Overcoming Challenges to Using 3D Models for Construction

September 10, 2014

1:00 pm – 2:30 pm EST

Every Day Counts

U.S. Department of Transportation
Federal Highway Administration

Welcome and Introductions

Douglas Townes, P.E.
FHWA Resource Center

U.S. Department of Transportation
Federal Highway Administration

Today's Speakers

Speaker	Topic
Douglas Townes *FHWA-Resource Center*	Welcome, Introductions & Previous Webinar Information
Alexa Mitchell *Missouri DOT Design*	Challenges Delivering 3D Data to Construction at a DOT
Mike Momrow *Rifenburg Companies*	Implementing 3D Modeling as a Contractor
Brett Dean *New York State DOT Construction*	Implementing 3D Modeling in a State Construction Office
Douglas Townes *FHWA-Resource Center*	FHWA Resources to Support Implementation
Francesca Maier *Parsons Brinckerhoff*	Moderated Question & Answer Session
Douglas Townes *FHWA-Resource Center*	Information on Next Webinar and Close

Audience Demographics Polls

Please respond to the polls on screen.

3D Engineered Models Webinar Series

Webinar 1: Overview of 3D Models for Construction
Webinar 2: Creating 3D Engineered Models
Webinar 3: Applications of 3D Models in the Contractor's Office
Webinar 4: Applications of 3D Models on the Construction Site
Webinar 5: Managing and Sharing 3D Models for Construction
Webinar 6: Overcoming Challenges to Using 3D Models for Construction
Webinar 7: Implementing 3D Engineered Models for Construction
Webinar 8: Adding Time, Cost and other Information to 3D Models

Recordings of Previous Webinars

http://www.fhwa.dot.gov/construction/3d/webinars.cfm

U.S. Department of Transportation
Federal Highway Administration

About Programs Resources Briefing Room Contact Search FHWA

3D Engineered Models

FHWA / Programs / Construction / Technologies and Innovations / 3D Engineered Models / 3D Engineered Models Webinar Series

3D Engineered Models | Accelerated Construction | Intelligent Compaction | Slide-in Bridge Construction | SHRP2

Surveying | 3D Design | Construction | Post-Construction | Training | Resources

3D Engineered Models Webinar Series

One of the technologies for the FHWA's Every Day Counts (EDC) initiative is 3D Engineered Models for Construction. A series of eight webinars have been developed to assist the FHWA's transportation partners in adopting this proven technology. The webinars are given in a "cradle to grave" sequence. Participants will hear how contractors incorporate 3D engineered models in their workflow of bidding and preparing to execute construction. Topics and guest speakers include:

Recorded Webinars

- Overview of 3D Engineered Models for Construction
  November 20, 2013 1:00 p.m. - 2:30 p.m. Eastern
- Creating 3D Engineered Models
  January 8, 2014 1:00 p.m. - 2:30 p.m. Eastern

Need more help?

Contact the Technical Support Services Center (TSSC) for a fast, personal response to your specific questions from a national technical expert in 3D engineered models.

Social Media

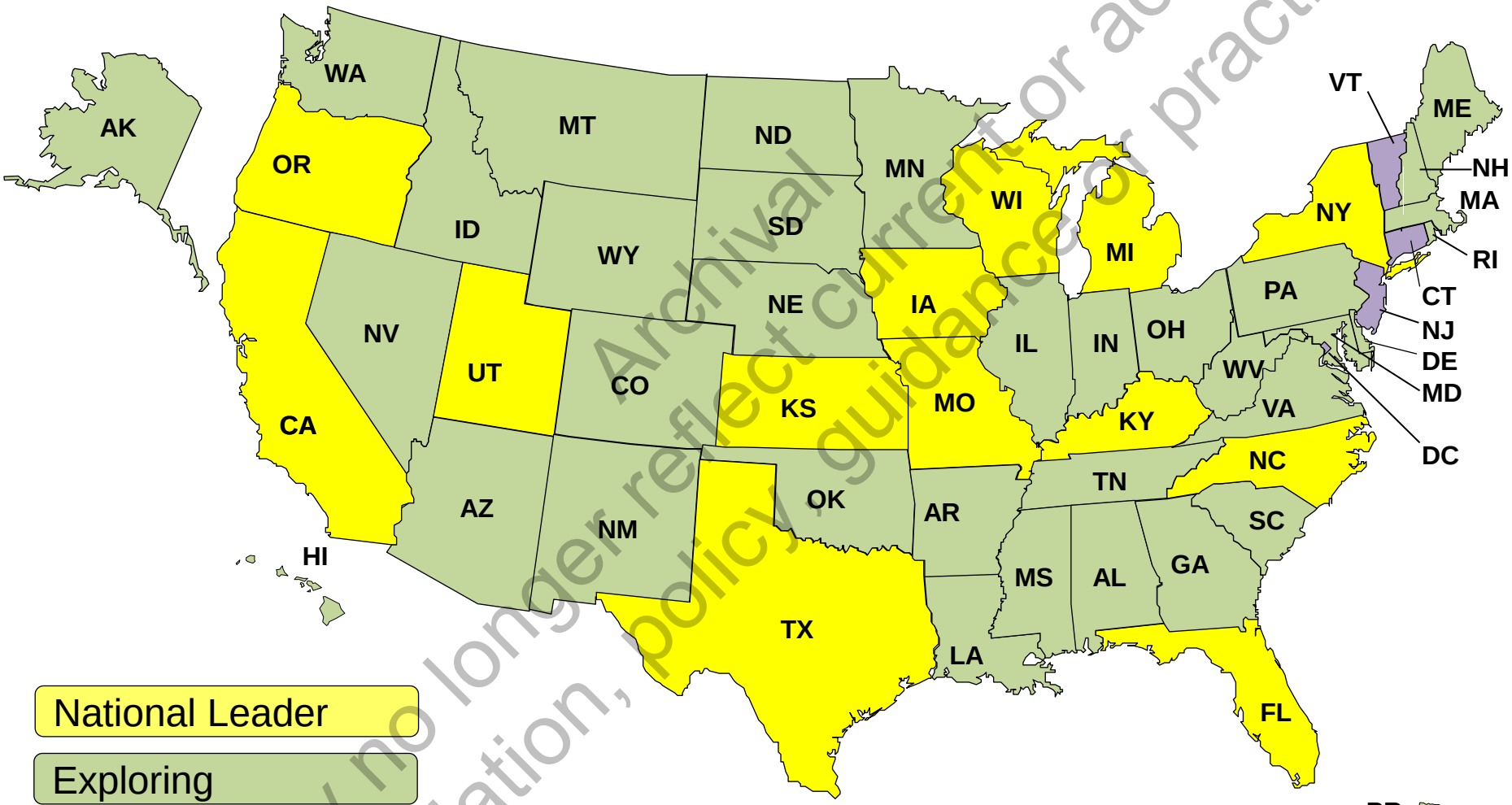
Tweet along on Twitter:

#EDC2 @USDOTFHWA

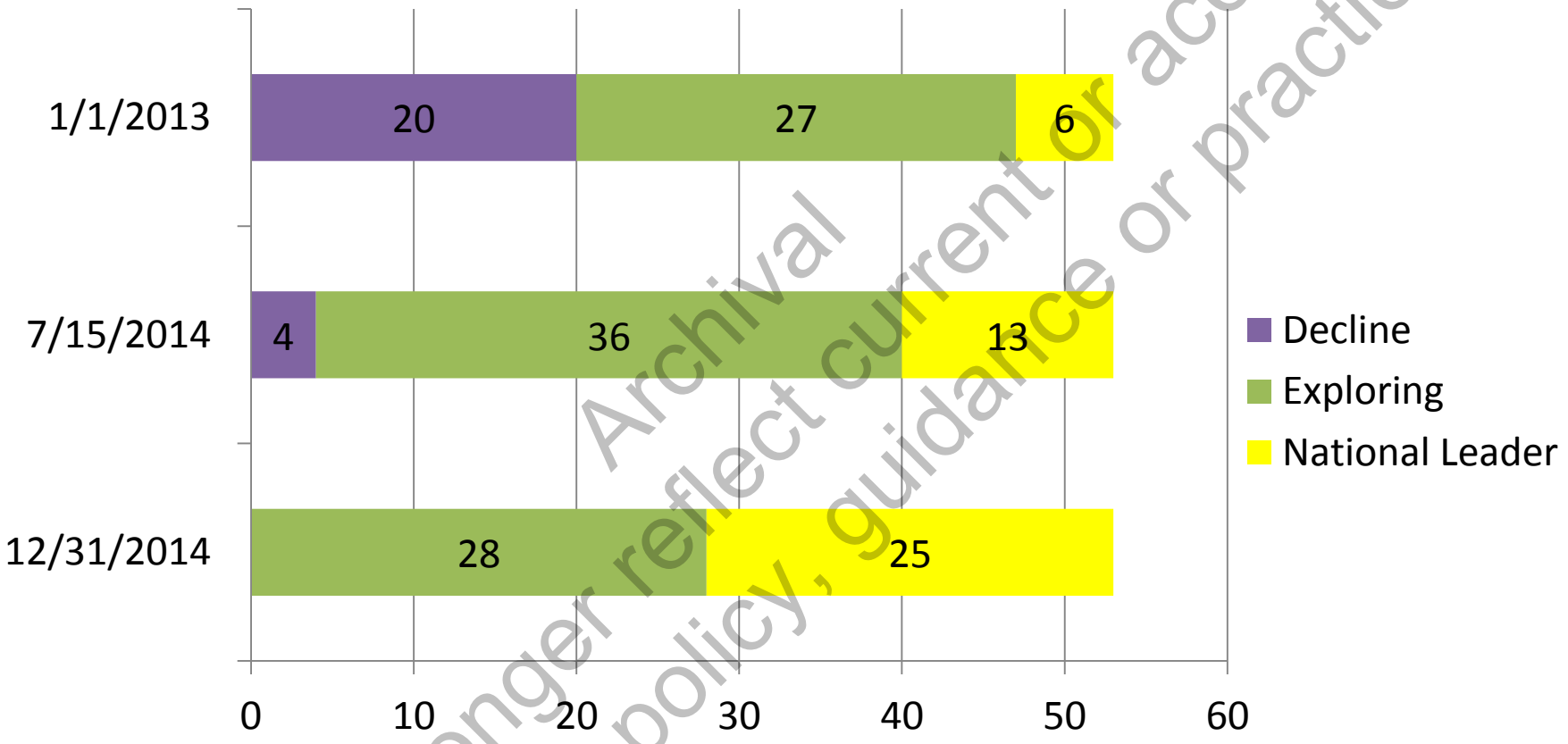
Learning Objectives

- Discuss the national state of the practice for 3D Engineered Models for Construction
- Discuss common challenges to implementation
- Discuss lessons learned during the implementation process
- Identify resources to assist organizations to implement 3D Models for Construction

Status as of July 2014



Deployment Status and Goal



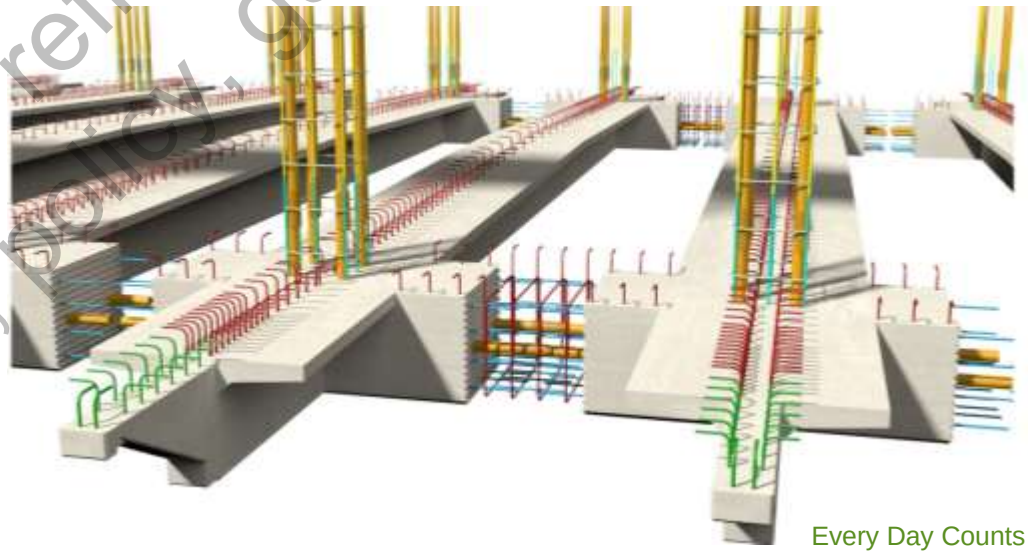
Definitions:

National Leader	Has constructed 2 or more projects using 3D technology
Exploring	Investigating and/or piloting 3D technology
Decline	Not taking part in national EDC technology initiative

National Goals

By December 31, 2014

- Construct 50 projects nationwide using 3D models; and,
- Construct two 3D projects by at least 25 distinct transportation facility owners.



Challenges Delivering 3D Data to Construction at a DOT

Alexa Mitchell, PE

Missouri Department of Transportation

Every Day Counts
innovation ingenuity imagination invention

U.S. Department of Transportation
Federal Highway Administration

Identified Challenges from Webinar #1

1. Lack of guidelines or best practices
2. Lack of $ to set up technical infrastructure (storage, bandwidth, accessibility, etc.)
3. Mismatched technological advances (software vs. hardware)
4. Lack of expertise
5. Lack of investment in training and technology
6. Accelerated deadlines = no time to learn
7. Lack of consistency from contractors
8. Legality of 3D data for bidding purposes

Audience Poll

Please respond to the polls on screen.

What have we overcome?

Challenge #1: Lack of guidelines or best practices…

- EDC Workshops
- Agency Collaboration
- Shared Best Practices

Still needs work…

…But better than where we started

What have we overcome?

Challenge #2:

Lack of $ to set up technical infrastructure

The lack of funding still exists…

…Transportation funding needs to be addressed

…Funding for IT resources

to support transportation

What have we overcome?

Challenge #3: Mismatched technological advances

Still a challenge…but we can get better if…

Replacement of aging infrastructure and IT resources needs to be a programmatic process

Be proactive not reactive…easier said than done…again FUNDING is the issue

What have we overcome?

Challenge #4: Lack of expertise

Some agencies are farther ahead than they think…

Collaboration is the key to success…

- Agency-agency
- Industry partners

What have we overcome?

Challenge #5

Lack of investment in training and technology

Do the best you can with what you have

- Re-prioritize with end goal in mind
- Create an action plan
- Train-the-trainer program
- Using current resources differently
- Online resources
- Training options in software contracts as PS

What have we overcome?

Challenge #6: Accelerated deadlines = no time to learn

So true and WILL NEVER change…

…It's the nature of our business, but…

- Get the support of your leadership – focus on value added
- Spend 90% of your implementation in development mode
- Put yourself in the shoes of the production user
- Provide plenty of guidance and technical support
- Continued education in an attempt to keep up with technology

What have we overcome?

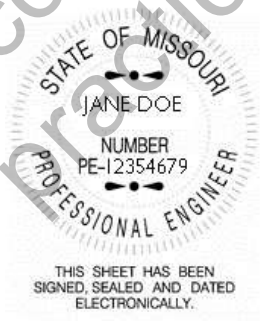
Challenge #7:

Lack of consistency from contractors

- Have a better understanding of what is needed
- More is better, but anything is better than nothing

Electronic data in Missouri…

Electronic plans



Electronic engineering data

Using volumetric quantities vs. end-area-method calculation

One last thought…

- Identify challenges under your control
- Create a plan that works for your agency
- Don’t be afraid to ask for help
- Learn what others do to guide you in your decision making
- Keep it simple

Thank You

Contact Information
Alexa Mitchell, PE
CADD Services Engineer
573-751-6591
Alexa.Mitchell@modot.mo.gov

Audience Poll

Please respond to the polls on screen.

Implementing 3D Modeling as a Contractor

Mike Momrow

Rifenburg Companies

Every Day Counts
innovation ingenuity imagination invention

U.S. Department of Transportation
Federal Highway Administration

Getting Started

Scaling Operations

Challenges Not Yet Overcome

Audience Poll

Please respond to the polls on screen.

Implementing 3D Modeling in a State Construction Office

Brett Dean

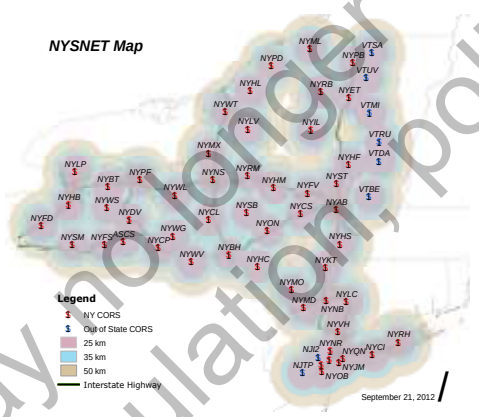
New York State Department of Transportation

Every Day Counts
innovation ingenuity imagination invention

U.S. Department of Transportation
Federal Highway Administration

Challenges

- Administrative
- Infrastructure
- Resources
- Equipment
- Support

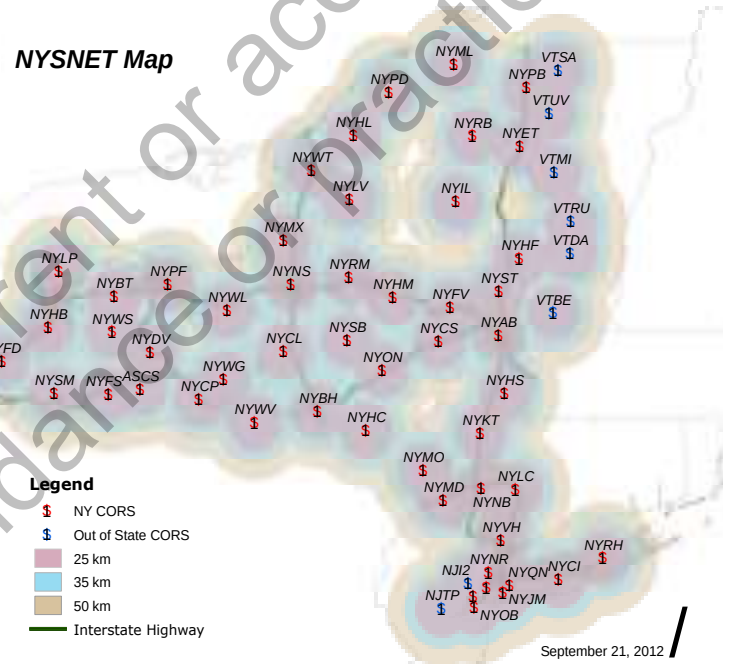


Administrative

- **Need Management's Involvement**
  - What it is
  - How it will be used/beneficial to Department
  - How much time/resources needed
  - Expected outcome
  - Costs
  - Return on Investment

Infrastructure

- CORS
- Electronic Data
  - Sharing Files
  - Work Flow
  - Post processing



Resources

- Regional Construction Survey Coordinator
- Regional Construction CADD Coordinator
  - Regional Support for Field Staff
    - Responsible for equipment, questions from projects, data collection, post processing, quantity calculations for payment, etc.
    - Often the same person
  - Dedicated Staff from Main Office
    - Address administrative, programmatic, training
    - Overall picture and common issues
      - Raise questions/issues up to Management level

Equipment

- GPS/Total Station/Digital Level/LiDAR Scanner
  - 2005 first GPS Equipment contract for Construction
    - Included in equipment contract for Design Survey
    - New Technology
    - Training

Support

- RCSC/RCCC
- Training
  - Equipment
    - Manufacturer - Contractually obligated yearly
    - Vendor - Contractor supplied via 625 Specification
    - In-House – Regionally and Project specific
  - Software
    - Manufacturer/Vendor – specific/proprietary
    - State-Wide – Bentley sponsored
    - In-House – Regionally - offered during winter
      - Support projects, answer questions/processes, How-To Guides

Contractor's Challenges

- Project Meetings
- Verifying technology to inspection staff
- Contract Control Plan
- Data Transfer

Standards Needed

- Data Formats
- How it will be used
- How we will verify
- How it will be paid for

Thank You

FHWA Resources to Support Implementation

Douglas Townes, P.E.
FHWA Resource Center

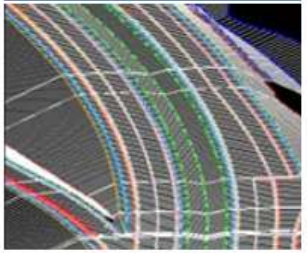
Every Day Counts
innovation ingenuity imagination invention

U.S. Department of Transportation
Federal Highway Administration

FHWA 3D Modeling Resources

FHWA 3D Modeling Website: http://www.fhwa.dot.gov/construction/3d/

Links to best practice documents and resources from external sources.

Surveying & Scanning	3D Data & Design	Construction & Automation	Post-Construction & Mapping	Education & Training	Technical Reports & Resources
					

Web Based Training NEW!	Workshops	Webinar Series	Field Demonstrations	Technical Services Support Center (TSSC)

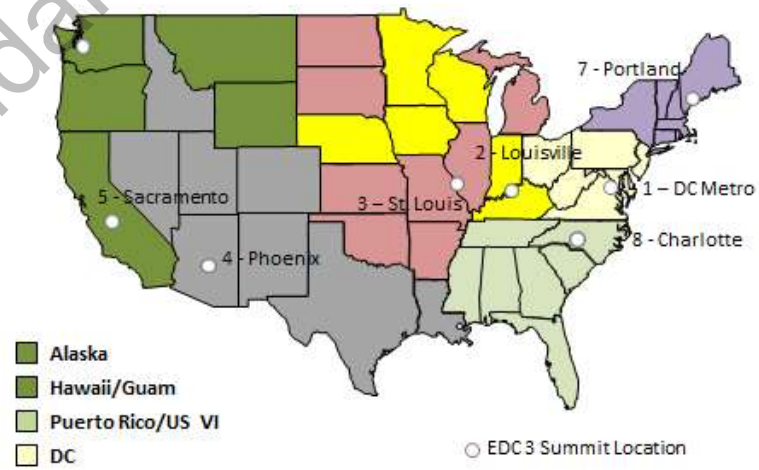
Links to FHWA authored resources for training and implementation support.

EDC3 – 3D Modeling continues

Emphasis will be on Cost, Schedule, and Post-Construction

- **Raw Data Capture, 4D/5D Modeling and Asset Management**

Summits begin October 7 – 8



More information:

http://www.fhwa.dot.gov/accelerating/edc3.cfm

Verify Learning Outcomes

- Discuss the national state of the practice for 3D Engineered Models for Construction
- Discuss common challenges to implementation
- Discuss lessons learned during the implementation process
- Identify resources to assist organizations to implement 3D Models for Construction

Moderated Question & Answer

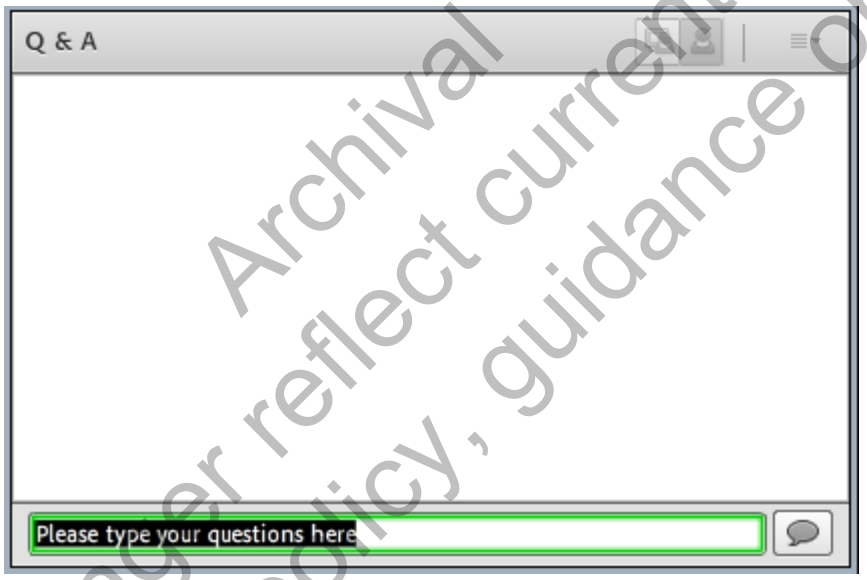
Francesca Maier, P.E.
Parsons Brinckerhoff

Every Day Counts
innovation ingenuity imagination invention

U.S. Department of Transportation
Federal Highway Administration

Question & Answer

Please add your questions to the Q&A Pod



You may add suggestions for polls!

Upcoming Webinars and Close

Douglas Townes, P.E.
FHWA Resource Center

U.S. Department of Transportation
Federal Highway Administration

3D Engineered Models Webinar Series

Webinar 1: Overview of 3D Models for Construction
Webinar 2: Creating 3D Engineered Models
Webinar 3: Applications of 3D Models in the Contractor's Office
Webinar 4: Applications of 3D Models on the Construction Site
Webinar 5: Managing and Sharing 3D Models for Construction
Webinar 6: Overcoming Challenges to Using 3D Models for Construction
Webinar 7: Implementing 3D Engineered Models for Construction
Webinar 8: Adding Time, Cost and other Information to 3D Models

Up Next: Webinar 7

Implementing 3D Models for Construction

October 15, 2014

1:00 pm – 2:30 pm

www.fhwa.dot.gov/3D

Douglas.townes@dot.gov