Bridge Information Modeling (BrIM): Evolving into a Model Based Industry An Owners Perspective

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Presentation Outline

• The Vertical Industry / Oil Industry – Leading the Way
• Benefits of Bridge Information Modeling to AASHTO SCOBS
• Other Transportation Infrastructure Information Model Initiatives
• T-19 “Software and Technology” Efforts
Information Modeling
BIM Terminology and Usage

3D
- Portfolio Management
- Facilities Management
- GIS Integration

4D
- Scheduling
- Simulation
- Structure

5D
- Cost Estimation

6D
- Energy & Analysis tools
Life Cycle of Structures Information Model

- Planning / Concepts / Scenarios
- Bridge Management
- Information Model
- Operations
- Construction
- Design

Touch Points to Cross Functional Areas
Systems Interface
Model Deliverables
Planning / Scenarios

• Visualizations
• Simulations – Rehab vs. replacement
• Bridge Management Scenarios
• Investment Strategies
• Model Creation
Visualizations
Design

• Visualizations
• Import / export into FEM
• Virtual Construction
• Data Model Creation
• Integration into Refined Analysis
• Fabrication
• Interference – Clash Detection
• Model Handoff
Clash Detection - Micro
Clash Detection Macro
Refined Pier Connection Model
Interference
(Tower – Crossbeam – Column Connection)
Integration into Refined Analysis
Construction

- Schedule
- Sequencing
- Demolition Planning
- Virtual Fit Up
- Bill of Materials Supplied
- Fabrication
- As built Conditions
- Model Handoff
Construction Schedule and Sequence
Operate

- Oversize Over Weight Permits
- Perform Rating and Posting analysis
- In Service Investigations
- Emergency Simulations
- Operations Real time Monitoring
  - Videos, gates, loads etc
In Service Investigations
Bridge Management, Preservation, and Maintenance

• Attach Information from / to Inspection Reports
• Bridge Management
• Cyclic Maintenance – Workflow
• In Service built Conditions
CIM 3D Modeling: Zoo Interchange
Design-grade/Post-construction Surveys

Georeferenced Hi-res Digital Images
3D XYZ Return LAS Point Clouds
2D - 3D Feature Lines
3D DTM - TINs X-Sections
3D CIM - BIM DSMs

4/14/2015 Iowa 3d Structures Workshop
Other Transportation Infrastructure Information Model Initiatives

• Civil Integrated Management (CIM)
• E-Delivery
  – Automated Machine Guidance
  – Stingless Pavers
  – Models in the field for construction
• Paperless Construction
What is T-19 doing?

• Educating SCOBS members on Information Modeling
• Working with Cross AASHTO and TRB committees
• Participating with FHWA in their Information Modeling efforts
• Resourcing a 20-07 to have workshop and provide road map of next steps for a standardized format
Up Coming Events

• Today’s Event

• April 20 AASHTO Subcommittee on Bridges and Structures (SCOBS) – Presentation to State Bridge Engineers
Up Coming Events

• June 11 International Bridge Conference (IBC) FHWA Workshop

• ??? National Workshop on a road map to a Standardized Bridge Information Model
What Can We Do to Foster Change?

• Get Involved
  – Participate at Events
  – Champion Change

• Require Models as deliverables for owning and operating facility

• Partner with Contracting Industry to transform industry construction of structures
  – Fabrication – early Win