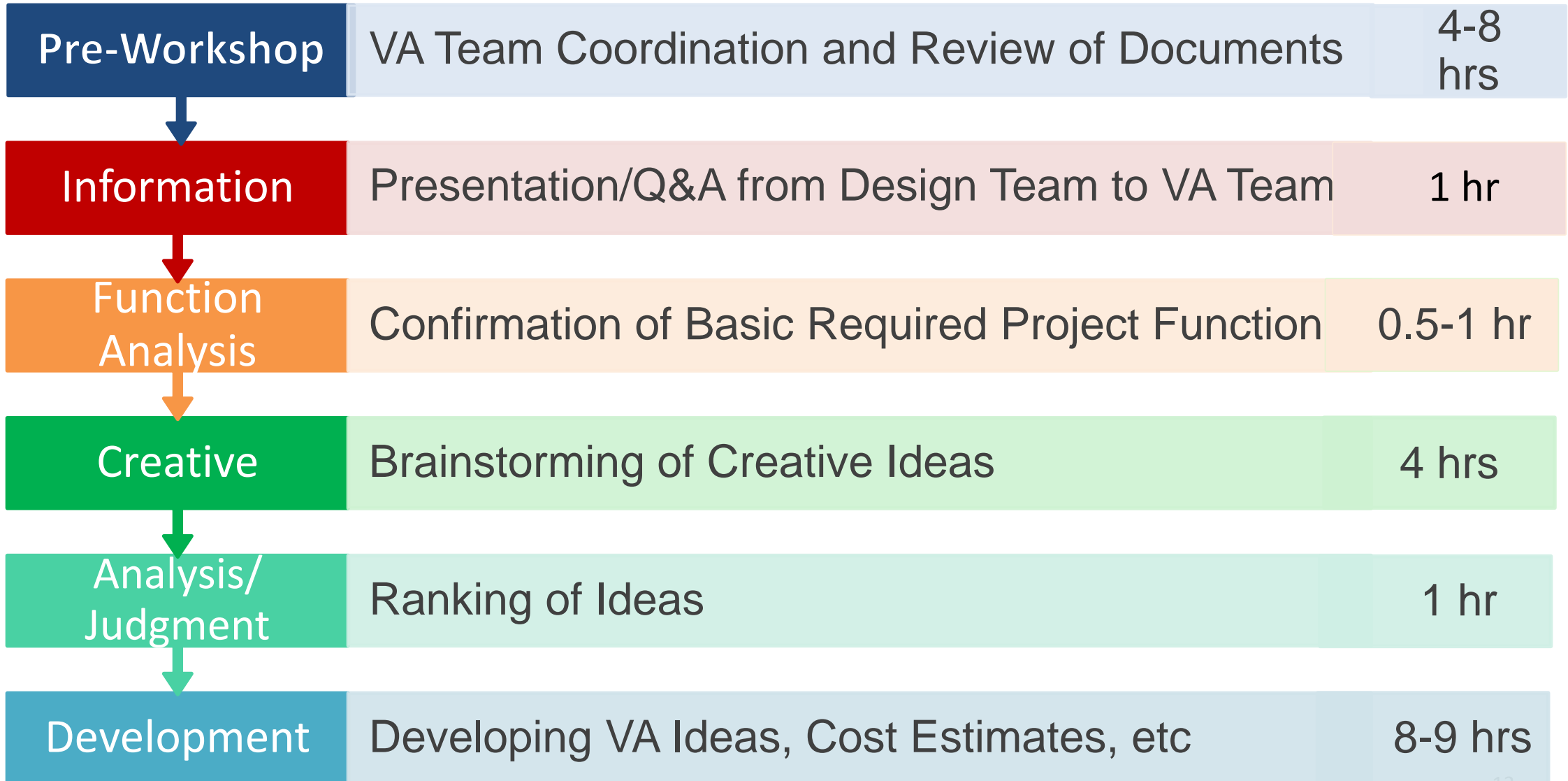
Project Managers/Leads

- Provide decisions with justification in VA Worksheet
- Ensure accepted ideas are implemented into project design
- Coordinate with Division Engineers for final concurrence
- Email ValueManagementUnit@ncdot.gov when VA is completed.

Recommended VA Phases



Recommended VA Agenda



Pre-Workshop Tasks & Tips

- Assemble the VA team
- Download/request project documents
- VA Team reviews documents
- Leader develops tools

Tip 1: Utilize VA Planning Checklist.

Tip 2: Assemble the right VA team for the project.

Tip 3: Ensure VA Team has required information.

Tip 4: Develop a Cost Model to identify the primary cost areas.

Tip 5: Schedule 30-minute Pre-workshop Meeting

Utilize VA Planning Checklist

- A VA Planning Checklist template is available for download and use
- Helps with planning VA logistics
- Includes reminders for communication, internally and externally

NCDOT Value Assessment Planning Checklist

PROJECT: _____

STIP No.: _____ **COUNTY:** _____

VA PM: _____ **VA DATES:** _____

FACILITATOR ACTIONS/TASKS – PRE-WORKSHOP

ACTIVITY	NEEDED BY	DONE?	NOTES
Coordinate dates with NCDOT Lead and Design Lead			
Coordinate design team presentation & send mtg invite			
Review project and assemble required VA team			
Develop & Send Agenda			
Send meeting invites to VA team			
Reserve conference room			
Download documents and send to VA team			
Develop cost model and VA forms			
Review documents			
Gather supplies – flipchart/markers			

Recommended VA Team

- Independent from design team
- VA Team mirrors the primary design team disciplines; confirmed based on the status of the design documents
- P.E.'s or other certs for position (PTOE, etc)

Positions on all projects:

- Roadway Engineer
- Construction Expert

Other potential positions:

- Structures Engineer
- Traffic Engineer
- Hydraulics, Environmental, Geotech, etc

Project Documents Needed by VA Team

- Following are needed 1 week prior to VA
- 15% Plans or well-developed public meeting maps with typical sections
 - Construction cost estimate
 - Right-of-way cost estimate
 - Utility cost estimate
 - Traffic forecast/Capacity analysis
 - Proposed design criteria
 - Vehicle crash data
 - Other background information that impacted the current baseline design (meeting minutes, etc)

Develop a Cost Model

- Leader to develop a Cost Model, to allow focus on highest cost areas
- A Cost Model template is available

COST MODEL / DISTRIBUTION		
TIP No. U-3318		
Upgrade Main Street		
Wake County, NC		
ITEM	COST \$	% OF TOTAL
RIGHT-OF-WAY	5,100,000	26.58%
ASPHALT CONCRETE PAVING	4,847,604	25.27%
EARTHWORK	2,380,920	12.41%
GRASSING/EROSION CONTROL	1,507,275	7.86%
DRAINAGE SYSTEM	1,201,833	6.26%
BRIDGES	1,138,500	5.93%
CLEAR & GRUB	843,755	4.40%
SIGNALS	717,750	3.74%
CONCRETE MEDIANS	472,758	2.46%
TRAFFIC CONTROL	344,680	1.80%
CURB & GUTTER	208,530	1.09%
SIGNAGE/MARKING	169,708	0.88%
GUARDRAILS	113,213	0.59%
FENCING	110,494	0.58%
CONCRETE SLABS/APRONS/MEDIANS	28,463	0.15%

Pre-Workshop VA Team Meeting

- Facilitator should hold a 30-minute VA Team meeting the day prior to the VA workshop

Topics to cover with VA Team:

- Questions on current design
- Additional design information needed
- Cost saving opportunities identified

Information Phase Tasks & Tips

1

- VA Team post-document review discussion prior to briefing
- Design team project briefing
- VA Team post-briefing discussion of takeaways

Tip 1: Ensure DOT and design team PM's understand needs/topics of design team briefing

Tip 2: Kick off VA with review takeaways and questions

Tip 3: Following briefing, VA Team discusses takeaways

Needs/Topics of Design Team Meeting

Design Team Project Briefing Objectives:

- Answer questions from VA Team
- Understand goals/purpose of project
- Understand current baseline design
- Understand cost estimate
- Identify key design criteria or assumptions influencing the solution
- Identify project constraints that can't be changed
- Other alternatives considered and reasons for not selecting
- Identify unique criteria influencing design

Pre-Briefing Discussion with VA Team

30- to 45-minute VA Team meeting prior to design team presentation

- Review fully completed, have prior questions have been answered?
- Make list of questions still remaining on current design
- Make list of additional information required
- VA Team Reminders:
 - This is the opportunity for Q&A
 - Intent is to confirm current design, not to convey cost saving opportunities

Post-Briefing Discussion with VA Team

15-minute VA Team discussion following design team presentation

- Observations on current design
- Were questions answered, and is reason for selecting current design clear?
- Additional questions remain?
- Did the presentation eliminate the feasibility of cost saving opportunities?

Questions?

*Any questions on the Agenda,
Pre-workshop or Information Phase?*



Function Analysis Tasks & Tips

2

Identify Functions to be Accomplished by Project

- “what” must be accomplished by the project, independent of “how” it is being accomplished
- Confirms the required functions, or purposes, the project must fulfill
- Identify the problem the project is solving
- Conducted in an interactive discussion

Function Analysis Tasks & Tips

2

Identify Functions to be Accomplished by Project

- List all functions then, through interactive discussion, select required function(s)
- Abbreviated session compared to VE

Tip 1: Use Purpose and Need to identify required functions of the project.

Use Purpose and Need to Identify Required Functions

Example Purpose and Need

The roadway widening project is intended to address the following operational, crash reduction and quality of life issues:

- Operations: The SR 3318 / Riverside Road / Azalea Drive intersection **currently operates at LOS F / E** in the morning and afternoon peak periods respectively. The poor LOS operations results in **significant queuing** and **congestion** in the peak directions.
- Crash Rates: the SR 3318 corridor had a **crash rate more than twice the statewide average** crash rate for each of the years between 2015 and 2017.
- Bridge Deficiency: The project **replaces the structurally deficient Riverside Road bridge** over Vickery Creek.
- Bike and Pedestrian Connectivity: There are **no bike lanes and the sidewalks are not continuous** along the corridor. The corridor intersects the River trail system and does not connect this resource with the historic square. The project goals include **complete street implementation** along SR 3318.

Use Purpose and Need to Identify Required Functions

Improve Operations	Control Access	Reduce Congestion
Reduce Queueing	Increase Capacity	Reduce crashes
Limiting Conflicting Movements	Replace Deficient Bridge	Connect Bike Paths
Connect Pedestrian Paths	Connect Transit Paths	Minimize Impacts

Required Functions:

- Improve Operations
- Reduce Crashes

Examples of other required functions:

- Replace (Deficient) Bridge
- Increase Capacity
- Relieve Congestion
- Reduce Conflict Points [e.g., Interchange]
- Correct Deficiencies

Pop-up Question:

What is the required function based on the following Purpose and Need?

The new interchange would relieve the existing traffic congestion of adjacent interchanges and handle the projected future 2040 traffic volumes. The new interchange would also reduce the frequency and severity of collisions as a result of the expected reduction in congested roadways and provide additional freeway access to facilitate the economic development of the local Counties, which includes a planned regional mixed-use development.

Pop-up Question:

The new interchange would relieve the existing traffic congestion of adjacent interchanges and handle the projected future 2040 traffic volumes. The new interchange would also reduce the frequency and severity of collisions as a result of the expected reduction in congested roadways and provide additional freeway access to facilitate the economic development of the local Counties.

The required functions are (pick two):

- **Relieve Congestion**
- Reduce Crashes
- **Increase Capacity**
- Correct Deficiencies

Creative Phase Tasks & Tips

3

Brainstorm potential cost savings ideas

- Open, interactive discussion
- Don't restrict team members to their discipline
- Do not allow judgment; seek quantity of ideas
- Seek balanced input from all team members
- Design Exceptions can be considered

Creative Phase Tasks & Tips

3

Brainstorm potential cost savings ideas

- Tip 1: Using Cost Model, focus on highest cost areas
- Tip 2: Identify project features not fulfilling required functions, or alternatives to achieve required functions
- Tip 3: “Drive” corridor using Google Maps
- Tip 4: Start with Typical Sections
- Tip 5: Brainstorm from beginning to end of corridor
- Tip 6: Use Cost Containment Considerations list on website

Focus on Highest Cost Areas in Cost Model

- Use “Pareto’s Law”, or the 80/20 rule, to focus on highest cost areas
- A Cost Model template is available

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**Keep in mind
“required
functions”**

Re-visit “Required Functions”

- Any unnecessary features, or portions of project, that do not help achieve the required functions?
 - Example: purpose of project is to improve capacity of mainline, but design includes upgrading side roads extensively
- Alternative design approaches that can achieve the required functions at a reduced cost?

“Drive” Corridor Using Google Maps



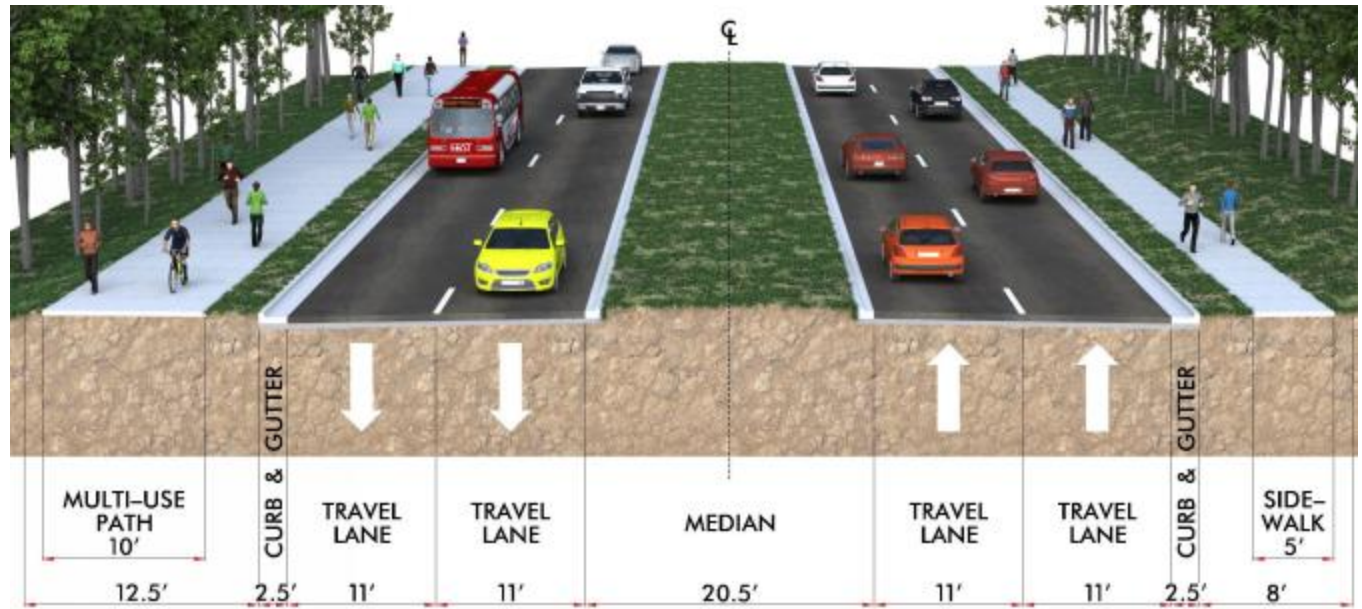
“Drive” Corridor Using Google Maps

Google Maps Jones Bridge Rd



Image capture: Jun 2017 © 2018 Google

Start Brainstorming Changes to Typical Sections



Look at widths of features:

- Berms
- Travel Lanes
- Median
- Side Paths/Sidewalks
- Turn Lanes

Brainstorm from Beginning to End of Corridor

Brainstorm from beginning to end:

- Plans
 - Horizontal alignment to minimize impacts
- Profiles
 - Vertical as close to existing as possible
- Cross-sections
 - Retaining walls vs. slopes
- All Intersections
 - Traffic counts/required turn lanes
 - Minimize side road tie-in lengths

**Refer to list of
“Cost
Containment
Considerations for
Value
Assessments”**

- See “Cost Containment Considerations for Value Assessments” for sample ideas
- Ideas are organized by project type or feature
 - General Issues
 - Typical Sections
 - Right-of-Way
 - Side Slopes/Retaining Walls
 - Intersections/Side Roads
 - Bridges
 - Interchanges
 - Design Exceptions
 - Drainage
 - Construction Practices

Questions?

Any questions on the Function Analysis or Creative Phases?



Analysis Phase Tasks & Tips

4

Judge/rank ideas to create shortlist for development

- Open, interactive discussion for ranking ideas
- Time management; ensure developed ideas have chance of acceptability
- Ensure shortlist is manageable to develop; each team member can develop 3 to 5 ideas
- Prioritize ideas based on feasibility and highest cost savings

Tip 1: Ranking based on acceptability and cost savings

Ranking Parameters

Parameters for a Good Value Assessment Idea:

- Provides a cost savings
- Technically feasible
- Acceptable to NCDOT

Ranking:

- Develop the creative idea as a written Value Assessment proposal if it meets these 3 parameters
- May need to develop the cost savings information first to confirm

Development Phase Tasks & Tips

5

Develop the shortlisted ideas

- Fill out VA Worksheet – see “VA Worksheet SOP Video”
- Develop potential cost savings
- Upon completion, upload to Value Management Library
- Notify PM/Lead and VMO

Tip 1: Ensure all proposals are well-developed; use latest version of VA Worksheet on website

Tip 2: Develop itemized cost impact

Tip 3: Include “check-in”s with the team during Development

Ensure well-developed proposals

Components of a well-developed idea:

- Recommendation Description: clearly state road ID and station numbers
- Don't state opinions ("relatively"), use traffic volumes, truck %, design speeds
- When stating a recommendation meets policy, state the section/table
- If a recommended idea is used on another NCDOT project, identify it
- Add sketches when needed
- If idea came from using Google Maps, include a visual of the existing conditions

Develop itemized cost impact

- Develop potential cost savings
 - Cost breakdown should include ROW, Utility, and Construction (and estimated redesign cost, if possible)
 - Include some derivation of quantities
 - Include itemized cost calculation
 - Do QC backcheck of quantity and cost derivation

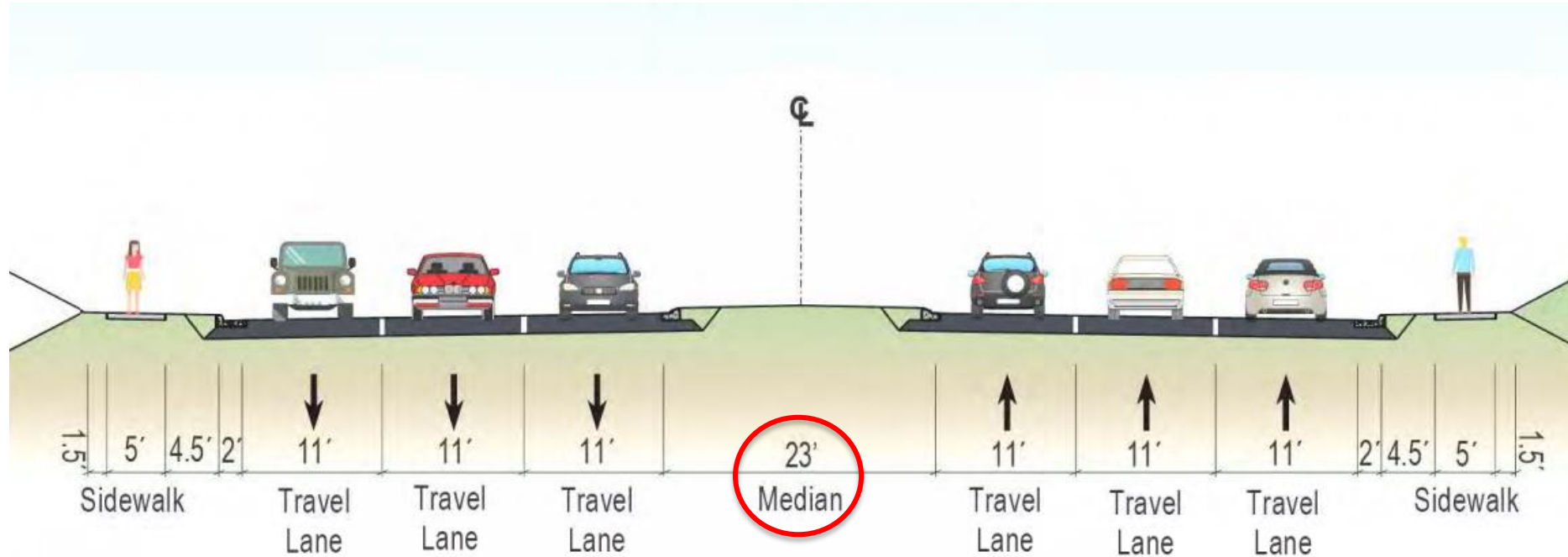
Quantity Derivation

Component	Unit	EA	Beg Sta	End Sta	Length	Width	Depth	Area	Vol/Wt
Milling								SY	
Mill Mainline	SY		95700	99000	3300'	48'		17,600	
Asphalt								SY	TNS
SF9.5c	TN		95700	99000	3300'	39'	3"	28,600	4,805
I19C (inside shoulder)	TN		95700	99000	3300'		4"	3,789	864
I19C (outside shoulder)	TN		95700	99000	3300'		4"	7,942	1,811
B25C (inside shoulder)	TN		95700	99000	3300'		8"	4,400	2,006
B25C (outside shoulder)	TN		95700	99000	3300'		8"	8,433	3,846
Asphalt binder (fr NCDOT spreadsheet)	TNS								670
Earthwork									
Unclassified Excavation (inside shoulder)	CY		95700	99000	3300'		15"		1,895
Unclassified Excavation (outside shoulder)	CY		95700	99000	3300'		15"		3,971

Itemized Cost Back-up

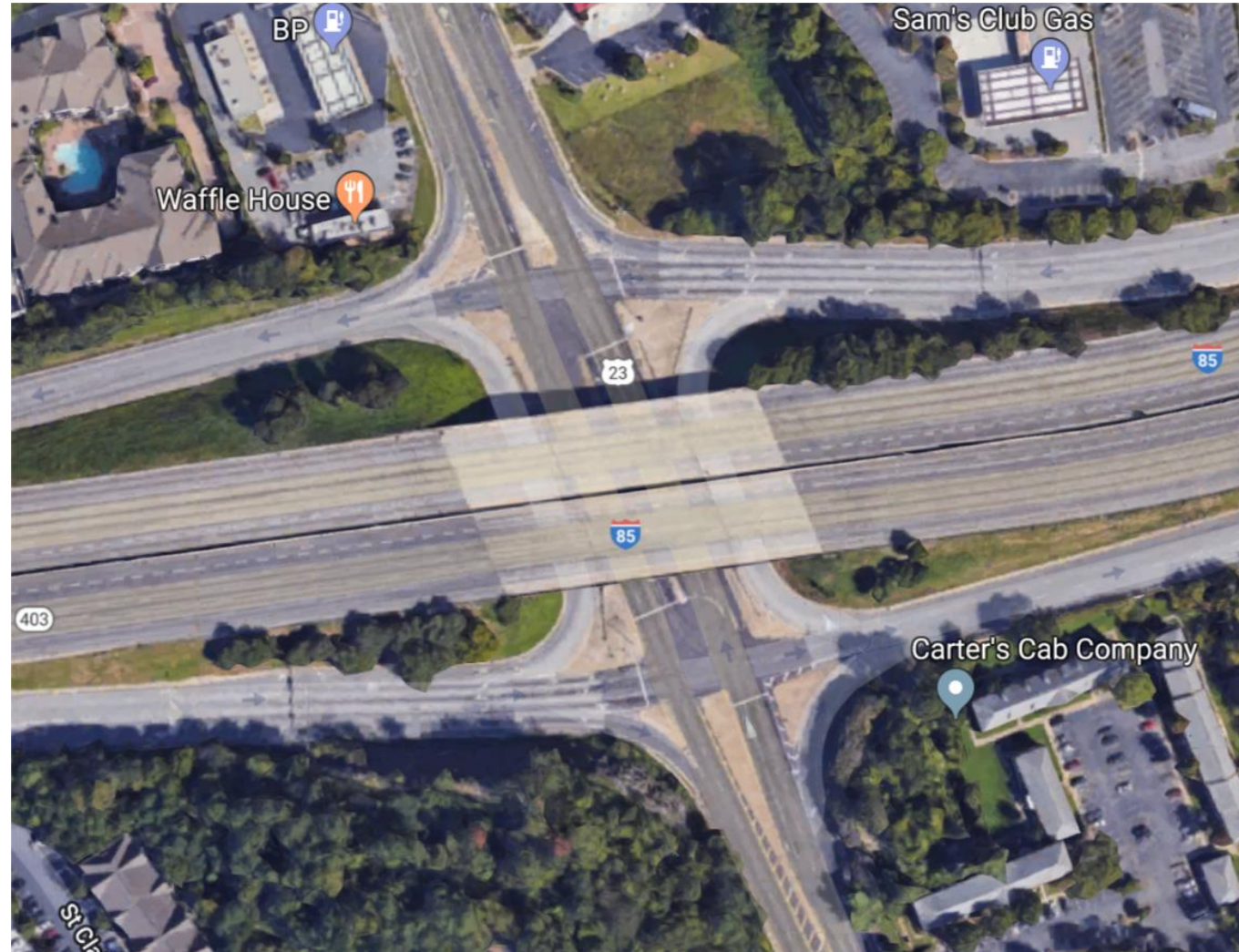
Component	Unit	\$/Unit	Original		Recommendation	
			Quantity	Total	Quantity	Total
Milling						
Mill Mainline	SY	\$1.63	17,600	\$28,688		\$0
Asphalt						
SF9.5c	TN	\$55	4,805	\$264,264		\$0
I19C (inside shoulder)	TN	\$50	864	\$43,196		\$0
I19C (outside shoulder)	TN	\$50	1,811	\$90,539		\$0
B25C (inside shoulder)	TN	\$60	2,006	\$120,384		\$0
B25C (outside shoulder)	TN	\$60	3,846	\$230,736		\$0
Asphalt Binder	TN	\$550	670	\$368,500		\$0
Earthwork						
Unclassified Excavation (inside shoulder)	CY	\$10.50	1,895	\$19,893		\$0
Unclassified Excavation (outside shoulder)	CY	\$10.50	3,971	\$41,696		\$0
Roadway Subtotal				\$1,207,895		\$0
25% Roadway Mark-up				\$301,974		\$0
Roadway Total				\$1,509,869		\$0

Sketch



Proposed Change: Reduce Median to 17'

Visual of Existing Application



Hold “Check-in” Sessions During Development (for remote/ virtual VA)

- Brief, 30-minute “check-in” sessions with VA Team during Development
 - Allows for progress check on completion of write-ups
 - Allows for a VA Team Member to get input on an idea write-up
 - Assumptions to make
 - How to develop an estimate
 - Design policy application
 - Identifying an NCDOT project where it’s used

Questions?

*Any questions on the Analysis or
Development Phases?*



New VA Tools Available:

- VA Planning Checklist
- VA Agenda Template
- Cost Model Template
- Cost Containment Considerations (Revised)
- Revised VA Worksheet
- Sample VA Recommendation Back-up Tab

Located at on the Value Management Office Website:
<https://connect.ncdot.gov/projects/Value-Management/Cost-Containment/Pages/default.aspx>



Connect NCDOT Home

Bringing Business and Government together with online collaboration.



Browse All Sections

Doing Business

How to work with the North Carolina Department of Transportation.



Bidding & Letting

Bidding and letting information for Central, Division, Design/Build and Bridge & Culvert Lets.



Projects

For businesses working on NCDOT Projects and Contracts.



Resources

Data and documents needed to work with the NCDOT.



Local Governments

Municipalities, local government agencies and other non-business groups working with NCDOT.



More Site Content

Manuals

Important guides and handbooks from NCDOT.



Maps

County, statewide and project-specific maps.



Training

Certifications, course descriptions and online classes.



Groups & Committees

Private and public organizations working with NCDOT.



Events

Upcoming meetings, conferences, and gatherings.



Contenido en Espanol

Contenido para nuestros socios de habla hispana.





Bike & Pedestrian

 View Pages

Guidelines and resources for development and design of Bicycle and Pedestrian Projects.

Construction

 View Pages

Support for administration of NCDOT construction projects.

Contracts

Standards, Specifications and Drawings for contract bid packages.

Integrated Project Delivery

 View Pages

Tools for streamlining the process – from concept through construction


Planning

 View Pages




Downloads


New Updated Featured

AGC - NCDOT Workshop - Structure_Roadway_ValueManagement.aspx 

2021-06-22 09:14:13

AGC - NCDOT Workshop - General Session.aspx 

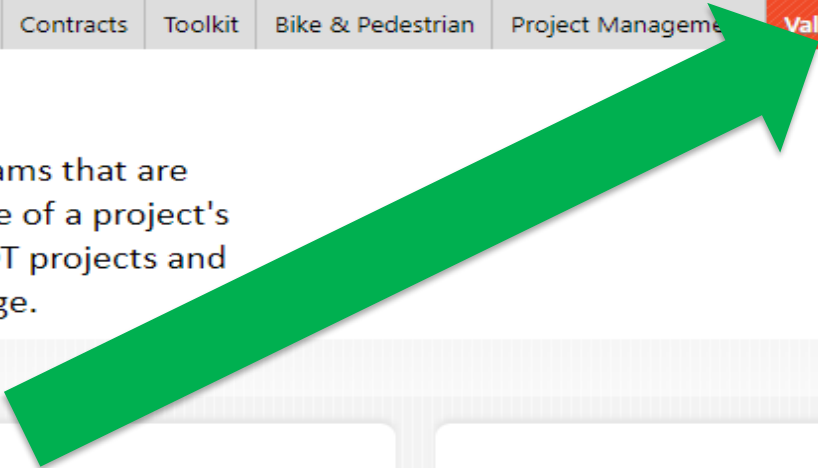
2021-06-22 09:12:17

AGC - NCDOT Workshop - Contract Admin.aspx 

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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.



Home > 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](#) →

Cost Containment

VMO Links

[VA Worksheet](#)

[CLEAR Submission](#)

[VMO Programs Feedback Form](#)

[NCID Page](#)

VMO Guidelines

[2020 NCDOT VE Training](#)

[VMO External Guidelines 11.0.pdf](#)

[VA Worksheet](#)

[Fact Sheet](#)





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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.

[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](#)



[VMO PDN QA QC Documents](#)



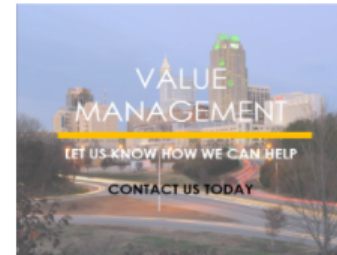
[VA Worksheet .xlsx](#)



[Fact Sheet](#)



[Continuing Education Resources](#)



State Value Management Engineer - Alyson Tamer, PE, CPM

valuemanagementunit@ncdot.gov



Employee Directory
Staff contacts for *Value Management*.

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.

🏠 ▶ Connect NCDOT ▶ Projects ▶ Value Management ▶ Value Assessment

Value Assessment



Links

[Sample Scope of Work- Revised](#)

[VA Worksheet SOP Video](#)

[Cost Containment Considerations- Revised](#)

[NCDOT Cost Model Template](#)

[Sample VA Recommendation Back-up](#)

[VA Agenda Template](#)

[VA Planning Checklist](#)

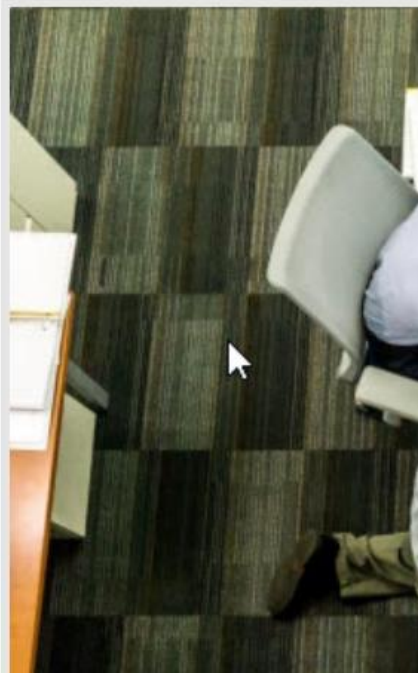
[VA Worksheet- Revised](#)

Value Assessment

Each Project Team needs
cost containment measur
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Value Assessment



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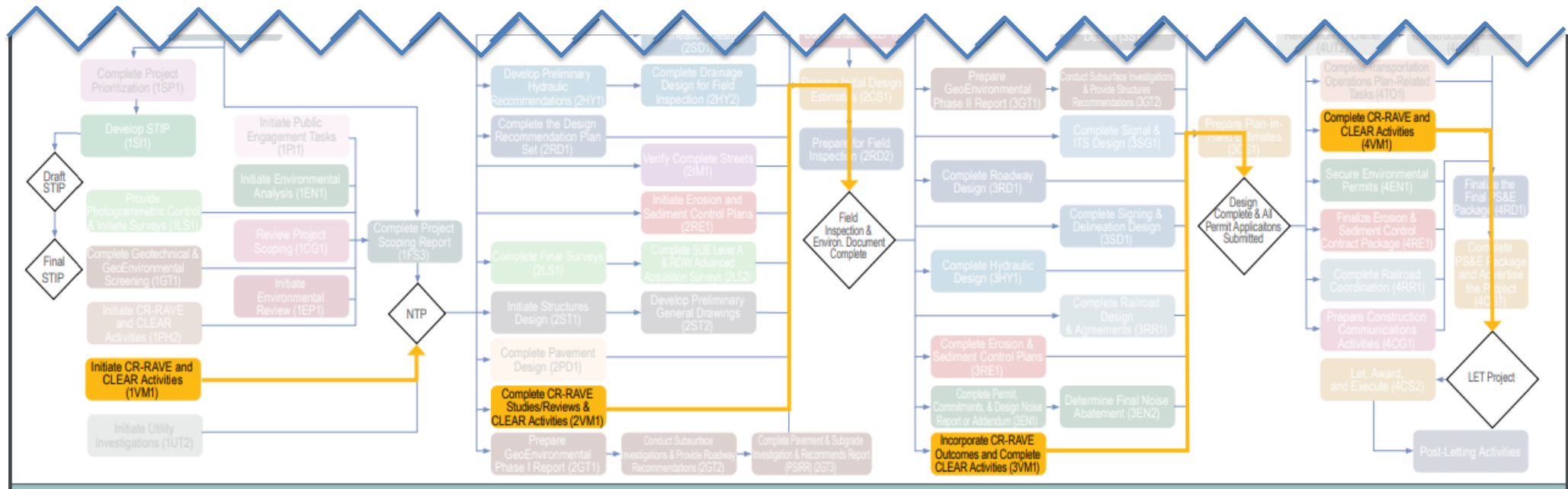
[VA Agenda Template](#)

[VA Planning Checklist](#)

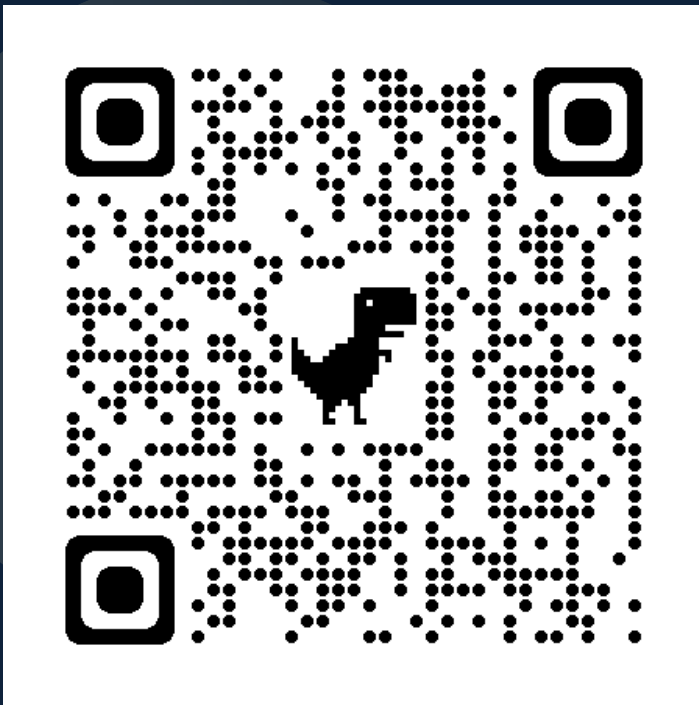
[VA Worksheet- Revised](#)

Next Steps

- Continue to provide feedback on the VA process
- VMO will provide guidance and support, and make updates as needed
- VA's are delivering results, and are now a part of how we do business



Questions?



State Value Management Engineer

Alyson Tamer, PE, CPM

awtamer@ncdot.gov

ValueManagementUnit@ncdot.gov

<https://connect.ncdot.gov/projects/Value-Management/Pages/default.aspx>