

Overcoming Challenges to Using 3D Models for Construction

September 10, 2014

1:00 pm – 2:30 pm EST



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

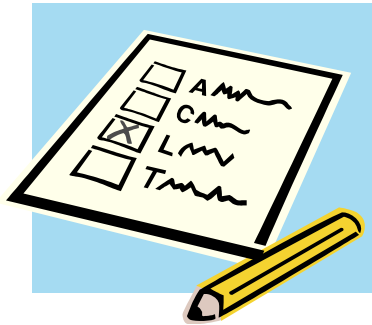


Today's Speakers

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

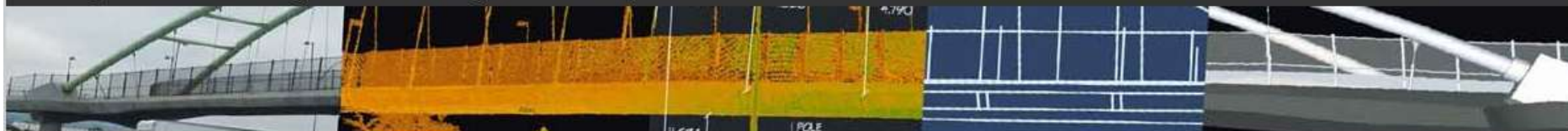
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3D Engineered Models

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:

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.

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



Social Media

Tweet along on Twitter:

#EDC2 @USDOTFHWA



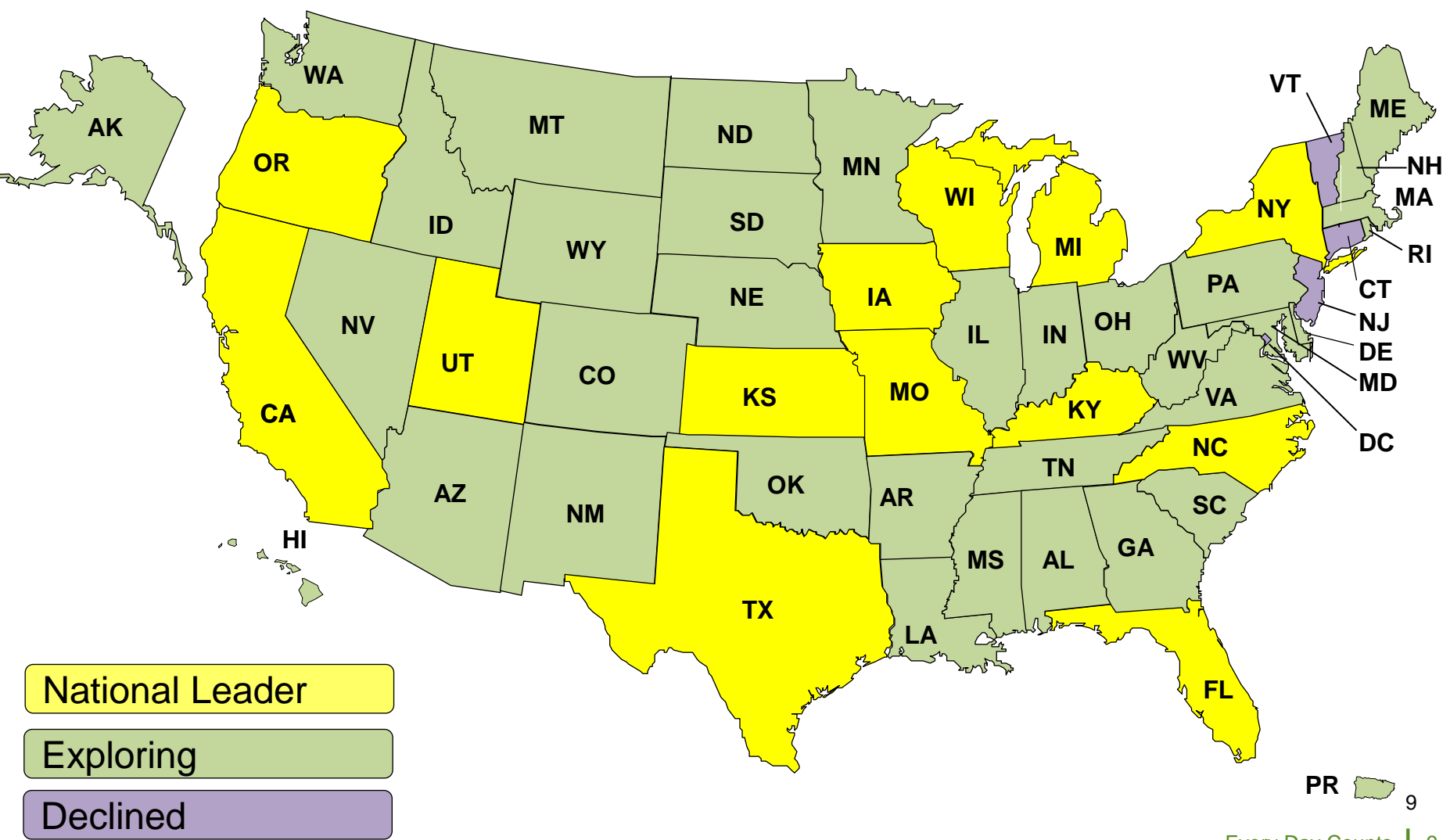


Learning Objectives

- 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

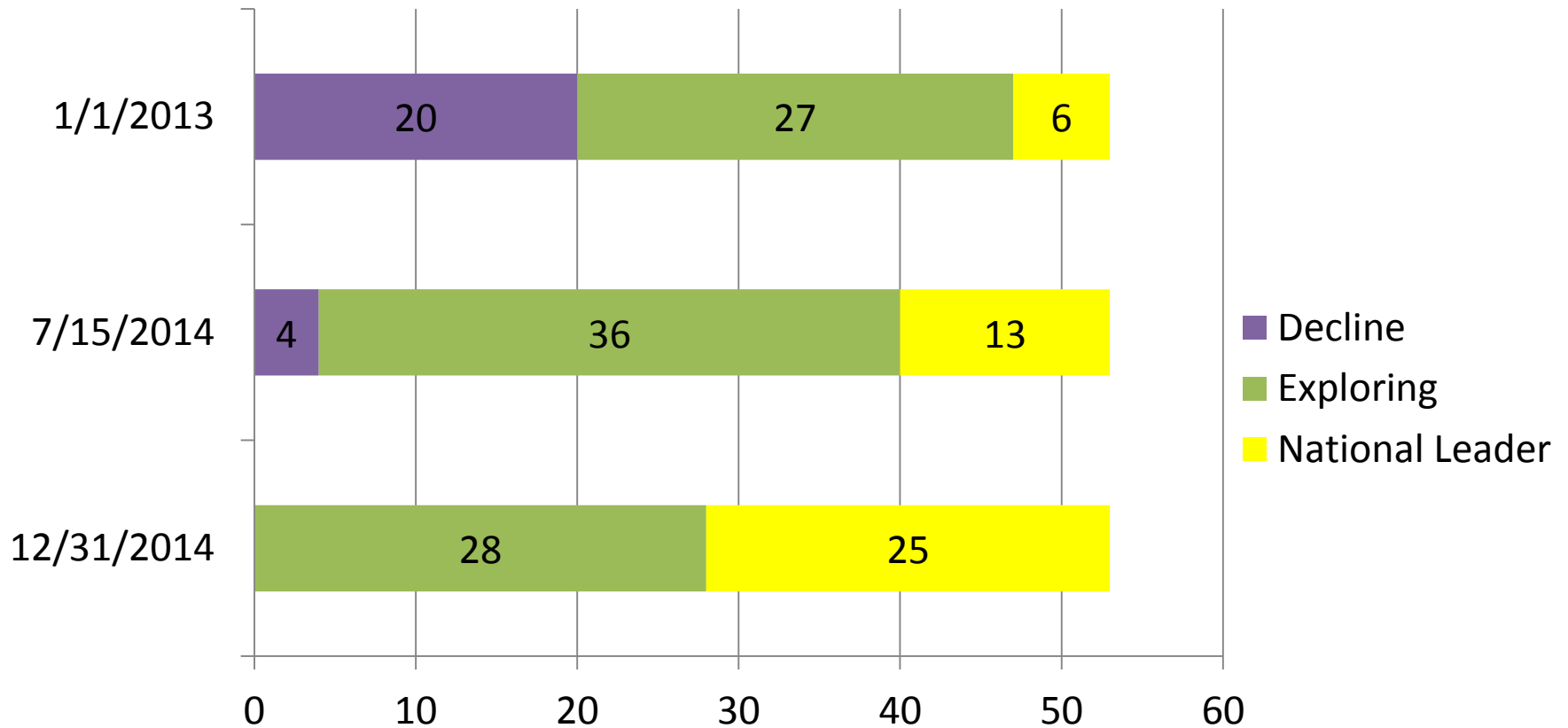


Status as of July 2014





Deployment Status and Goal



Definitions:

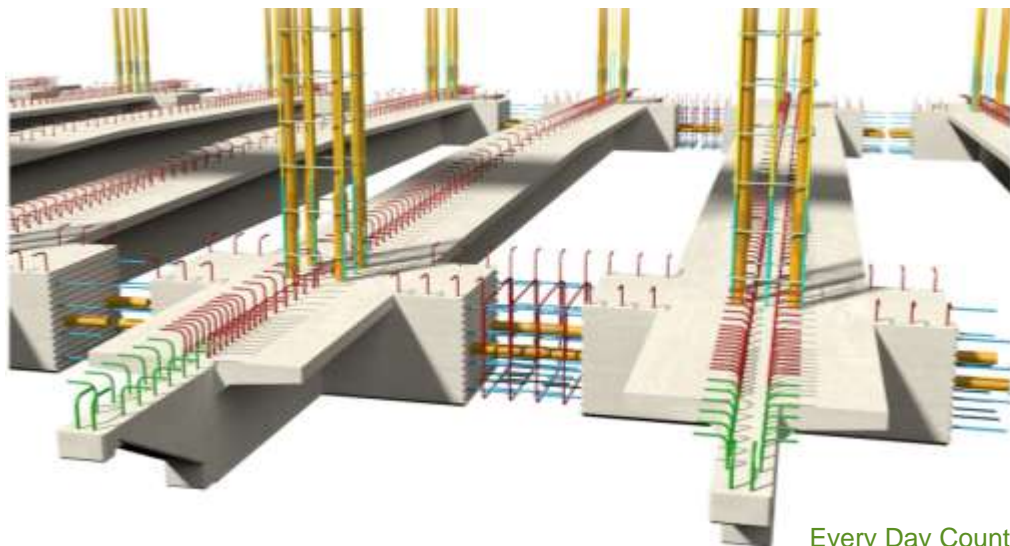
- National Leader Has constructed 2 or more projects using 3D technology
- Exploring Investigating and/or piloting 3D technology
- Decline Not taking part in national EDC technology initiative



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



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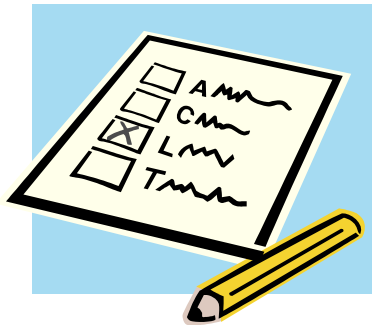


Identified Challenges from Webinar #1

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

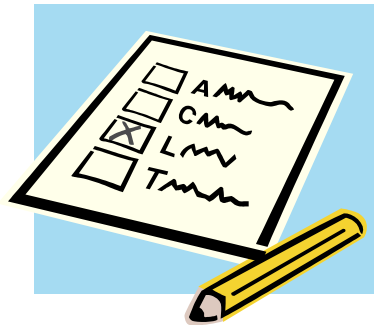
CADD Services Engineer

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



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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

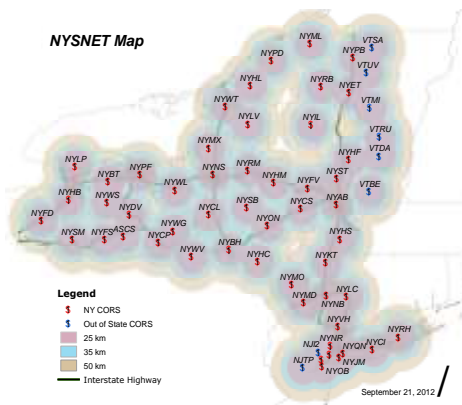


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Challenges

- Administrative
- Infrastructure
- Resources
- Equipment
- Support





Administrative

- **Need Management's Involvement**

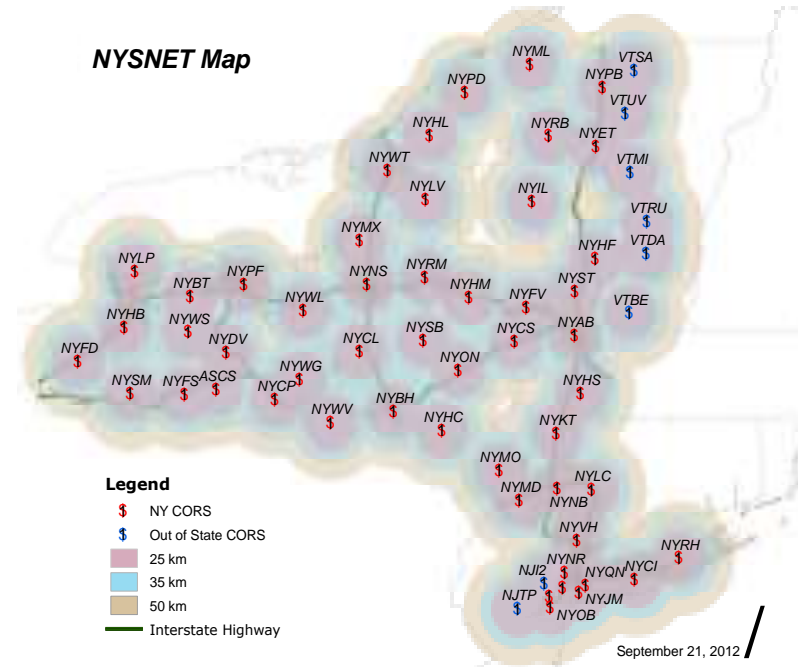
- What it is
- How it will be used/beneficial to Department
- How much time/resources needed
- Expected outcome
- Costs
- Return on Investment





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

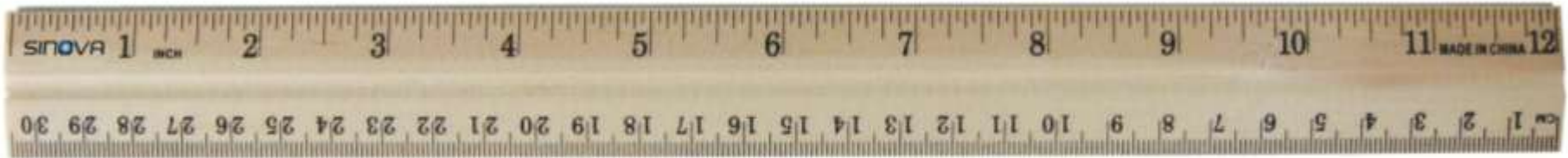
- Project Meetings
- Verifying technology to inspection staff
- Contract Control Plan
- Data Transfer





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



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FHWA 3D Modeling Resources

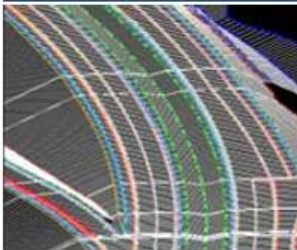
FHWA 3D Modeling Website: <http://www.fhwa.dot.gov/construction/3d/>

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

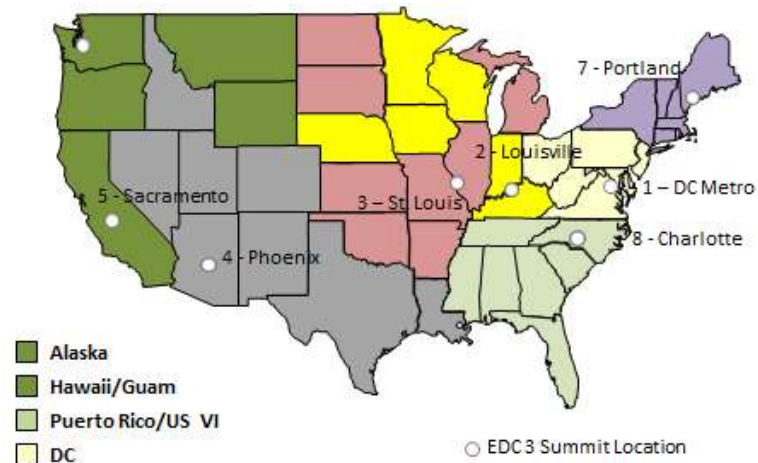
**Emphasis will be on Cost, Schedule,
and Post-Construction**

**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
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Moderated Question & Answer

Francesca Maier, P.E.
Parsons Brinckerhoff

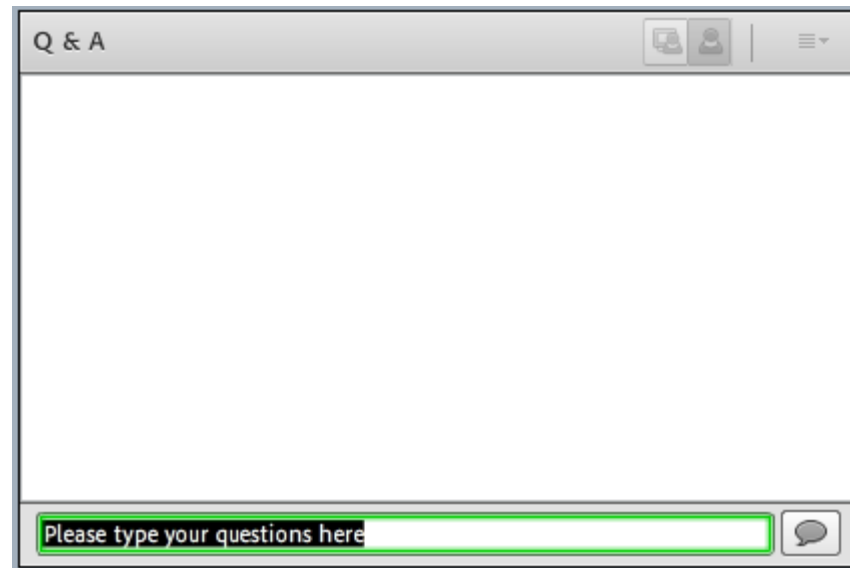


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Question & Answer

Please add your questions to the Q&A Pod



You may add suggestions for polls!

Upcoming Webinars and Close

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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