Moving towards Civil Integrated Management (CIM) – The Future of 3D Bridge Design at NYSDOT

AASHTO Bridge Meeting
T-19 Software and Technology Committee
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2 Objective

• Provide an overview of NYSDOT expansion of 3D Bridge Design.

• Demonstrate the need for the open source Standard data model format provided by Trans-XML.
What’s next for Model Driven Bridge Design

• 3D Bar Reinforcement.
• Model Based Contacting.
• Automated Modeling Applications.
• Fabrication, and Virtual assembly of Steel
• Civil Integrated Management
Automated Modeling Tools

- CADD tools that lets designers develop 3D models based on parametric inputs of bridge geometry.
Automated modeling of a pier based on NYSDOT BrIM. Parametric inputs tie geometry back to project fundamentals such as roadway alignment and vertical horizontal and alignment
Eliminate Contract Plans

- Portions of proposed bridge work would be dictated by geometry from the Design Models.

- Contract Plans would not be created for those elements of the project.

- Required information would be supplied as meta data such as tags.
Elimination of Earthwork Plan
Conventional Automation

• Data is managed through independent application specific interfaces.

• Applications are typically incompatible requiring redundant input.

• System is modular, allowing for new applications to be added as needed.
System Integration

- Data is managed through a single source of input.
- Interoperability is inherent.
- System is not modular, new applications cannot be added.
Integration by Data Model

• A set of data that is task-neutral or asset-oriented.

• The model is developed with a focus on the asset rather than downstream processes.

• Data models can include 3D geometry, geographic data, component properties and other technical data.
An information modeling system will have …

- Data supplied from a single source of input.
- Applications within the system be interoperable.
- Modularity, allowing for new applications to be added as needed.
- Be based on an open source nonproprietary format.
3D DESIGN, FABRICATION, AND VIRTUAL ASSEMBLY OF STRUCTURAL STEEL

- Expert Technical Group of specialists in 3D Engineered Models and Steel Fabrication
- Develop 3D Data Point File
- Choose file format to transfer engineering information
- Export the Design data CNC Shop Data
Opportunities to advance Civil Integrated Management (CIM): 3D-4D-5D Data Modeling

- Maintenance
- Design
- Photogrammetry
- Construction
- Design
- Strategy and Planning
- Aviation
- Office of the Commissioner

- Survey
- Construction
- Structures
- Regional
- Project Management Office
- FHWA
- Office of Legal Affairs