

Today's Presentation

- The Big Picture –BIM (for Infrastructure)
- The Federal/FHWA Role
- Resources

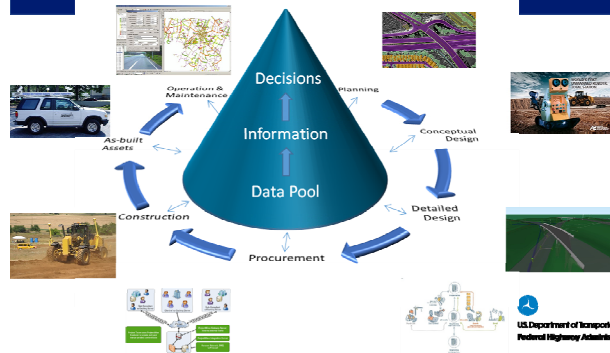


BIM is a transformative approach to digital program and project delivery – e-Everything

Source: <https://www.channelpartnersonline.com/2019/04/11/todays-channel-the-big-picture/>

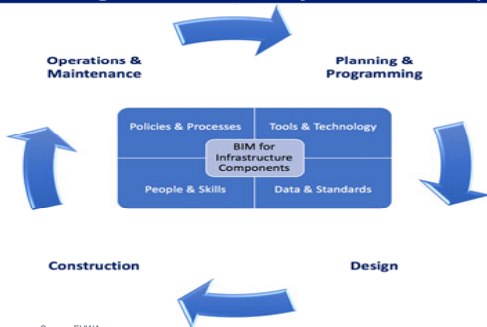
BIM for Infrastructure is a collaborative work method for structuring, managing, and using digital data and information about transportation assets throughout their lifecycle.

BIM for Infrastructure (old term Civil Integrated Management or CIM)



Source: Dr. David Jeong, Iowa State University, Presentation August 17, 2016

Profound Changes for Program and Project Delivery



Source: FHWA

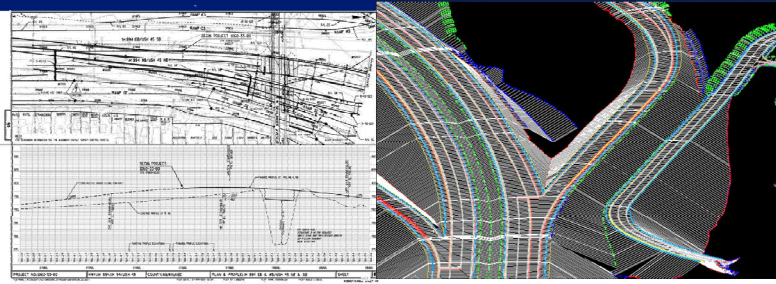
Federal/FHWA Role

MAP-21 – 23 USC 106 (j) Use of Advanced Modeling Technologies

- ... the Secretary shall **encourage the use of advanced modeling technologies during environmental, planning, financial management, design, simulation, and construction processes of the projects.**
- ... **compile information/best practices ... disseminate ... and promote use**
- ... **develop and publish on the public website ... a detailed and comprehensive plan for the implementation ...**



EDC 2 - 3D Engineered Models for Construction



Moving from Analog to Digital 3D Models

Images: Wisconsin DOT



EDC 3 – 3/4/5D Engineered Models & Post-Construction

- As-found Survey Data (e.g., Lidar for Asset Management)
- Schedule (4D) and Cost (5D) Modeling
- Post-construction Survey Data (as built including utilities)



Image: Wisconsin DOT



EDC 3 & 4 - e-Construction

- Electronically capturing construction data
- Electronic submission of all construction documentation
- Increased use of mobile devices
- Increased automation of document review & approval
- Use of electronic signatures by all parties throughout process
- Secure document and workflow management accessible to all stakeholders on any device

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FHWA national 'BIM roadmap' under construction

- Contract to produce BIM implementation roadmap and refine 'What BIM is for Transportation'
- Build on EDC and industry efforts
- International efforts
- FedBIM
- IHEEP focus group in September

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Vision, Goal & Objective (DRAFT)

VISION

Transform the way we deliver infrastructure projects – Digitalize the nation's infrastructure project throughout the asset lifecycle (from design to construction to operations to asset management and maintenance)

GOAL

The States adopt BIM for Infrastructure as standard practice

OBJECTIVE

The States implement a set of roadmap activities to achieve a progressively higher degree of BIM maturity over time.

...directly supports FHWA FY 2019-2022 Strategic Plan Infrastructure & Innovation Goals

FHWA's BIM-Enabling Research

Contact Katherine Petros (FHWA)
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FHWA BIM-Enabling Research

- Utilizing 3D Digital Design Data in Highway Construction – Case Studies
- Automation in Highway Construction
- Return on Investment for Paperless Project Delivery (e-Construction)
- Effective Use of Geospatial Tools in Highway Construction
- Determination of Improved Pavement Ride Quality when Utilizing 3D Modeling and Automatic Machine Guidance



FHWA BIM Research

- Integrating 3D Digital Models and other Building Information Management Data into Asset Management
- Construction Inspection for Digital Project Delivery
- Identifying Data Frameworks and Governance for Establishing Future BIM for Infrastructure Standards
- Establishing common exchange language/schema for bridges
- Considering BuildingSmart Industry Foundation Classes (IFC)
- Ongoing work to 'translate' NBI data to 3D models



Ongoing: Unmanned Aerial Systems (UAS): Bridge Inspection - Data Quality and Handling

Brief Scope: *Document effective use of UAS in bridge inspection and best practices for how the collected data should be assessed, presented, and stored to provide reliable and actionable information to owners.*

Project Schedule: *Awarded February 2018*

Project Status: *20 month project.*

Key Engagement Opportunities: *Agency participation in upcoming interviews*

Key Deliverables To Date: *None*



Source: FHWA TFHRC



Ongoing: Leveraging Augmented Reality (AR) for Highway Construction

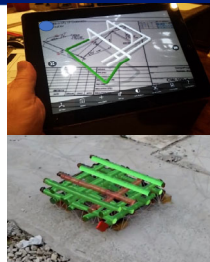
Brief Scope : *Investigate the availability, accessibility, and reliability of using AR for construction inspection and review, QA, training, and improved project management. Document potential advantages, limitations and cost of using AR.*

Project Schedule: *November 2018 completion*

Project Status: *On-going. Completed Market Review.*

Key Engagement Opportunities: *Augmented Reality in Highway Construction Workshop (held May 9, 2018) & Webinar in November 2018*

Key Deliverables To Date: *None*



Source: FHWA TFHRC



Resources



Available FHWA Innovation Deployment Funding

- Accelerated Innovation Deployment (AID) Funding
 - Up to \$1M per award
 - Project initiates within 6 mo
 - <http://www.fhwa.dot.gov/accelerating/grants/index.cfm>
- State Transportation Innovation Council (STIC) Incentive Funds
 - Up to \$100,000 per year
 - contact your FHWA state office
 - <https://www.fhwa.dot.gov/innovation/stic/guidance.cfm>
- MAP-21 Section 1304 Innovative Project Delivery Funding
 - Up to 5% increased federal share
 - <http://www.fhwa.dot.gov/map21/qandas/qaidp.cfm>



EDC3 'How to' Guidance Briefs

- Lidar data collection and management
- Standards based data collection and exchange based on business requirements
- Updating or maintaining 4D models as schedules evolve
- Project selection guidance for 4D modeling by usage case
- Guide specifications for capturing digital as-builts for subsurface utilities.
- Dealing with legacy survey data in the design, construction, and asset management phases
- Framework for digital asset management
- Estimating return-on-investment for technology implementation at the project and program level



Multi-Product Description
www.fhwa.dot.gov/innovation

www.fhwa.dot.gov/innovation
www.fhwa.dot.gov/innovation