Using Model Based Delivery in Design & Construction

Tuesday, March 16, 2021 | 11am–1pm CDT

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TRB
TRANSPORTATION RESEARCH BOARD
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CALL RECORDING: *We are recording this webinar for future use.*

SHOWING AS ANONYMOUS?

No worries, that's how the Teams Live system logs you in.

If you type a message in the Q/A, you can either type your name in or stay as anonymous

ISSUES WITH YOUR AUDIO?

You probably have us muted or your volume is at zero. You'll need to change the settings on your computer's sound.

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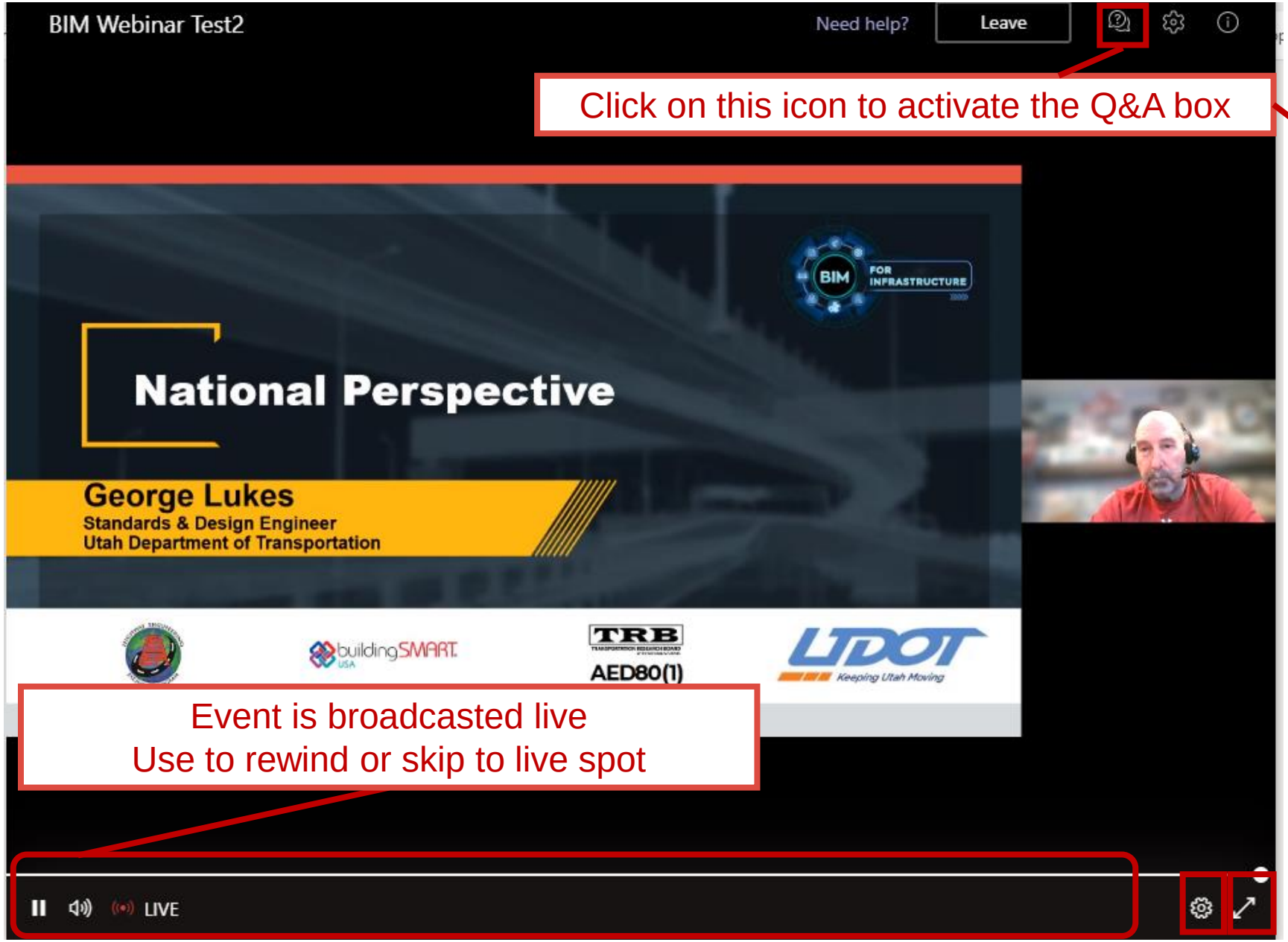

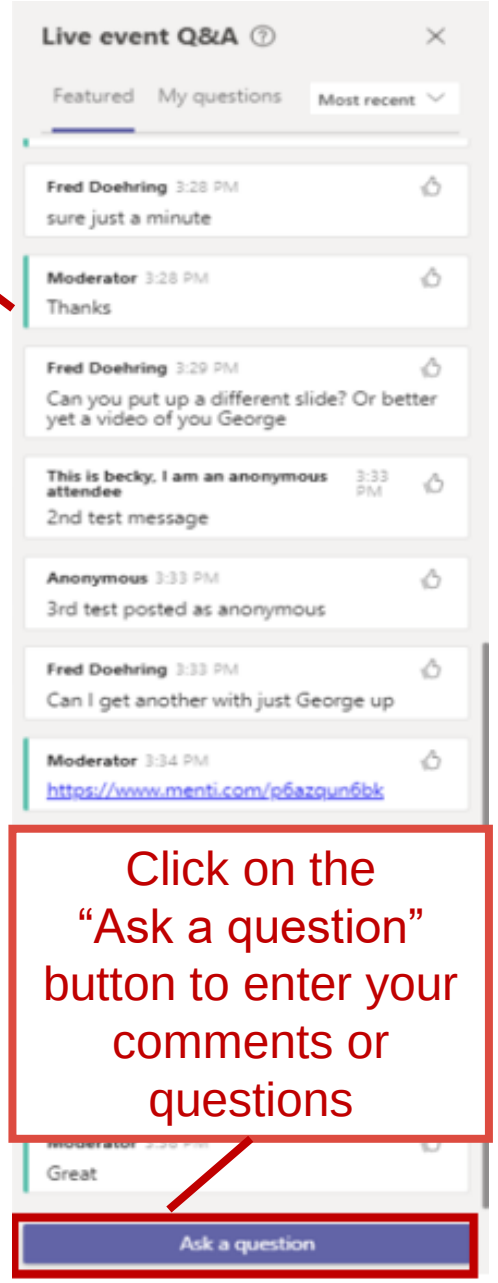

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www.menti.com

Type code: 8919 1465

Leave Mentimeter open and stay tuned for polls
If you close Mentimeter, you'll need to re-enter the code

Mentimeter: What's your background?

a. Public Agency
b. Contractor
c. Consultant
d. Academia
e. Vendor
f. Other: _____

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Webinar Introduction

George Lukes
Standards & Design Engineer
Utah Department of Transportation

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NATIONAL BIM FOR INFRASTRUCTURE INDUSTRY WEBINAR

Overview

This transportation industry online workshop is the first in a series that explores opportunities and challenges presented by the shift to Building Information Modeling (BIM) and model-based, digital delivery throughout the United States.

This virtual workshop will provide insights on the practical application of BIM for infrastructure and model-based, digital delivery related to the design and construction of transportation projects.

NATIONAL BIM FOR INFRASTRUCTURE INDUSTRY WEBINAR

Agenda

- An introductory plenary session on national BIM perspectives in Transportation
- State DOT's Perspective on moving to Digital Delivery and Model as the Legal Document
- Contractor Panel Discussion on using model-based digital delivery in construction

Mentimeter Results : What's your background?

a. Public Agency
b. Contractor
c. Consultant
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e. Vendor
f. Other: _____

Sponsors and Collaborators

The Highway Engineering Exchange Program (HEEP)

Promotes use of technology in the transportation engineering industry
Through **peer** exchange of:

Knowledge **Experience** **Best practices**

- 60+ years
- Non-profit International Organization
- Forum for Civil Engineers and IT Professional
- Managed by its members elected from the Transportation Agencies
- No membership fees

For more information visit WWW.HEEP.ORG

Who Participates HEEP?

The HEEP organization's membership is made up of:

Engineers **IT Professionals** **Technology Partners**

Transportation Agencies include:

US States **Canadian Provinces** **European Countries**

FHWA **Municipalities**

Technology Partners:

Consulting Engineering Companies

Contractors

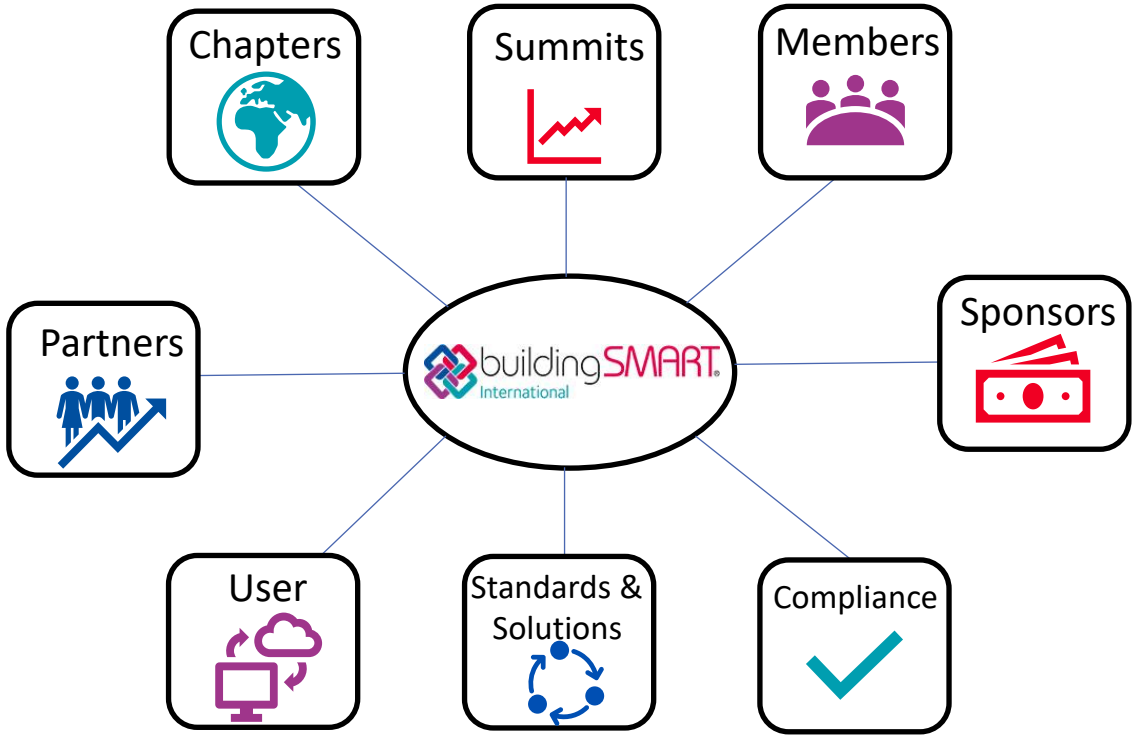
Transportation-related Technology Vendors

Academia

Sponsors and Collaborators

buildingSMART International

Mission: Enable full benefits from digital ways of working in the built asset industry through use of international open standards



buildingSMART USA

Mission: Engage US industry stakeholders

Website:
www.buildingSMARTusa.org

Email:
USA@buildingSMART.org

LinkedIn:
buildingSMART-USA

TRB AED80(1) - BIM for Infrastructure Sub-Committee

Fostering Applied Research and Development for the Implementation of BIM for Infrastructure within the Transportation Industry

Co-Host of BIM Webinars/Workshops

Focus Groups

- BIM - Highway Project Delivery-Design/Survey/Construction
- BIM - Asset Management/Operations & Maintenance
- BIM - Rail/Transit/Aviation/Marine Project Delivery
- BIM - Digital Delivery/Open Standards
- BIM - Performance/Data Analytics/AI
- BIM - Data Governance/Data Management/Big Data

Lance Parve, Co-Chair
BIM Director/Services Manager
WSP-USA Advisory Services
lance.parve@wsp.com

Charles Hixon, Co-Chair
Business Development Manager
Digital Construction Works
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https://www.trbviz.org

National BIM Perspectives in Transportation

Introductory Plenary Session

INCLUDING:

- AASHTO Joint Technical Committee on Engineering Standards
- AASHTO BIM for Infrastructure Pooled Fund Update
- AASHTO BIM for Bridges and Structures Pooled Fund Update

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AASHTO Joint Technical Committee on Electronic Engineering Standards Overview

Mike Kennerly
Chair, JTCEES, Iowa DOT

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Joint Technical Committee on Electronic Engineering Standards (JCTEES)

- Chair: Michael Kennerly, Iowa DOT
- Vice Chair: Jennifer Lloyd, TDOT
- 17 State Transportation Agencies
- 2 Consulting firms (HDR, CDM Smith)
- FHWA
- Bentley
- Autodesk
- Trimble
- AGC
- Friends
- Highway Design, Bridges and Structures, Construction and Maintenance

Goals of the Committee

1. Identify the **data** that needs to be transferred **at various stages of project delivery, construction, maintenance and asset management**. The goal is to ensure data can be transferred seamlessly, thereby minimizing rework, and ensuring that agencies and our industry partners have the information they need to effectively and efficiently manage these transportation assets throughout their lifecycle.
2. The industry has long recognized the need for a **non-proprietary or open file format** that ensures interoperability and is accepted as the industry standard. Although several non-proprietary and open formats have been developed no single standard or group of standards have been adopted. The goal of the committee would be to develop and recommend a plan to adopt and industry standard.
3. Conduct a **synthesis of best practices on implementing 3D infrastructure information models**. The synthesis should focus on the issues associated with creating 3D models and progressing from models that are for information only to models that are the controlling document and serve as a source of data for asset management

Initial JTCEES Work Plan

1. Conduct a survey to determine where we need to focus our efforts and where the industry is headed. (Completed)
2. Develop guidance on level of detail, level of development, and level of accuracy in a model centric environment. (Ongoing)
3. **Recommend direction for enhancing interoperability. (Completed/Ongoing)**
4. Develop guidance on an electronic/intelligent plan of Building Information Model (BIM). (Ongoing)

Interoperability: Think of Our Data as in a Relationship

But unfortunately,
it doesn't communicate
very well…

The Lack of Communication Comes at a Steep Price

"The US National Institute of Standards and Technology estimated the cost of inadequate interoperability within the Property, Construction and Facility Management industry at $15.8 billion per year."

–Semantic Scholar

AASHTO Adoption of IFC

- In October 2019 the Joint Technical Committee on Electronic Engineering Standards introduced a **resolution to adopt IFC** as the standard for State Departments of Transportation.
- The resolution passed unanimously with the following provisions;
  - ***Resolved,*** That the AASHTO Board of Directors **recommends the adoption of IFC Schema** as the national standard for AASHTO States;
  - ***Resolved,*** That an internal, **cross-committee, multi-disciplined** group within AASHTO should be formed to coordinate schema development, identify gaps, resolve any conflicts, and avoid duplication of efforts; and
  - ***Resolved,*** That **possible AASHTO membership in buildingSMART International** should be investigated to provide representation and participation for the state DOTs in schema development.

Initial JTCEES Work Plan

- BIM Maturity Model
- Level of Development Guide
- Guidance for Developing a BIM/Intelligent Plan
- Guidance on BIM and Asset Management
- Webinar Series on BIM related topics

AASHTO BIM for Infrastructure Pooled Fund Update

Mike Kennerly
Chair, JTCEES, Iowa DOT

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Upcoming BIM for Infrastructure Pooled Fund Study

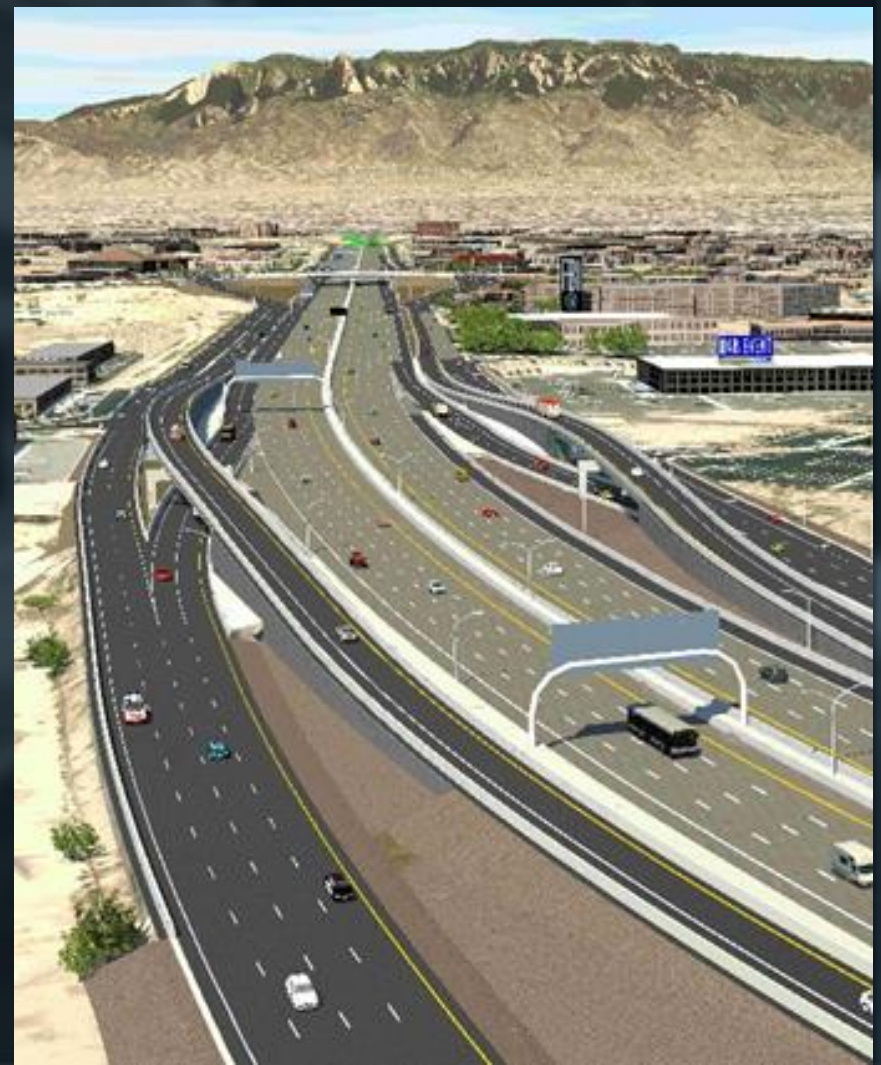
AGENCIES COMMITTED TO DATE

- Iowa DOT (Lead State)
- FHWA
- Arizona DOT
- Kentucky Transportation Cabinet
- Michigan DOT
- New York State DOT
- Pennsylvania DOT
- Texas DOT

SCOPE OF WORK

- Develop BIM use case and workflows
- Establish BIM processes
- Enhance skills and collaboration
- Deploy data management tool and technique
- Information exchange

Transportation Pooled Fund - Solicitation Details:
https://www.pooledfund.org/Details/Solicitation/1547



Mentimeter: What are suggestions for areas of focus for the new BIM for Infrastructure Pooled Fund Study? (Select all that apply).

a. Establish open standards for data exchanges throughout project lifestyle
b. Guidelines on model based digital delivery level of detail and level of information
c. Industry coordination and collaboration
d. Digital As-Built information requirements
e. Best Practices for moving to model based digital delivery
f. Business case for moving transportation industry to digital delivery
g. Other: _____

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AASHTO BIM for Bridges and Structures Pooled Fund Update

Ahmad Abu-Hawash

Lead, BIM for Bridges and Structures Pooled Fund
Iowa DOT

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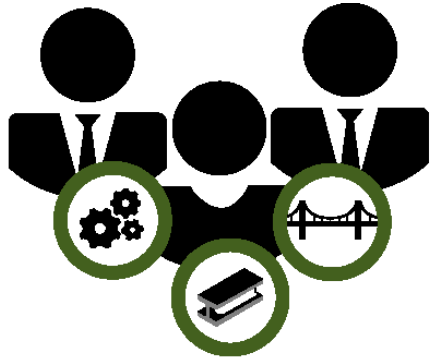
BIM for Bridges and Structures Pooled Fund Initiative

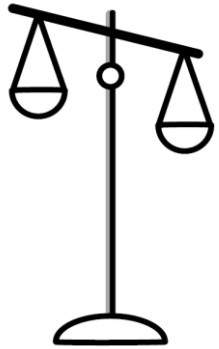
- National initiative to establish a software standard that will allow stakeholders in the US bridge industry to share 3D models and other data in an open, non-proprietary format
- Timeframe 2018-2023

INVESTIGATION & EXPLORATION

IFC DEVELOPMENT



SOFTWARE VENDOR ENGAGEMENT



ROI STUDY

EDUCATION & ENGAGEMENT

BIM FOR BRIDGES AND STRUCTURES TPF-5(372) ROADMAP

BACKGROUND

The desired outcome of the work under the TPF-5(372) Project is to establish a standard for bridge semantic and geometric information that is common in the United States, which is a continuation of a previous effort known as the IFC Bridge project to create international standards. The resulting products from the TPF-5(372) may be used by States as a baseline for future projects to further refine standards at the local level. The work under this project will be conducted in a series of activities in a five-year timeline to accomplish four major goals:

OUTCOME 1: Development of Information Delivery Manual (IDM)

OUTCOME 2: Creation of Model View Definitions (MVD)

OUTCOME 3: Development of Software Certification Materials

OUTCOME 4: Deployment of Stakeholder Training

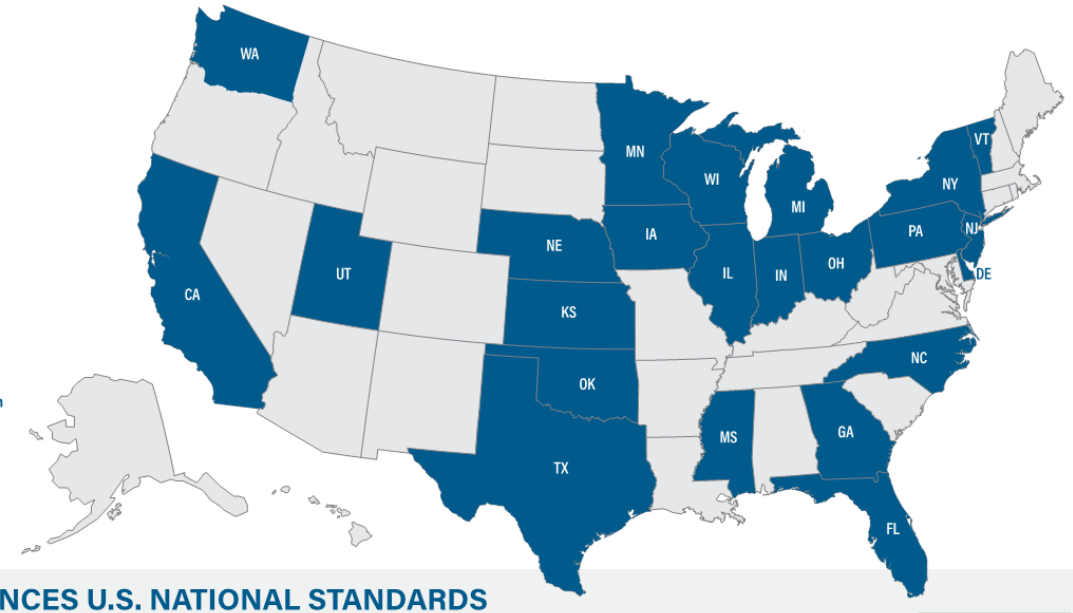
PROJECT SPONSORS

Total Commitments Received: $2,080,000.00*

*As of October 2020

https://www.pooledfund.org/Details/Study/624

https://www.bimforbridgesus.com

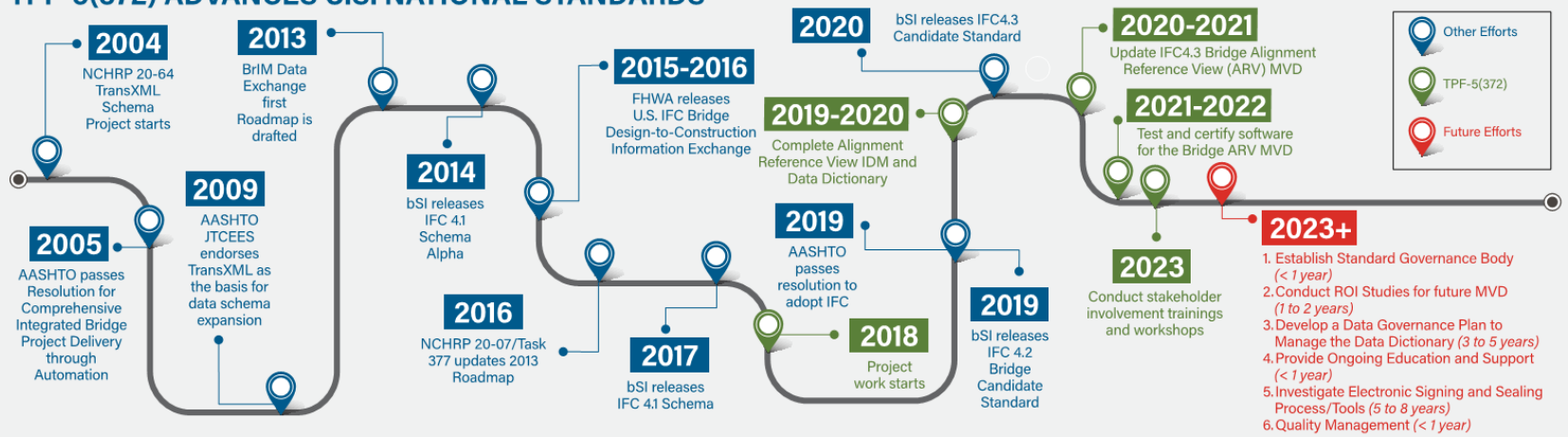


23 PARTICIPATING STATES PLUS FHWA*

Potential AASHTO Publications

- BIM for Bridges IDM
- BIM for Bridges MVD
- BIM Guide for MVD certification

TPF-5(372) ADVANCES U.S. NATIONAL STANDARDS



Key Activities to Create IDM

- Validate FHWA Bridge Lifecycle Process Map
- Develop IDM
- Evaluate current data dictionary
- Develop engagement plan

Key Activities to Create MVD

- Research common terms for bridge taxonomy for naming elements
- Evaluate proposed data structure and LOD requirements
- Generate exchange requirements

Key Activities to Test Software

- Create a software vendor engagement plan
- Create manuals and guidance documents to support software vendors in the initial certification process

Key Activities for Stakeholder Involvement

- Create product-specific BIM Guides on how to use the standards
- Conduct an ROI study
- Host seminars, conferences, and workshops to educate on the standards
- Develop a collaboration forum to gather feedback on standards

Year 1 | Year 2 | Year 3 | Year 4 | Year 5

2021 Goals

- Complete Information Delivery Manual (IDM)
- Complete Model View Definition (MVD)
- Coordinate with IFC4.3 Infra-Extensions Project
- Provide Software Vendors with testing materials
- Begin Return on Investment study

AASHTO 2022 Ballot Items

- Design to Construction IDM
- Design to Construction MVD

Questions & Answers

Will Sharp
Moderator
HDR

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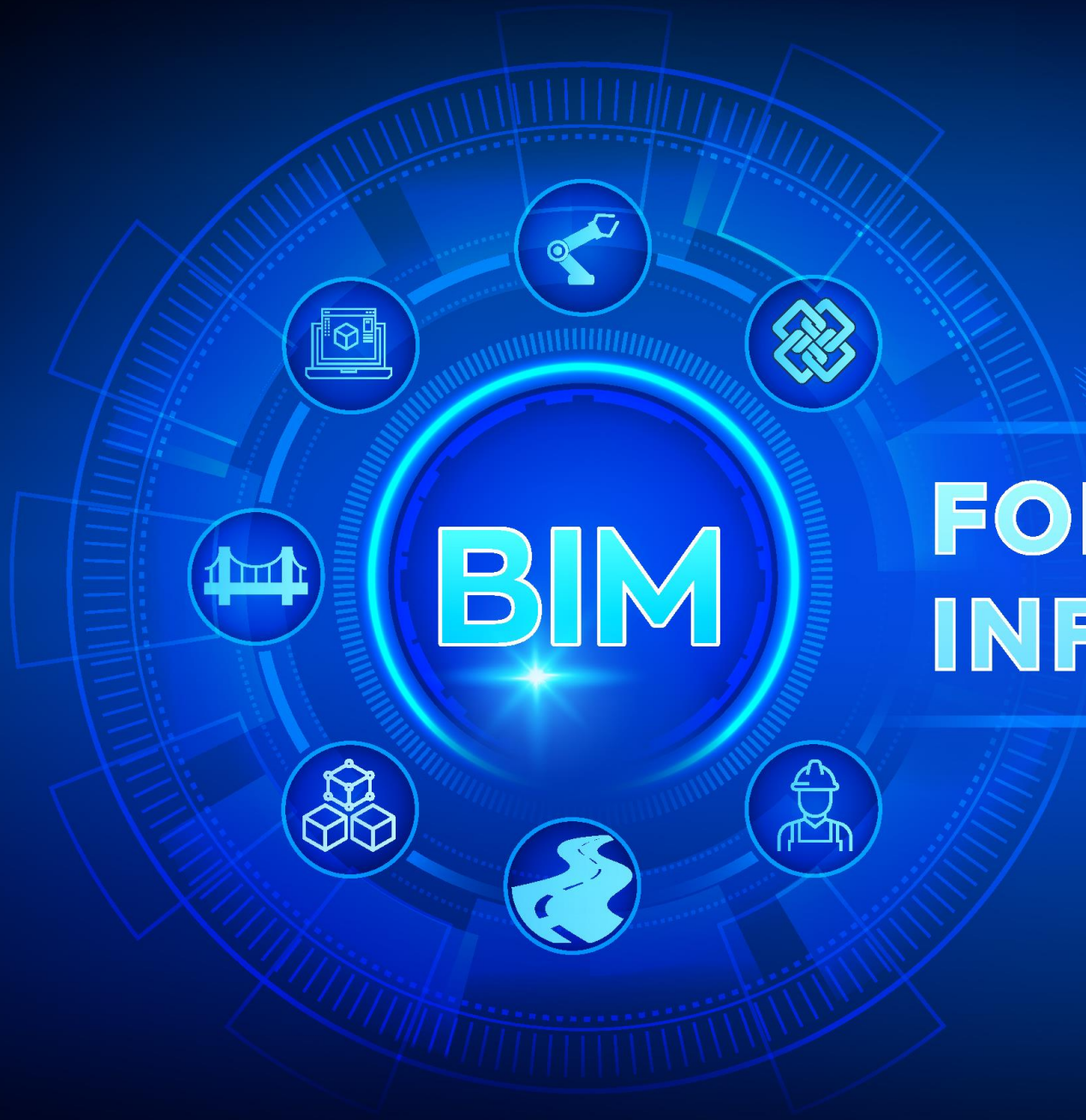

FOR INFRASTRUCTURE

Moving to Digital Delivery and Model as the Legal Document

State's Department of Transportation Perspective

INCLUDING:

- Overview of State DOT Pilot Projects
- Utah DOT Perspective
- Iowa DOT Perspective
- Florida DOT Perspective

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Introduction

George Lukes
Utah Department of Transportation

BIM FOR INFRASTRUCTURE

HIGHWAY ENGINEERING EXCHANGE PROGRAM

buildingSMART USA

TRB TRANSPORTATION RESEARCH BOARD OF THE NATIONAL ACADEMIES

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UDOT Keeping Utah Moving

Mentimeter: Are you doing Model Based Digital Delivery or Digital Construction?

a. Yes, we are doing this today
b. We are planning to do this within 2 years
c. Not sure
d. No, we have no plans to do this

Go to **www.menti.com** and use the code 8919 1465

Model as the Legal Document

How did we get here?

- Engineers Drafting => Professional Drafters
- 1st Generation CADD => CAD in paper format
- 2nd Generation CAD with .pdf delivery
- Contractors building models with plan sets => provided files
- EConstruction
- The beginning of the Data Revolution

DATA REVOLUTION AND MALD

Where are we going?

- Building a repeatable digital process from design to construction that replaces the traditional plan set and using the MALD
- Developing a digital as-built workflow
- And building a Digital Twin as a repository as the ultimate vision

BUT

Today is about using model based delivery in design and construction

DOTs ARE IN DIFFERENT STAGES

- Some states have awarded MALD: Iowa, NY, Fla, UDOT
- Some are on the cusp (or have awarded): PennDOT (Digital Delivery 2025), MI, OR and others
- Most know the MALD, Digital Delivery, BIM for Infrastructure and Digital Twin buzzwords and are exploring.
- In this track, you'll hear from UDOT, Iowa and Florida on their progress

OVERVIEW

State DOT Pilot Projects with Model as the Legal Document

- Projects Completed to Date
- Greatest Challenges / Lessons Learned
- Future Plans
- Agency Drivers for Model and the Legal Document

Mentimeter Results: Are you doing Model Based Digital Delivery or Digital Construction?

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c. Not sure
d. No, we have no plans to do this

Utah DOT Perspective

George Lukes

Utah Department of Transportation

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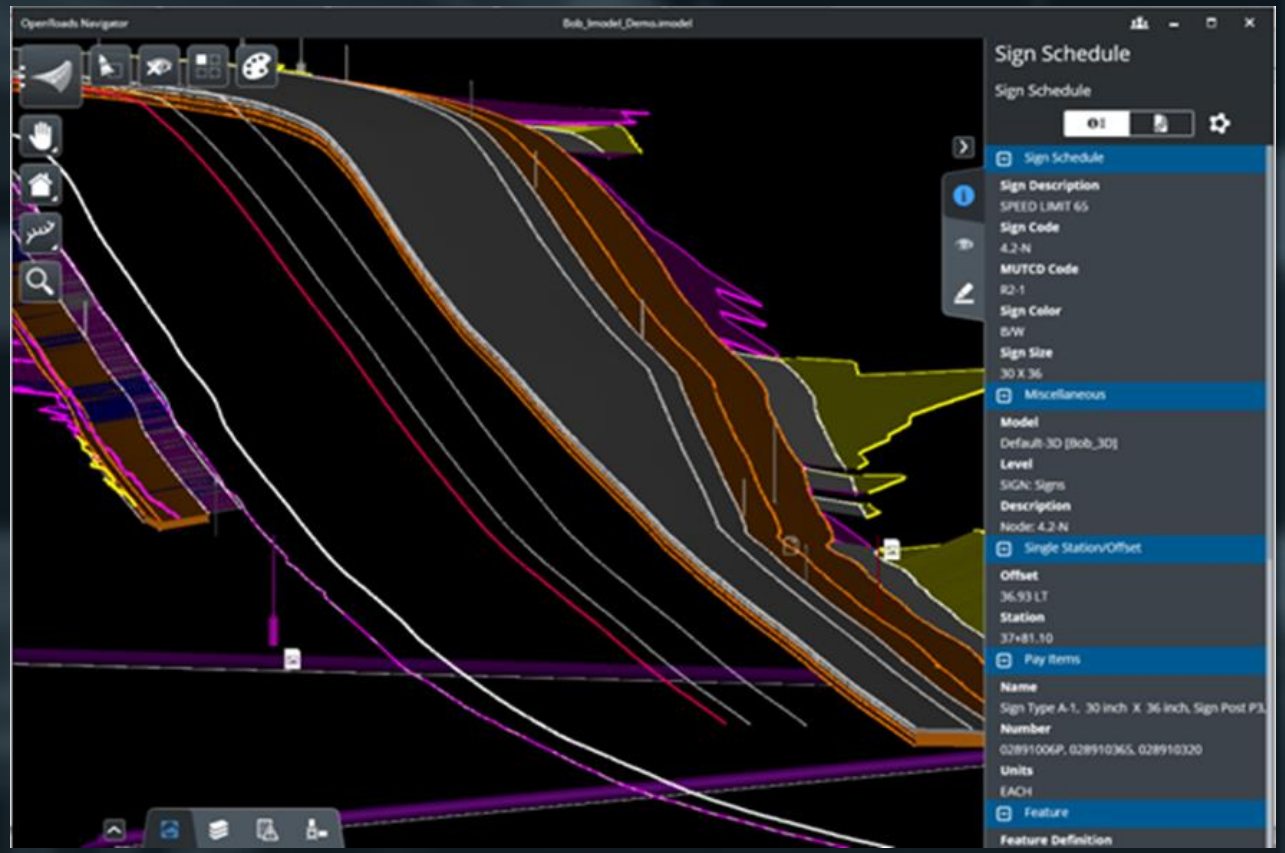
Evolution of BIM in Utah

IDC: Intelligent Design and Construction	MBDC: Model Based Design and Construction	Digital Delivery
Focused on using a 3D model to pass info to construction for use in Automated Machine Guidance (AMG) equipment without the translation from a 3D design model to 2D plan sheets into a 3D Construction model for AMG	Focused on using the design Model As the Legal Document (MALD) and reducing the number for plan sheets on projects	Using models and digital files to convey design intent for construction and capture digital data during construction to support asset management, planning and future project development “Digital Twin”

Model as the Legal Document (MALD) (Using Rovers/Mobile Devices in the Field)

- 14 MALD projects awarded (5 CMGC/9 DBB) all using rovers/mobile devices
- Nine fully constructed
- Seven awarded, <u>No Cutting Sheets</u>
  - Two fully constructed
  - Five in Construction
    - Includes one bridge



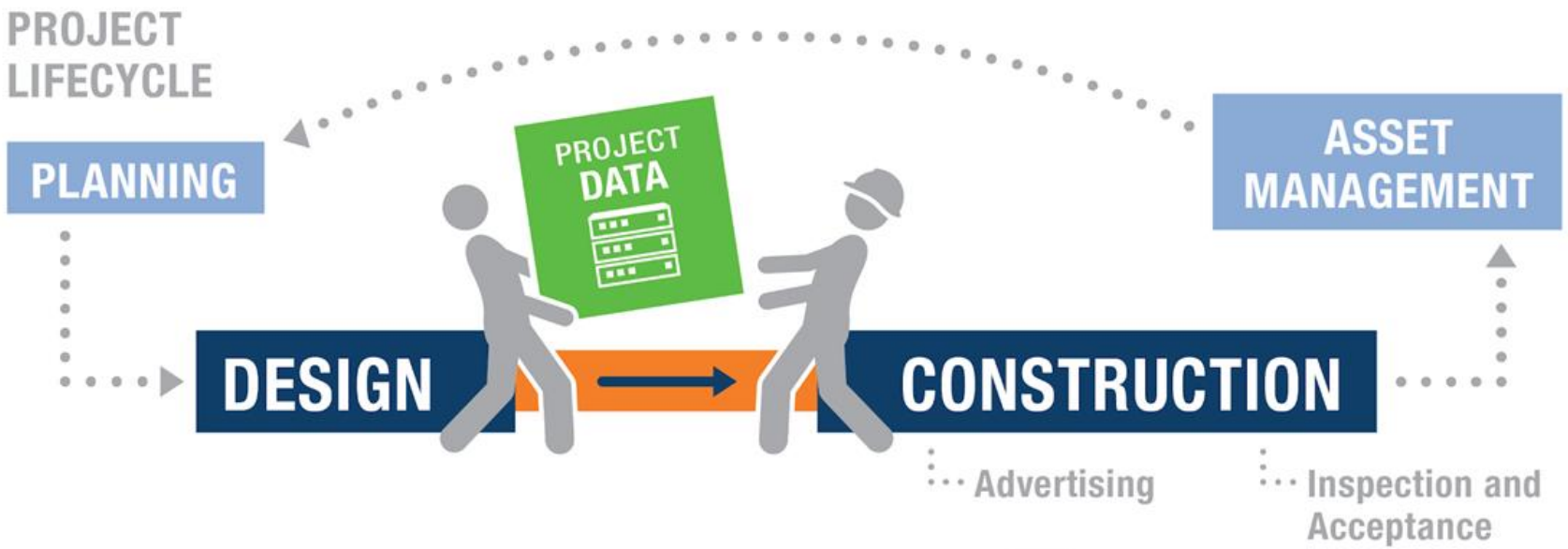
DIGITAL DELIVERY AID GRANT PROJECT

BUILDING A REPEATABLE PROCESS FROM DESIGN TO CONSTRUCTION

☑ Baseline workspace ☑ Naming conventions ☑ Links ☑ Attachments ☑ Standard attributes

BASELINE WORKSPACE FOR DESIGNERS

- PROJECT DATA
- CUSTOMIZED INTERFACE
- EXPANDED METADATA
- CONSISTENT DELIVERABLES
- UPDATED PROCESSES



BASELINE WORKSPACE

Using a baseline Workspace promotes adoption of new technologies, increases accountability for CADD standards, and produces consistent data.

METADATA

Additional data for these pilot elements will be tracked from Design to Asset Management:

☑ Signs ☑ Barrier
☑ Striping ☑ Guardrail

DATA TRANSFER

Data transfer from **DESIGN** to **CONSTRUCTION** can be streamlined through the use of a consistent workspace & supporting processes.

Learn more at
https://digitaldelivery.udot.utah.gov/

Lessons learned on pilot projects will be incorporated to enhance both the workspace and the process.

Partners and National Interest

- AID Grant: Large team of consultants & contractors
  - Kimley-Horn, Horrocks, HDR, Avenue, Lochner, Michael Baker, WW Clyde, Wadsworth
- DD of MBDC Committee: UDOT, Consultants and Contractors
- **Vendor Involvement: Bentley, Autodesk, Esri, Trimble, Bluebeam**
- Model Development Standards Manual (MDSM) and Research Report produced by HDR and Fair Cape Consulting
- EDC-6 Involvement/DABs workflow established

Resources for Repeatability

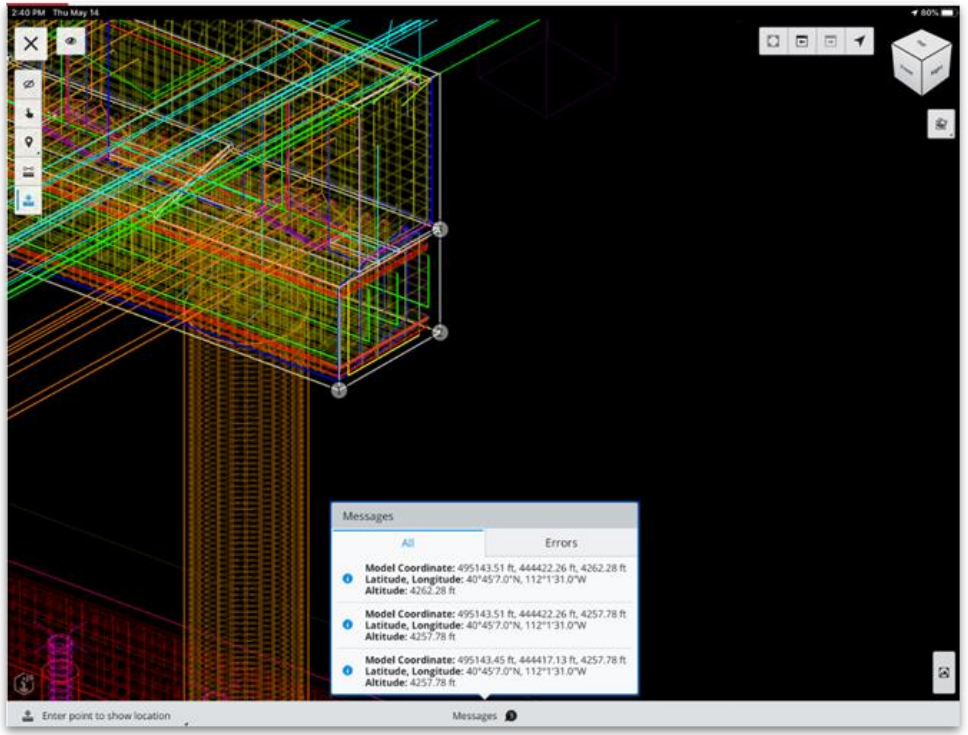
digitaldelivery.udot.utah.gov

Vision for the Future

CONSTRUCTION & REVIEW TOOLS:

Current Pilots

Bentley Synchro

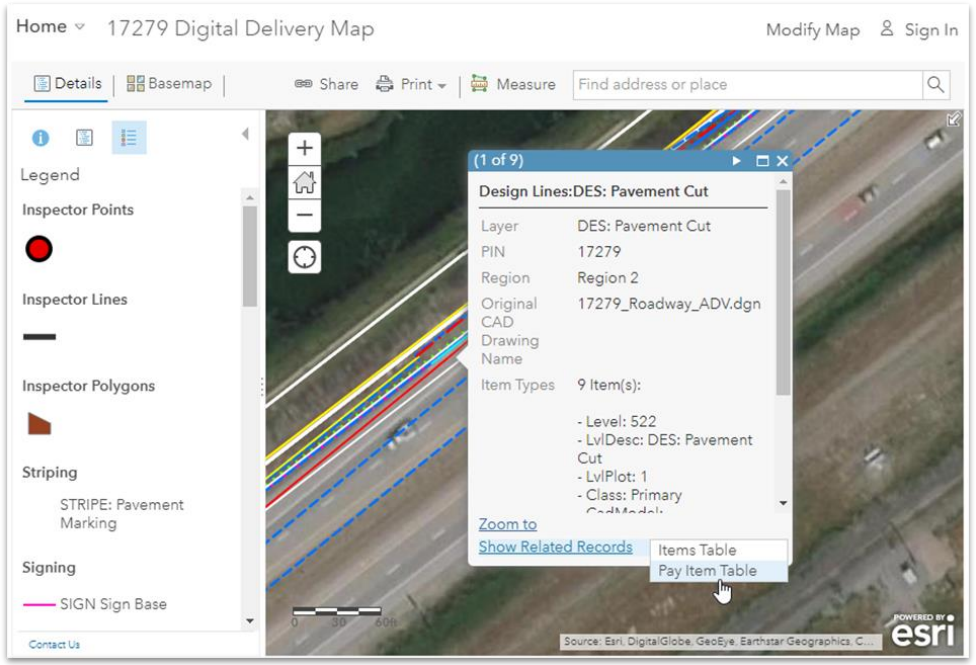


Bentley iTwin Review

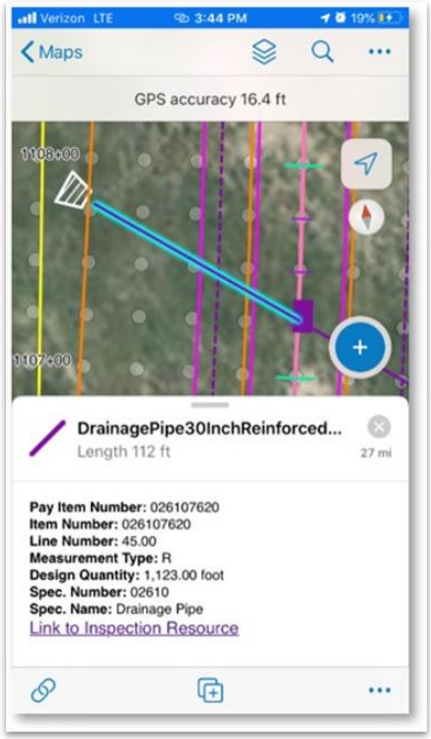
CONSTRUCTION & REVIEW TOOLS:

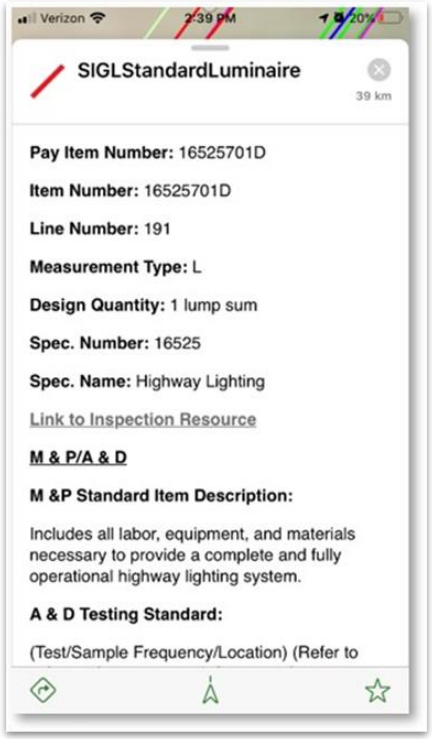
Current Pilots

Esri: Uplan



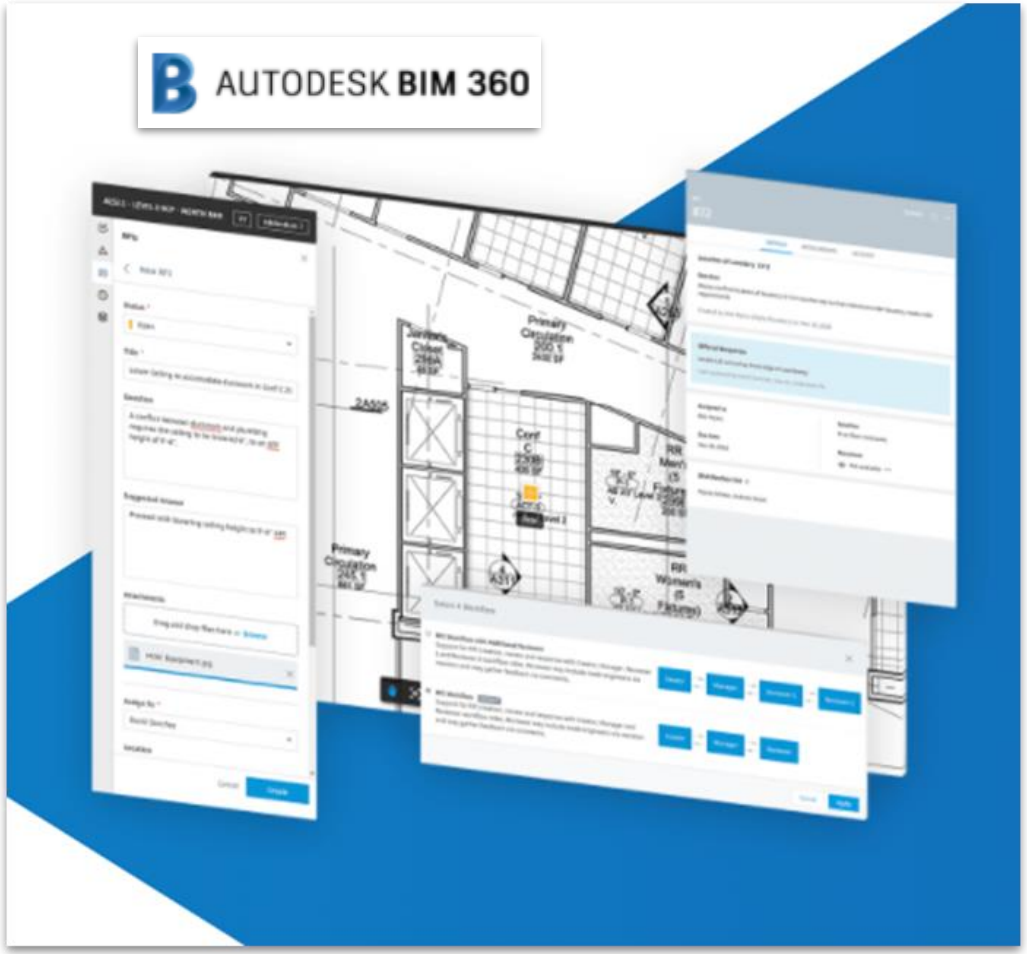
Esri: Collector





CONSTRUCTION & REVIEW TOOLS:

2021 Pilots



www.autodesk.com/bim-360

sitevision.trimble.com/urban-transporation-planning

CONSTRUCTION & REVIEW TOOLS:

Challenges

- Tools are still in their infancy, even at 2nd generation
- Do not meet all needs
  - 3D & Disconnected
  - Volume calculations
  - Data integration
- Crew are being asked to test multiple tools
- Cost and Licensing for new tools is unclear

FOR MORE INFORMATION:

digitaldelivery.UDOT.Utah.gov

UDOT
Keeping Utah Moving

Iowa DOT Perspective

Ahmad Abu-Hawash
Iowa Department of Transportation

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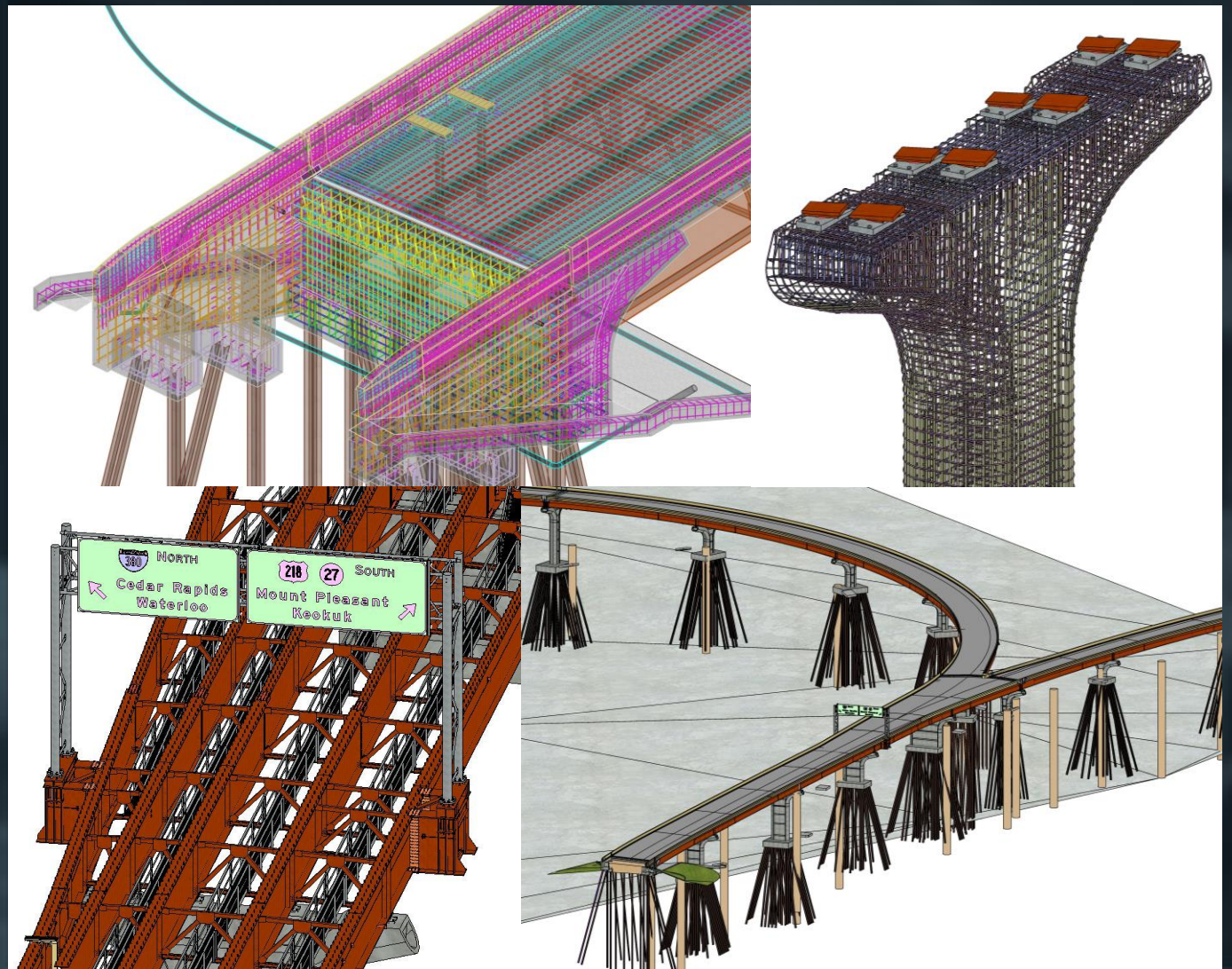
Iowa DOT Digital Delivery Experience - Roads

- 2006: Began to provide digital files to contractors for information only.
- 2015: Piloted our first project where the files were the controlling document on an 8-mile Grade and Pave project.
- 2016: Let 6 projects where the files were the controlling document, if the contractor elected to use AMG for either grading or paving.
- 2017: Added a supplemental specification to all in-house designed projects that indicated that if a contractor elected to use AMG that the files were the controlling document.

Iowa DOT Digital Delivery Experience – Bridge & Structures



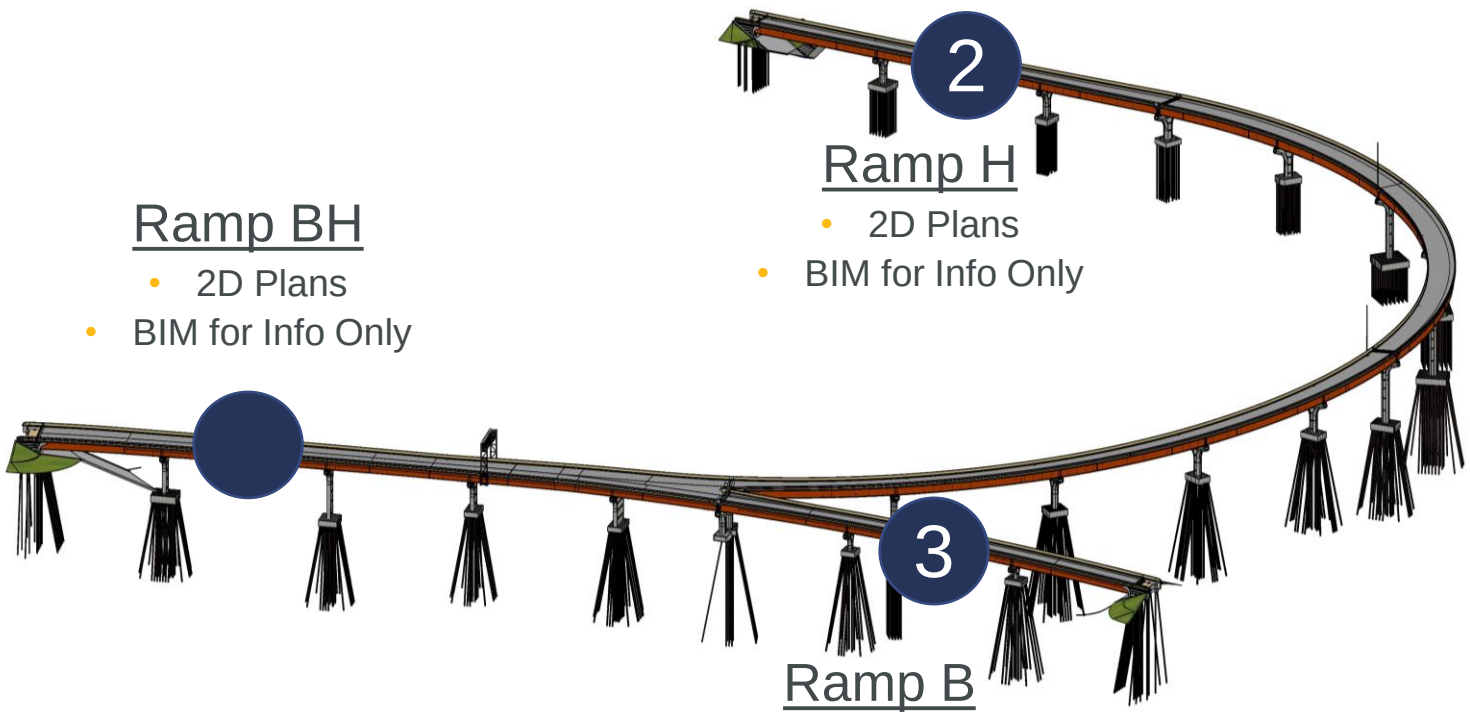
Model As Legal Document Pilot Project

- Development of BIM models for 3 curved steel plate girder bridges
- Part of the I-80/I-380 Interchange Reconstruction in eastern Iowa
- Over 4,200 ft of bridge modeled
- Model used as legal document

Project Goals

- BIM model as complete as possible
- Evaluate Bentley software
- Encourage contractor use

Iowa DOT BIM Pilot Project



Ramp BH
- 2D Plans
- BIM for Info Only

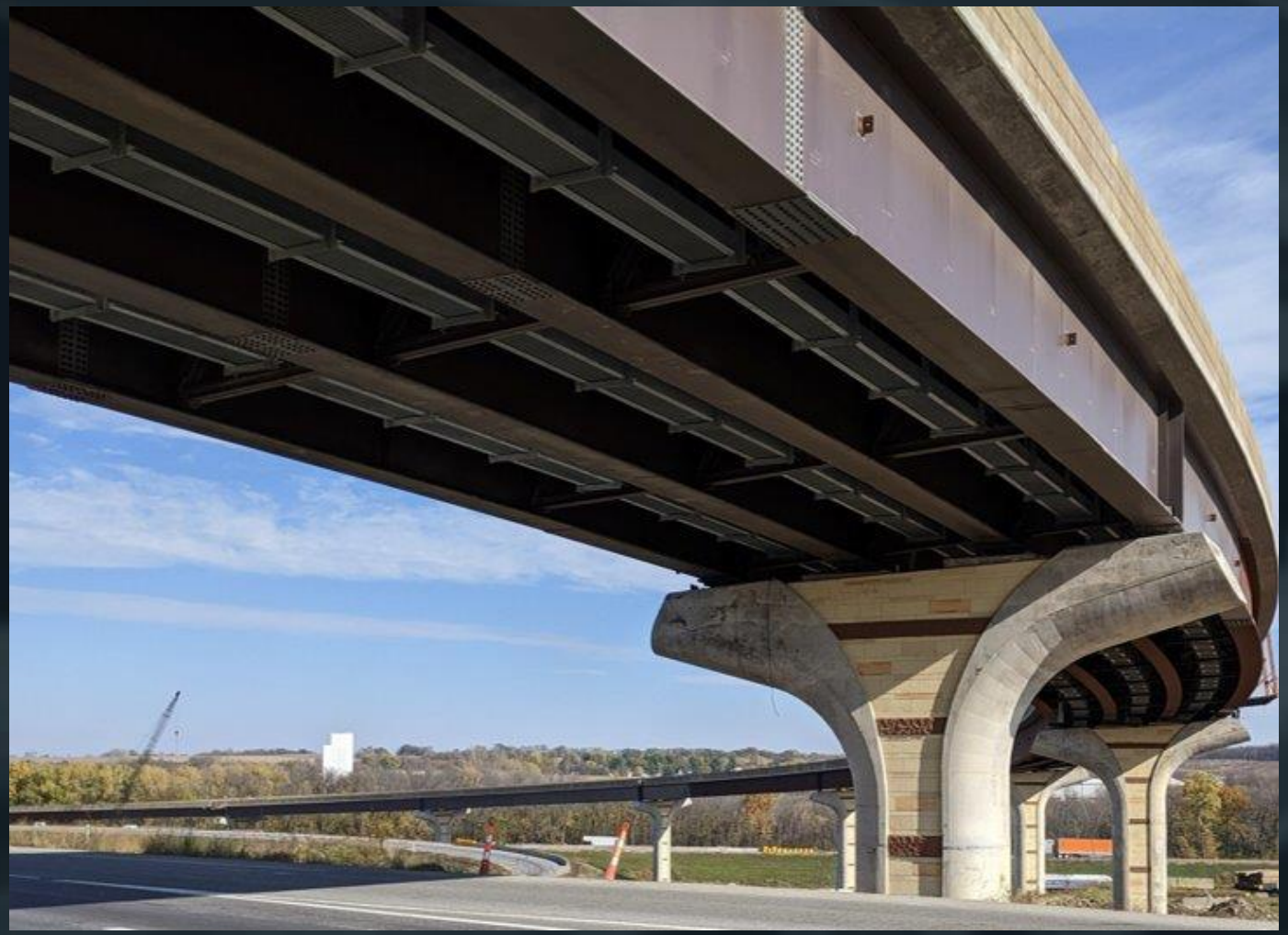
Ramp H
- 2D Plans
- BIM for Info Only

Ramp B
- BIM Deliverable

BIM Method of Delivery

- Combination of “For Information Only” and legal documents
- Satisfies goals of contractor engagement
- Use of BIM as the legal document encouraged by local contractors
- Signing and sealing of the model handled through special provision
- Design/Bid/Build project
- Designer-led training sessions before advertisement period

Lessons Learned



- Model was used repeatedly for visualization
- Significant software limitations
- Contractor’s limited experience and capability using BIM
- Buy-in from senior field staff

Iowa DOT Future Work

- Digital as-built models for asset management
- More infrastructure projects (roads and bridges) delivered using digital models
- Require 3D models on new or replacement structure projects
- Establish BIM Model Development Standards Manual
- Internal collaboration across functional lines
- Finalize strategic plan/roadmap for digital delivery

Florida DOT Perspective

Vern Danforth

Florida Department of Transportation

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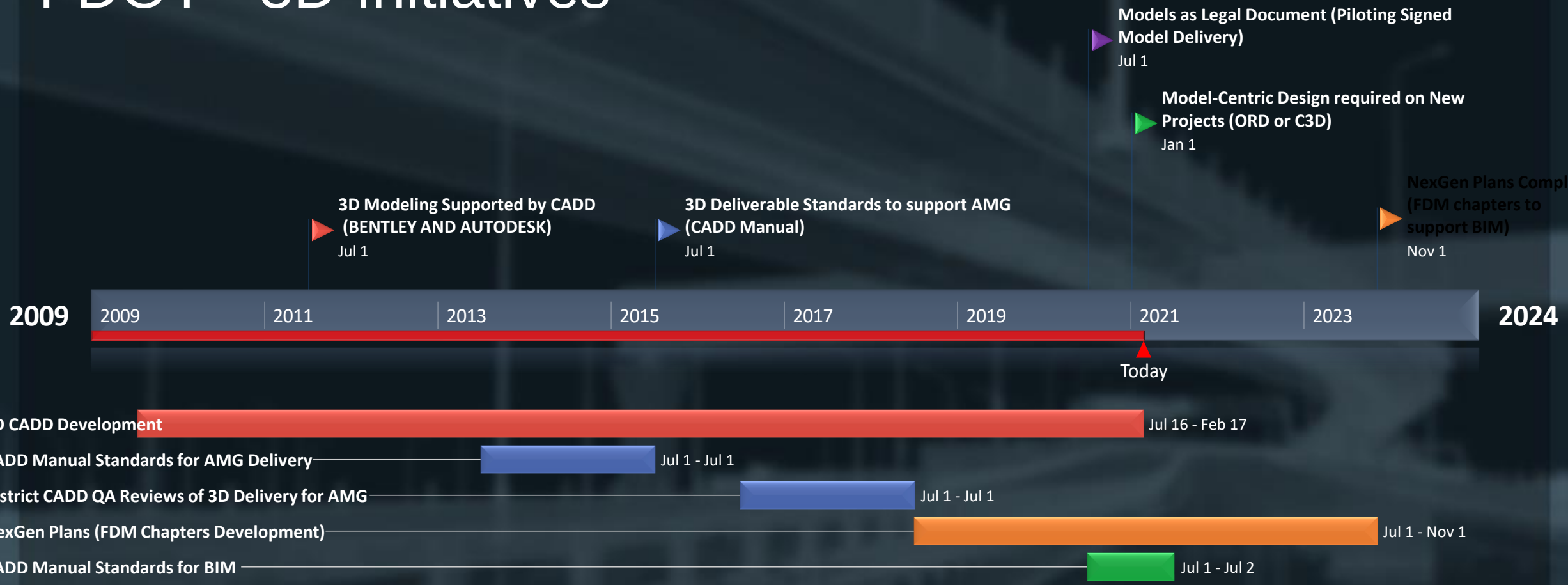
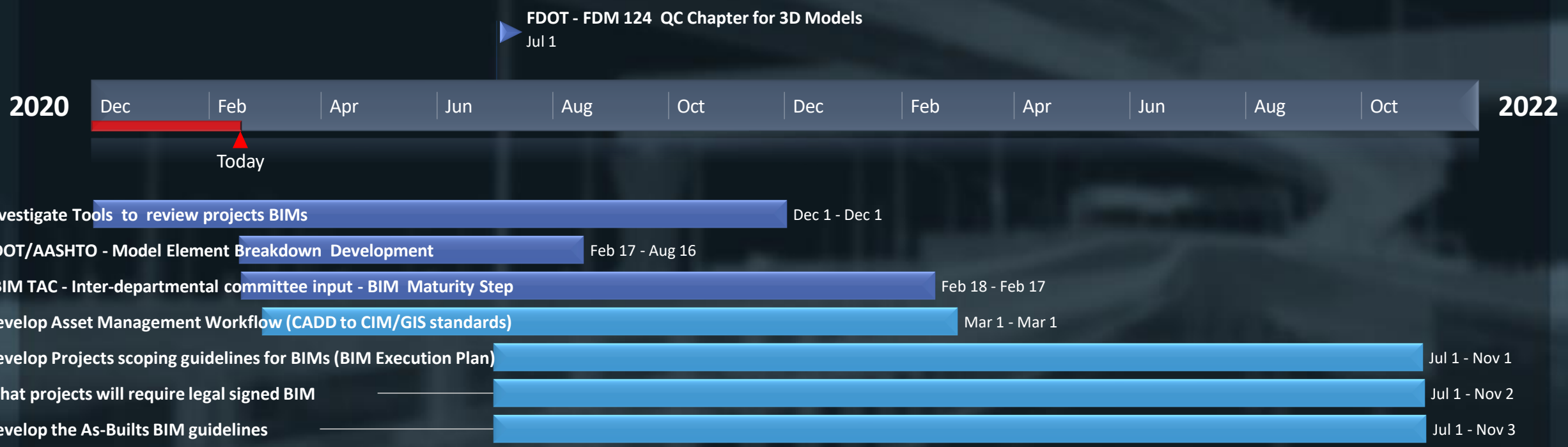
FDOT: Transitioning to BIM delivery
...it's a long walk!

FDOT - 3D Initiatives



Current/Future Work



FDOT Industry representation

- AASHTO JTC EEDS
- TRB Research Panels, BIM ROI Expert Panel Study
- HEEP BIM Special Interest Group, Building SMART US
- FHWA Pooled Fund, BIM for Bridges, Infrastructure
- FHWA EDC6 Digital As-Built and the Constructible Model workflow
- NCHRP – Guidebook for Data and Information Systems for Transportation Asset Management 08-115
- AASHTO TAMP
- FHWA GIS in Transportation https://www.gis.fhwa.dot.gov/default.asp

Communicating the direction

Training

- FDOT CADD Training annually on 3D since 2011
- FLUG has provided training since 2012
- ACEC engaged to provide consultant training in 2021

On-going Discussions

- DDE, DCPME monthly meetings
- FICE/ACEC Presentations since 2018
- Discipline specific TAC meetings

Training in other Areas

Inter-departmental **BIM Technical Advisors** Committee

- Determine BIM delivery on Projects
  - Use Case Benefits And Return On Investment
  - When should we require signed models
  - Projects scoping BIM
- Final Plans Reviews
  - Project 3D Model Reviews BIM
- Building from BIM: CEI Contracts
  - Project 3D Model Reviews BIM
  - Advanced Modelers and Survey needs
  - Modified Special Provision and/or Standards
- As-Builts BIM? Construction/CEI Contracts
  - Project 3D Model Reviews BIM
- Maintenance and Operation Access/Needs
  - Project 3D Model Reviews BIM
  - Data sharing: CADD to GIS standards

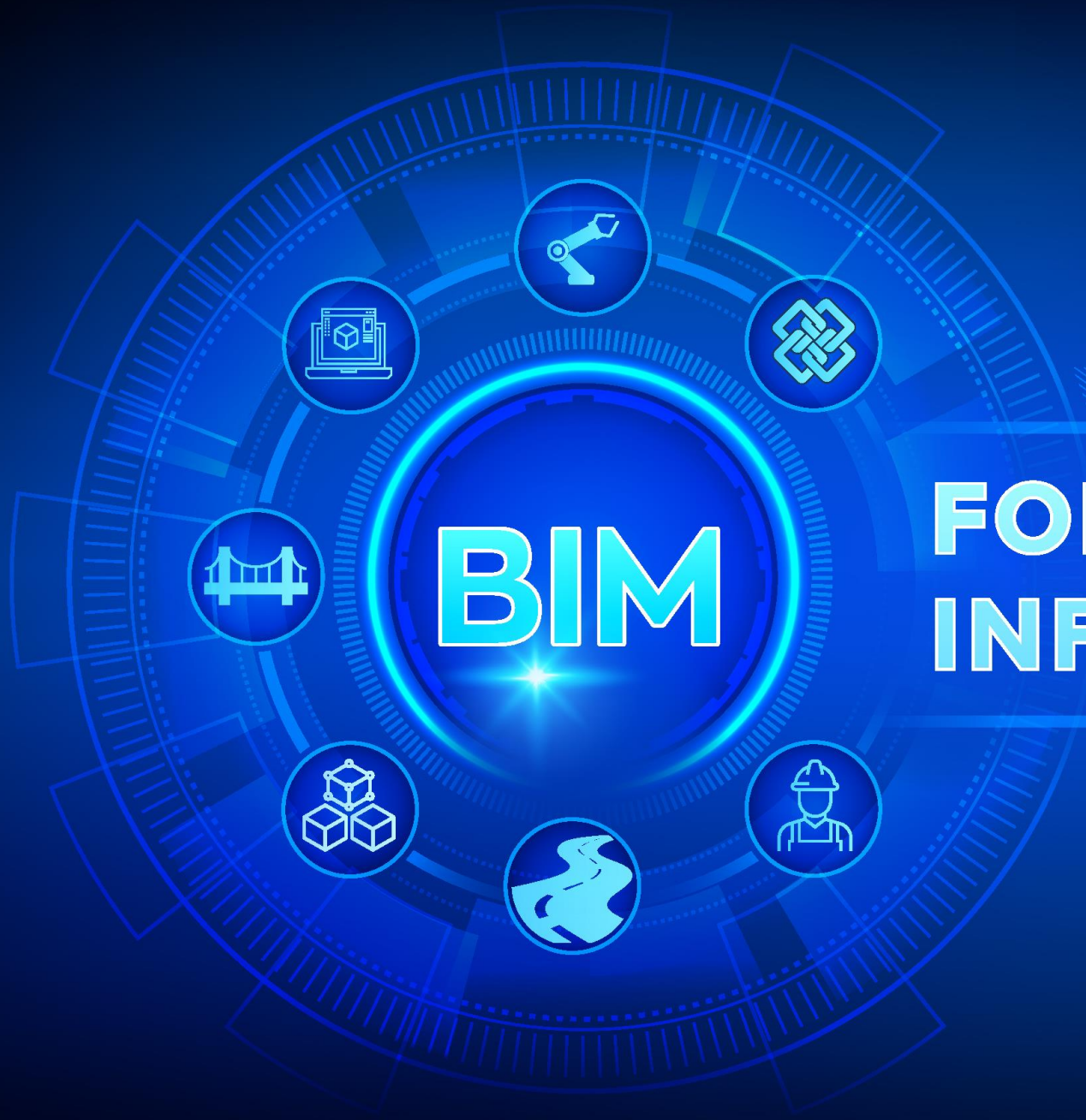
Training in other Areas

Inter-departmental **BIM Technical Advisors** Committee

- Determine BIM delivery on Projects – District Project Managers
  - Use Case Benefits And Return On Investment
  - When should we require signed models
  - Projects scoping BIM
- Final Plans Reviews – Program Management Office
  - Project 3D Model Reviews BIM
- Building from BIM: CEI Contracts – District Construction Offices
  - Project 3D Model Reviews BIM
  - Advanced Modelers and Survey needs
  - Modified Special Provision and/or Standards
- As-Builts BIM? Construction/CEI Contracts – Final Estimates
  - Project 3D Model Reviews BIM
- Maintenance and Operation Access/Needs – Maintenance Office
  - Project 3D Model Reviews BIM
  - Data sharing: CADD to GIS standards –Coordinating with CIM Office

Questions & Answers

Sandra Larson
Moderator
Stanley Consultants



FOR INFRASTRUCTURE

Using Model-Based Digital Delivery in Construction

Contractor Panel Discussion

INCLUDING:

- Introduction
- Contractor Panel Discussion

AED80(1)

Introduction

Facilitators:

George Lukes
Utah Department of Transportation

Alexa Mitchell
HDR

AED80(1)

Mentimeter:
What is your experience with the Model as the Legal Document?

CONTRACTOR:

a. No experience or plans to do
b. Some experience
c. No experience, but planning to do in the next 2 years
g. Not sure

DESIGNER/AGENCY:

d. No experience or plans to do
e. Some experience
f. No experience, but planning to do in the next 2 years
g. Not sure

Go to **www.menti.com** and use the code 8919 1465

Contractor Panel Discussion

Rachelle VanDeventer
Michigan Infrastructure & Transportation Association

Logan Whitehead
Ralph L. Wadsworth Construction

Matt Blake
Lane Construction

Greg Domermuth
Harrison & Burrowes Bridge Constructors

- **Topics of Discussion**
  - What is your experience with model-based delivery?
  - What is your vision for model-based delivery to be successful?
  - How do you see things changing for you when a model is delivered as the legal document?
  - What advice do you have for highway owners and designers regarding models as legal documents?

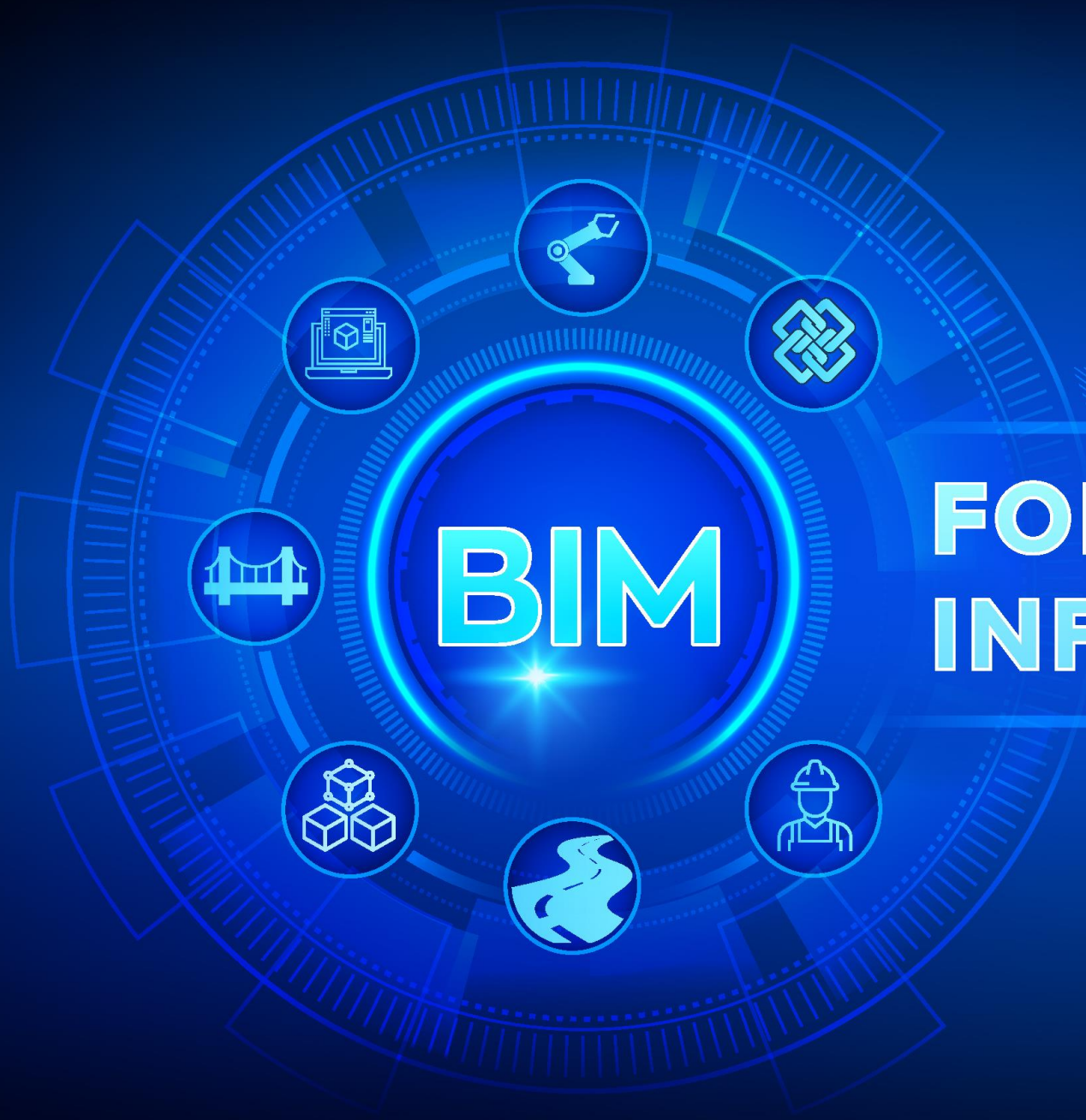
Mentimeter Results:
What is your experience with the Model as the Legal Document?

CONTRACTOR:

a. No experience or plans to do
b. Some experience
c. No experience, but planning to do in the next 2 years
g. Not sure

DESIGNER/AGENCY:

d. No experience or plans to do
e. Some experience
f. No experience, but planning to do in the next 2 years
g. Not sure



FOR INFRASTRUCTURE

Using Model Based Delivery in Design & Construction

Wrap-Up

INCLUDING:

- Input on Future Topics
- Future Events and Activities
- IHEEP
- Workshop Feedback and Conclusion

AED80(1)

Input on Future Topics

Elaine Richard
Connecticut Department of Transportation

Input on Future Topics

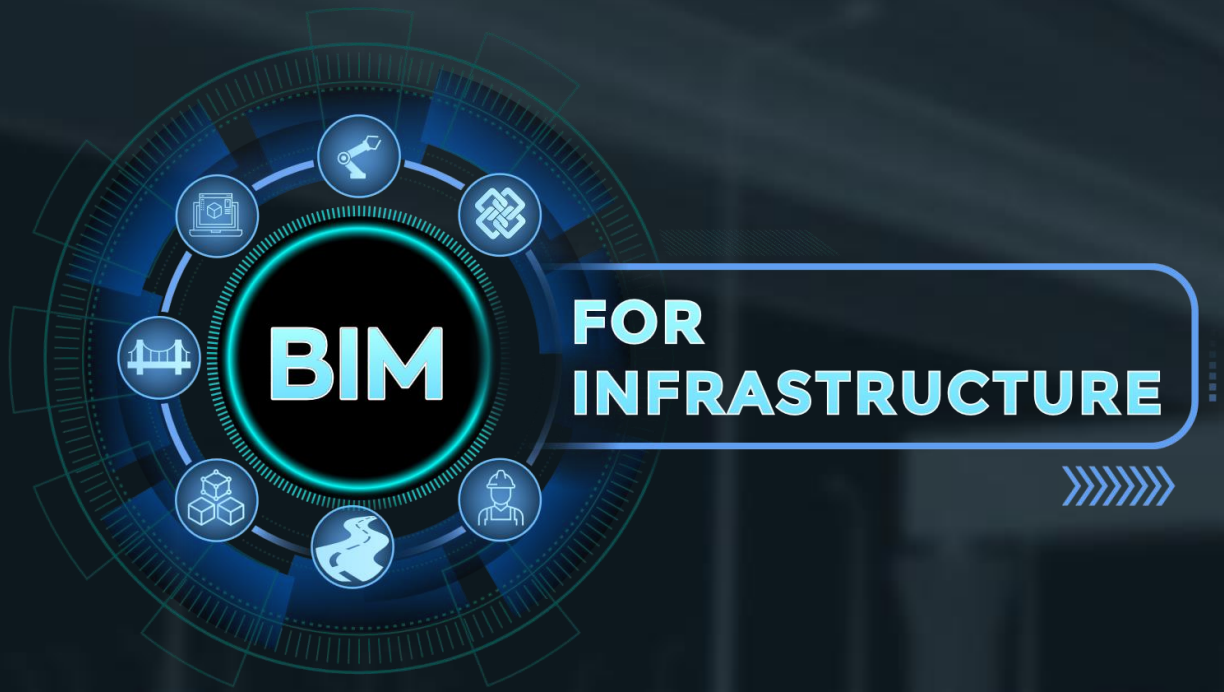
- Thank you for submitting questions
  - Some of your questions were answered by the presenters and panelists today
  - Remaining unanswered questions received will be combined and send to the panelists
  - A FAQ sheet will be shared with registered participants at a later time
- We'd love to hear from you via a post-webinar survey
  - Potential topics for future webinars and workshops
  - Preferred ways for communication and collaboration related to BIM for Infrastructure

Future Events

Elaine Richard
Connecticut Department of Transportation

AED80(1)

Future Events



- Quarterly Events Planned
- Next Webinar / Workshop - June
- All registered participants will receive an invitation for future events

Future Events

- IHEEP 2021 Annual Meeting – November 30 - December 2, 2021

- buildingSMART Virtual Summit – March 15-26, 2021

- Annual Transportation Research Board Meeting – January 2022

AASHTO Committee on Design

- Committee on Design Meeting – July 19-23, 2021

IHEEP

BIM FOR INFRASTRUCTURE

Elaine Richard

Connecticut Department of Transportation

HIGHWAY ENGINEERING EXCHANGE PROGRAM

buildingSMART USA

TRB TRANSPORTATION RESEARCH BOARD OF THE NATIONAL ACADEMIES

AED80(1)

CONNECTICUT DEPARTMENT OF TRANSPORTATION

What is the International Conference (IHEEP)?

- A conference held each year
- Hosted by the rotating State Transportation Agencies
- Offers:
  - Technical presentation sessions
  - Roundtables
  - Panel discussions
  - Keynote speakers
  - Social events
  - Exhibitor’s hall with vender/sponsor booths

Why IHEEP

Conference Focus Areas:

- BIM for Infrastructure
- 3D Modeling
- Design/Construction Integration
- Digital Project Delivery
- Model Based Project Delivery
- Digital Twins
- E-Construction Initiatives
- Data/Document Management
- Data Governance
- GIS Transportation Solutions
- Asset Management
- Managing changing software environment
- UAV/Drone Use
- Augmented and Virtual Reality

IHEEP 2021 CONFERENCE UPDATE

Target Date: November 30 – December 2
Hosted by Connecticut DOT

Type T.B.D.

In-person??? Virtual??? Hybrid???

For more information visit WWW.IHEEP2021.COM

Workshop Feedback

Elaine Richard
Connecticut Department of Transportation

AED80(1)

Mentimeter: Webinar Evaluation

a. The session delivered the information I expected.
b. The subject matter was presented effectively.
c. The webinar duration was appropriate for the content.
d. The content was applicable to my work.

Go to **www.menti.com** and use the code 8919 1465

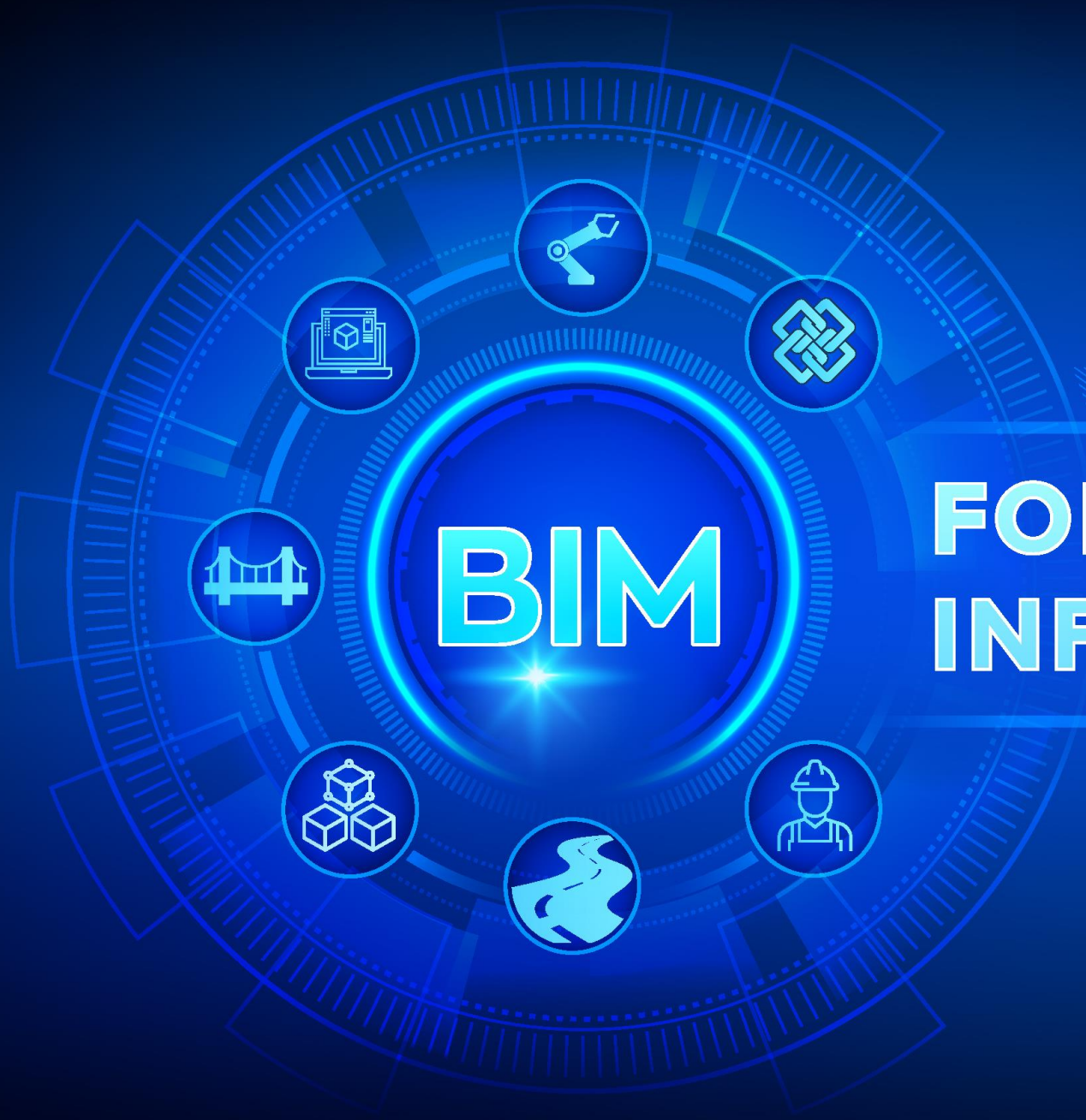
Thank You!

For questions please contact:

- TRB AED80(1) – BIM for Infrastructure Sub-Committee - www.trbviz.org
  Co-Chair - Lance Parve lance.parve@wsp.com

- buildingSMART USA - www.buildingSMARTusa.org
  US Representative - Ian Howell Ian.Howell@buildingSMART.org

- HEEP - www.heep.org
  President - Elaine Richard elaine.richard@ct.gov
  Vice President - Vern Danforth, P.E. vern.danforth@dot.state.fl.us
  Secretary - George C. Lukes glukes@utah.gov



FOR INFRASTRUCTURE