NCHRP NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

Arizona State University

University of Colorado Boulder

TRB TRANSPORTATION RESEARCH BOARD OF THE NATIONAL ACADEMIES

The National Academies of Sciences, Engineering, and Medicine

Training on Post-Award Contract Administration for Highway Projects Delivered using D-B and CM-GC

Based on NCHRP Research Report 939 Volumes 1, 2, and 3

Session 5 of 8: October 13, 2022

Agenda

- 10:00-10:10 am Welcome and reminders
- 10:10-10:20 am In-progress design workshops
- 10:20-10:35 am Over-the-shoulder reviews (ARDOT guest)
- 10:35-10:50 am Open-book estimating (MDOT guest)
- 10:50-11:05 am Scope validation period (VDOT guest)
- 11:05-11:15 am Public announcement
- 11:15-11:25 am Delegation of authority
- 11:25-11:45 am Peer Exchange: Group Discussion
- 11:45-12:00 pm Wrap-up (+poll)

Note: All times are in Pacific Daylight Time (PDT)

Review: Last Session's Learning Objectives

- **Phases and strategies** – Introduce the *design* phase and review the *design* strategy
- **Tools** – Explain the following tools, illustrated with examples from DOTs:
  - Plan standards
  - Deviations from agency standards
  - Discipline task force
  - Independent party design review
  - Cost-savings matrix
- **Peer exchange** – Discuss how agencies implement these tools to enhance quality in ACM projects

Review: Last Session's Takeaway Points

- **Plan standards** adapt to meet the needs of building and as-building rather than bidding.
- **Deviations from agency standards** creates opportunity for added-value based on project-specific needs.
- **Discipline task force** enhances project quality and timely decision making with input from relevant parties.
- **Independent party design review** supports agency staff with timely third-part reviews.
- **Cost-savings matrix** fosters a culture of innovation leading to cost savings and other project benefits.

Overall Learning Objectives

1. Navigate and interpret the information in the D-B and CM-GC Guidebooks that is relevant to your project.

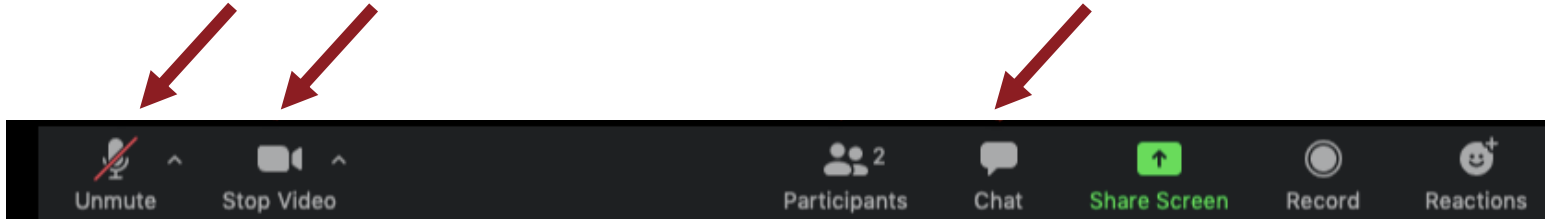
2. Select and implement appropriate tools for various types of D-B and CM-GC projects for all phases of contract administration.

Today's Learning Objectives

- **Phases and strategies** – Introduce the *preconstruction* phase and the *preconstruction services quality* strategy
- **Tools** – Explain the following tools, illustrated with examples from DOTs:
  - In-progress design workshops
  - Over-the-shoulder reviews
  - Open-book estimating
  - Scope validation period
  - Public announcement
  - Delegation of authority
- **Peer exchange** – Discuss examples and tips for agencies to implement these design and preconstruction tools in ACM projects

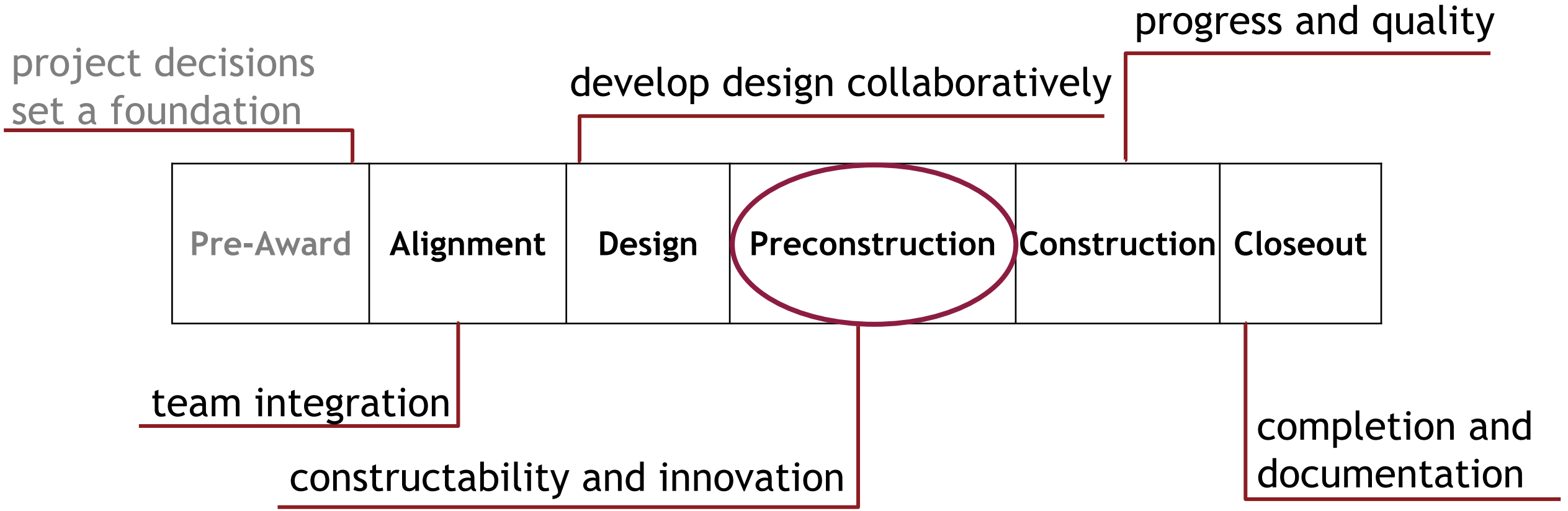
Logistics Reminders

- Please make sure you are registered (only once)
- Please make sure your name is correct on Zoom
- Download the *Guidebooks for Post-Award Contract Administration* *Vol. 1* and *2*
- No formal break; please take one if/as needed
- Actively engage and participate when prompted
- Use the chat feature as needed
- Ask for help



Contract Administration Phases

The guidebooks describe the following phases of D-B and CM-GC contract administration



Preconstruction Phase Administration

- The preconstruction phase allows the CM-GC to provide input on the design to enhance constructability and innovation
- Key activities include:
  - Review contractor input for design
  - Approve design changes based on CM-GC input
  - Negotiate GMP
  - Manage CM-GC documentation

Pre-Award	Alignment	Design	Preconstruction	Construction	Closeout

Overarching Contract Administration Strategies for D-B and CM-GC

Alignment Strategy

Scope Strategy

Design Quality Strategy (D-B)

Preconstruction Services Quality Strategy (CM-GC)

Construction Quality Strategy

Construction Efficiency Strategy

Preconstruction Services Quality Strategy

- Definition
  - Ensure quality of preconstruction services through active participation in design reviews and verifying competitive pricing of estimates
- Example tools within this strategy:
  - In-progress design workshops

    Meetings between the designer, contractor, and agency to discuss and verify the design process
  - Opinion of probable construction cost

    Iterative process for monitoring and validating the development of the cost estimate at key design milestones

PRECONSTRUCTION QUALITY

Today's Learning Objectives

- **Phases and strategies** – Introduce the *preconstruction* phase and the *preconstruction services quality* strategy
- **Tools** – Explain the following tools, illustrated with examples from DOTs:
  - In-progress design workshops
  - Over-the-shoulder reviews (ARDOT guest)
  - Open-book estimating (MDOT guest)
  - Scope validation period (VDOT guest)
  - Public announcement
  - Delegation of authority
- **Peer exchange** – Discuss examples and tips for agencies to implement preconstruction tools in ACM projects

In-Progress Design Workshops

In-Progress Design Workshops

- What is it?
  - A meeting requested by the agency or designer to verify design progress
- Why use it?
  - Assists the designer in resolving design issues and questions early
  - Ensures project team has a consistent understanding of the project assumptions and expectations

17 D-B
15 CM-GC

In-Progress Design Workshops

- When to use it?
  - During the design phase
  - When the designer and contractor are contractually obligated to coordinate with one another

	Contract Administration Phase				Project Complexity			Project Size		
	Alignment	**Design**	Construction	Closeout	Noncomplex	**Moderately Complex**	**Complex**	**≤ $10 million**	**$10 million–$50 million**	**> $50 million**
17 In-Progress Design Workshops		✓			◗	●	●	●	●	●

Note: ● = Recommended; ◗ = Consider case by case; ○ = Not recommended.

17 D-B
15 CM-GC

In-Progress Design Workshops

- How to use it?
  - Request meeting with ample lead time so the documents can be circulated and reviewed prior to the meeting
  - Create a written record of topics discussed, decisions made, follow-up actions needed

17 D-B
15 CM-GC

In-Progress Design Workshops

- Synthesis of Examples
  - In the contract, specify who can call an in-progress design meeting, minimum lead times, and who documents outcomes
  - Most effective when there is continuity of team members, team members prepare in advance, and actively engage in the meeting, and relevant team members and decision-makers participate

- Guidebook Examples
  - D-B p.107; CM-GC p.99-100

17 D-B
15 CM-GC

Example: I-15/215 Devore, Caltrans

- The Design-Builder or the Department may request (with [5] Working Days' notice) in-progress design workshops to discuss and verify design progress and to assist the Design-Builder and/or its designer(s) in resolving design questions and issues.
- At least [5] Working Days prior to each in-progress workshop, the Design-Builder shall assemble and submit drawings or other documents to be reviewed during the workshop to the Department for its information and review.

17 D-B
15 CM-GC

Today's Learning Objectives

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  - In-progress design workshops
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  - Delegation of authority
- **Peer exchange** – Discuss examples and tips for agencies to implement these tools in ACM projects

Over-the-Shoulder Reviews

Over-the-Shoulder Reviews

- What is it?
  - A meeting between the agency and designer to informally review and discuss design progress
- Why use it?
  - Provide agency feedback on design before design proceeds too far
  - Design process is not paused as it might for a formal review
  - Provides a level of quality review

18 D-B
17 CM-GC

Over-the-Shoulder Reviews

- When to use it?
  - During the design phase, regularly schedule or as needed

	Contract Administration Phase				Project Complexity			Project Size		
	Alignment	**Design**	Construction	Closeout	Noncomplex	**Moderately Complex**	**Complex**	**≤ $10 million**	**$10 million–$50 million**	**> $50 million**
18 Over-the-Shoulder Reviews		✓			◗	●	●	●	●	●

Note: ● = Recommended; ◗ = Consider case by case; ○ = Not recommended.

18 D-B
17 CM-GC

Over-the-Shoulder Reviews

- How to use it?
  - Include in the RFP
  - Prioritize critical path activities
  - Check specific design criteria during reviews

18 D-B
17 CM-GC

Over-the-Shoulder Reviews

- Synthesis of Examples
  - Include in the RFP and contract
  - Regularly scheduled or as needed
  - Do not wait until milestone submittals to hold over-the-shoulder reviews. These reviews help expedite milestone reviews.

- Guidebook Examples
  - D-B p.109-111
  - CM-GC p.105-106

18 D-B
17 CM-GC

Over-the-Shoulder Reviews

Agency tip

At the start of the job, all agency review comments were shared face-to-face at comment resolution meetings to gain team understanding of the project. Later as the project progresses and team alignment has settled in, comments can be shared in written form with in-person meetings as needed.

18 D-B
17 CM-GC

Unique Purposes for Each Type of Review

- Discipline task force
- Independent party design review
- In-progress design workshop
- Over-the-shoulder reviews
- Submittal reviews

18 D-B
17 CM-GC

Peer Exchange:
Guest Speaker

Keli Wylie, PE

Alternative Project Delivery Administrator

Arkansas Department of Transportation

Today's Learning Objectives

- **Phases and strategies** – Introduce the *preconstruction* phase and the *preconstruction services quality* strategy
- **Tools** – Explain the following tools, illustrated with examples from DOTs:
  - In-progress design workshops
  - Over-the-shoulder reviews
  - Open-book estimating
  - Scope validation period
  - Public announcement
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- **Peer exchange** – Discuss examples and tips for agencies to implement these tools in ACM projects

Open-Book Estimating

Open-Book Estimating

- What is it?
  - Contractor keeps complete estimating records and opens them for agency review and audit
- Why use it?
  - Verification of competitive pricing
  - Early knowledge of project costs to help keep project within budget

Open-Book Estimating

- When to use it?
  - During preconstruction and construction

	Contract Administration Phase					Project Complexity			Project Size		
	Alignment	Design	Preconstruction	Construction	Closeout	Noncomplex	Moderately Complex	Complex	≤ $10 million	$10 million–$50 million	> $50 million
18 Open-Book Estimating			✓	✓		◗	●	●	◗	◗	●

Note: ● = Recommended; ◗ = Consider case by case; ○ = Not recommended.

18 CM-GC

Open-Book Estimating

- How to use it?
  - Categorize costs (direct, indirect, contingency, mob & demob, corporate overhead, escalations, exclusions)
  - Corporate overhead and profit are tracked separately for transparent review of costs
  - Use during construction to check that adequate progress is being made

Open-Book Estimating

- Synthesis of Examples
  - Agency should develop a specification to define expectations
    - Confidentiality of cost data
    - Schedule for cost estimates
    - Required documentation and format
    - Policy on addressing estimates that are high

- Guidebook Example
  - CM-GC p.108-112

Example: E-470 widening,
Cherry Creek to Quincy Ave

- *The detail shall provide crews with rates of production for **each activity within the item of Work**.*
- *Crews shall clearly show the number of **equipment** and **personnel** within each activity and work hours for **overtime** calculations.*
- *Estimates of cost for items of Work shall be further divided into the Contractor's customary cost categories such as **man-hours, labor, permanent materials, expendable materials, equipment ownership and operation, and subcontract cost**, as appropriate.*

18 CM-GC

Example: I-215 Barton Road Interchange

- *The Construction Manager shall designate information it considers to be confidential.*
- *CM will work with the Department to develop the proposed form for the Cost Model and the GMP.*
- *The Cost Model will be continually updated and kept current as the design progresses throughout the Preconstruction Phase.*
- *The CM shall communicate to the Project Team any assumptions made in preparing the Cost Model.*

Example: I-215 Barton Road Interchange

Each cost model shall include:

- *Material costs, equipment costs, labor costs, General Conditions costs, hourly labor rates, and total cost. Labor costs in the Cost Model shall include employee benefits, payroll taxes and other payroll burdens. The total cost for any portion of the work to be performed by subcontractors shall include subcontractor overhead and profit; [. . .]*

Peer Exchange:
Guest Speaker

Jeffrey T. Folden, PE, DBIA
Director, I-495 & I-270 P3 Office
Maryland Department of Transportation
State Highway Administration

Today's Learning Objectives

- **Phases and strategies** – Introduce the *preconstruction* phase and the *preconstruction services quality* strategy
- **Tools** – Explain the following tools, illustrated with examples from DOTs:
  - In-progress design workshops
  - Over-the-shoulder reviews
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  - Scope validation period
  - Public announcement
  - Delegation of authority
- **Peer exchange** – Discuss examples and tips for agencies to implement these tools in ACM projects

Scope Validation Period

Scope Validation Period

- What is it?
  - A predetermined period when the contractor can review all existing contract documents to identify any defects, errors, or inconsistencies
- Why use it?
  - Clearly identify any project scope issues to avoid disputes or added cost or schedule delays later

Scope Validation Period

- When to use it?
  - After the contract is awarded, typically 90 to 120 days, and prior to the kickoff meeting

	Contract Administration Phase				Project Complexity			Project Size		
	Alignment	Design	Construction	Closeout	Noncomplex	Moderately Complex	Complex	≤ $10 million	$10 million–$50 million	> $50 million
19 Scope Validation Period	✓	✓			●	●	●	●	●	●

Note: ● = Recommended; ◗ = Consider case by case; ○ = Not recommended.

19 D-B

Scope Validation Period

- How to use it?
  - Agency should provide clear guidelines in the RFP, including the intention of the scope validation period, the start date and end date, and documentation needed to submit scope issues

Scope Validation Period

- Synthesis of Examples
  - Considered a milestone or a gated process
  - Details of the process can be adapted to the complexity of projects

- Guidebook Example
  - CM-GC p.103

Example: VDOT Scope Validation Period

- From NTP + 120 days, Design-Builder shall thoroughly review and compare all Contract Documents to verify and validate Design-Builder's proposed design concept and identify any defects, errors, or inconsistencies ("scope issues") and 30 days for non-accessible areas.

- After this period, Design-Builder shall assume and accept all risks, costs, and responsibilities of any Scope Issue arising from or relating to the Contract Documents.

Peer Exchange:
Guest Speaker

Bryan Stevenson, PE, DBIA
Senior Project Delivery Engineer
Alternate Project Delivery
Virginia Department of Transportation

Today's Learning Objectives

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Public Announcement

Public Announcement

- What is it?
  - Communication that explains what D-B or CM-GC is and the benefits it brings to a specific project
- Why use it?
  - Builds understanding, trust, and community support for a project

20 D-B
19 CM-GC

ALIGNMENT

Public Announcement

- When to use it?
  - As needed throughout a project

	Contract Administration Phase				Project Complexity			Project Size		
	Alignment	Design	Construction	Closeout	Noncomplex	Moderately Complex	Complex	≤ $10 million	$10 million–$50 million	> $50 million
20 Public Announcements		✓	✓	✓	○	●	●	◗	●	●

Note: ● = Recommended; ◗ = Consider case by case; ○ = Not recommended.

20 D-B
19 CM-GC

Public Announcement

- How to use it?
  - Share with the public and media
  - Newsletters, website updates, paper announcements distributed at public meetings

20 D-B
19 CM-GC

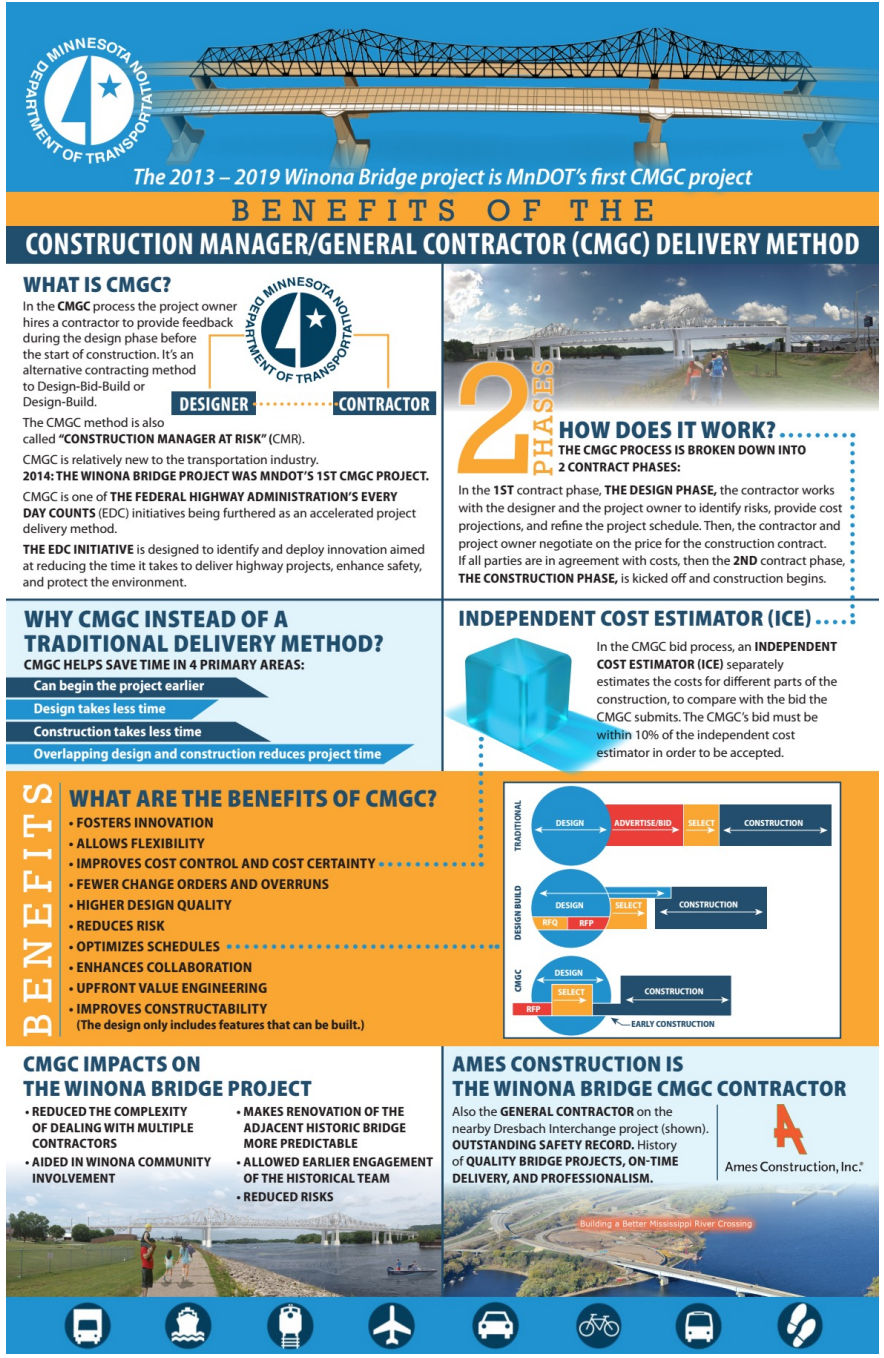
Public Announcement

- Synthesis of Examples
  - Includes special articles and sections developed for newsletters, blogs, social media, etc.

- Guidebook Example
  - D-B p.117-120
  - CM-GC p.114-118

20 D-B
19 CM-GC

Example: MNDOT



20 D-B
19 CM-GC

Example: UDOT Innovative Contracting webpage

INNOVATIVE CONTRACTING

JULY 10, 2013

In recent years UDOT has been able to implement innovative bridge building techniques but do you know what the impetus for this was? It started with innovative contracting. By utilizing these types of contracts we are able to involve the construction industry earlier for more efficient delivery of our projects.

We use three basic contract types: design-bid-build (DBB), design-build (DB) and construction manager/general contractor (CMGC). Each has its own benefits and risks and UDOT project managers, in coordination with UDOT senior leaders, determine early on what type of contract will meet the needs of their project and ultimately provide the best product (aka road, bridge, etc.).

The Colorado River Bridge project was completed using DBB. A specialty designer was hired and then also contracted to assist with inspection during construction.

Design-Bid-Build

DBB is our traditional method of contracting and is the most familiar to everyone. With these contracts a designer completes their part of the process before a construction contractor is involved. Basically, the name explains it all: first the **design** is completed, then it is put out for **bid** and finally a contractor is selected to **build** the project. The majority of our projects use this type of contract.

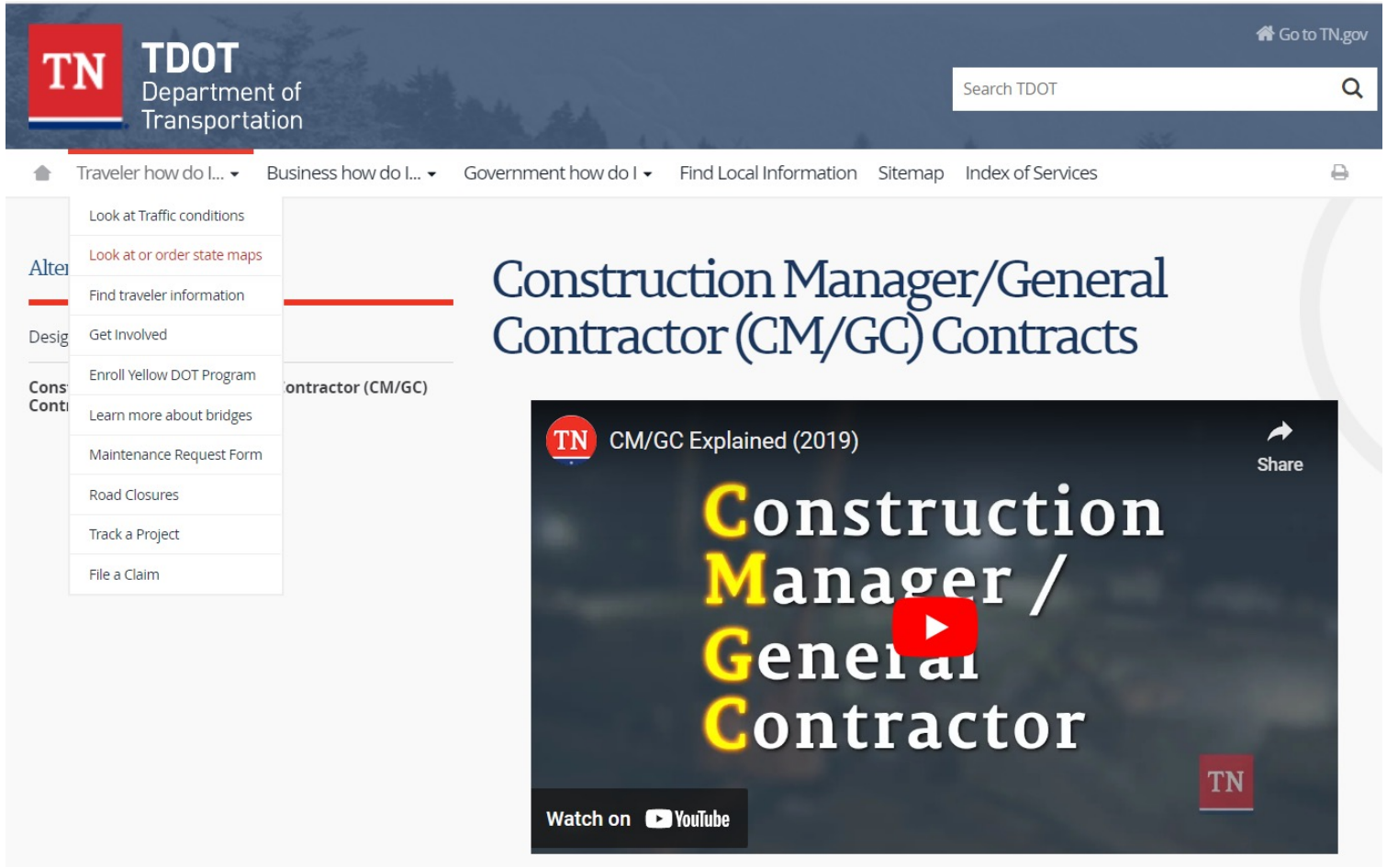
Design-Build

DB came about as a result of the 2002 Winter Olympics. The executive director at the time was Tom Warne and I-15

20 D-B
19 CM-GC

https://site.utah.gov/connect/2013/07/10/innovative-contracting/

Example: TDOT video CM-GC Explained



https://www.tn.gov/tdot/tdot-construction-division/transportation-construction-alternative-contracting/construction-cm-gc-services.html

20 D-B
19 CM-GC

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  - Delegation of authority
- **Peer exchange** – Discuss examples and tips for agencies to implement these tools in ACM projects

Delegation of Authority

Delegation of Authority

- What is it?
  - Agency empowers the agency engineer managing the project to make technical and budget decisions within specified limits
- Why use it?
  - Project decisions are timely and made by someone familiar with the project

21 D-B
20 CM-GC

SCOPE

DESIGN QUALITY

Delegation of Authority

- When to use it?
  - Write at the end of procurement for use throughout the project.

	Contract Administration Phase				Project Complexity			Project Size		
	Alignment	Design	Construction	Closeout	Noncomplex	Moderately Complex	Complex	< $10 million	$10 million–$50 million	> $50 million
21 Delegation of Authority		✓	✓	✓	●	●	●	●	●	●

Note: ● = Recommended; ◗ = Consider case by case; ○ = Not recommended.

21 D-B
20 CM-GC

Delegation of Authority

- How to use it?
  - Prioritize project acceleration by delegating decision-making authority to the agency project manager familiar with the project

21 D-B
20 CM-GC

Delegation of Authority

- Synthesis of Examples
  - Establish delegated authority prior to when needed
  - Clearly define extent of authority
  - Upper management support for person holding delegated authority
  - More than change orders, also include design exceptions and other agreements

- Guidebook Examples
  - D-B p.123; CM-GC p.120-121

21 D-B
20 CM-GC

Example: UDOT RE Contingency

Resident Engineer contingency:

- This amount will be a minimum of $5,000 and a maximum of $25,000 per project and will be included as a non-bid item in the contract.
- Use RE contingency during construction to make minor adjustments to the contract for items that do not require a change order when these adjustments will not change the project scope

21 D-B
20 CM-GC

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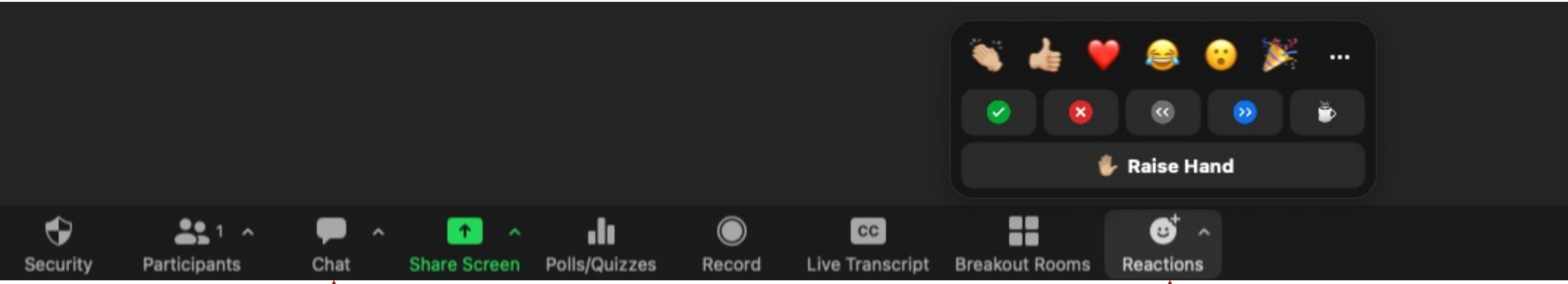
Peer Exchange: Discussion

Q and A

- Chat or raise your hand



Wrap-up

Today's Learning Objectives

- **Phases and strategies** – Introduce the *preconstruction* phase and the *preconstruction services quality* strategy
- **Tools** – Explain the following tools, illustrated with examples from DOTs:
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  - Over-the-shoulder reviews
  - Open-book estimating
  - Scope validation period
  - Public announcement
  - Delegation of authority
- **Peer exchange** – Discuss examples and tips for agencies to implement these tools in ACM projects

Key Takeaway Points

- **In-progress design workshops** support problem-solving and a consistent understanding of the project design across team members.
- **Over-the-shoulder reviews** allow the agency to provide informal feedback on design and determine if it meets the agency's requirements.
- **Open-book estimating** allows the agency to review the contractor's estimating records.
- **Scope validation period** helps identify project scope issues early to avoid later disputes and/or extra cost and time.
- **Public announcements** help the public understand the advantages of using D-B or CM-GC for this project.
- **Delegation of authority** empowers the resident engineer to make timely decisions for the project.

PROGRESS UPDATE

Tools for D-B and CM-GC contract administration	Contract administration phase: Alignment	Design	Preconstruction (CM-GC only)	Construction	Closeout	Project complexity: Non-complex	Moderately complex	Complex	Project size: ≤ $10 M	$10 M - $50 M	> $50M
Kickoff meeting	✓					●	●	●	●	●	●
Roles and responsibilities	✓					◗	●	●	●	●	●
Confidential one-on-one meeting	✓					◗	●	●	◗	●	●
Glossary of terms	✓					●	●	●	●	●	●
Co-location of key personnel	✓	✓	✓			○	◗	●	○	◗	●
Regulatory agency partnering	✓	✓	✓			○	●	●	◗	●	●
External stakeholder coordination plan	✓	✓				◗	●	●	◗	●	●
CM-GC management fee table	✓	✓	✓	✓	✓	◗	●	●	◗	●	●
ACM-specific partnering	✓	✓	✓	✓	✓	◗	●	●	◗	●	●
Continuity of team members	✓	✓	✓	✓	✓	◗	●	●	◗	●	●
FHWA involvement overview	✓	✓	✓	✓	✓	●	●	●	●	●	●
Permit commitment database	✓	✓	✓	✓	✓	◗	●	●	●	●	●
Plan standards		✓	✓			◗	◗	●	◗	●	●
Deviations from agency standards		✓	✓			◗	●	●	◗	●	●
Discipline task force		✓				○	◗	●	◗	●	●
Independent party design review		✓				○	●	●	○	●	●
Cost savings matrix		✓				◗	●	●	◗	●	●
In-Progress design workshops		✓	✓			◗	●	●	●	●	●
Over-the-shoulder reviews		✓	✓			◗	●	●	●	●	●
Scope validation period	✓	✓				●	●	●	●	●	●
Public announcements		✓	✓	✓	✓	○	●	●	◗	●	●
Delegation of authority		✓	✓	✓	✓	●	●	●	●	●	●
Open-book estimating			✓	✓		◗	●	●	◗	◗	●

Tools for D-B and CM-GC contract administration	Contract administration phase: Alignment	Design	Preconstruction (CM-GC only)	Construction	Closeout	Project complexity: Non-complex	Moderately complex	Complex	Project size: ≤ $10 M	$10 M - $50 M	> $50M
Cost comparison spreadsheet			✓			◗	●	●	◗	●	●
Cost modeling approach			✓			◗	●	●	◗	●	●
CM-GC bid validation			✓			◗	●	●	◗	●	●
Independent cost estimator			✓			◗	●	●	◗	●	●
Opinion of probable construction cost			✓			◗	●	●	◗	●	●
Risk pools			✓	✓		○	●	●	◗	●	●

● = Recommended; ◗ = Consider Case-by-Case; ○ = Not Recommended

Next: Session 6

- Thursday October 27, at 10:00 AM Pacific
- For preparation, preview the following 6 tools:
  - Cost-comparison spreadsheet
  - Cost-modeling approach
  - CM-GC bid validation
  - Independent cost estimator
  - Opinion of probable construction cost
  - Risk pools

Learning Assessment

1. T/F: The preconstruction services quality strategy…
2. T/F: In-progress design workshops can be…
3. Single Answer: During the scope validation period…
4. Open feedback.

OPEN DISCUSSION