



Development of National Bridge Information Modeling (BrIM) Standards

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Introduction

Purpose of talk is to discuss opportunities and obstacles for expanding BIM into BrIM and standardization, with particular focus on federal perspective of:

- practice
- policy and regs
- government involvement
- organizational structures
- stakeholders
- culture.





Motivation

- To exploit full potential of computer technology
- Not just better, faster, cheaper, less errors, etc...
- To move away from “book keeping” towards more value-added engineering





Vision of Future

- Practice operates with digital delivery and exchange and storage of bridge information (save trees)
- Widespread interoperability between engineering software platforms is achieved
- Supports advanced modeling and analysis and visualization
- Transformation of practice
- Expand the virtual “world” (the Matrix, Avatar, drones)





Bridge Practice and Culture

- States are the “Owners”
- Design typically by private consultant
- Federal oversight and stewardship (not dictatorship)
- American Association of State Highway Transportation Officials (AASHTO)
- Resistance and/or inability to change
- Moving towards “design-build” procurement





Role of FHWA

- Approval authority on all “federal aid” projects
- Liaison members of AASHTO Committees
- Enforce Code of Federal Regulations
 - Design Standards
 - National Bridge Inspection Standards (NBIS)
 - Asset Management
 - Load Rating
- National Bridge Inventory (NBI)





Obstacles

- Bridge practice more “regulated” (public vs. private)
- State sovereignty
- Public ownership
- Software market forces





AASHTO SCOH JTCEED Res 10/24/09

- **RESOLVED**, That the Subcommittees on Design, Construction, Bridges and Structures and Information Systems support and endorse TransXML as the basis for the development and expansion of future schemas;
- **RESOLVED**, That the Subcommittees will review proposed TransXML schemas in these areas for approval by SCOH as official AASHTO standards;
- **RESOLVED**, That the AASHTO Standing Committee on Highways endorses TransXML.





AASHTO SCOH JTCEED Res 10/24/09

- A good step forward, but little follow on activity has occurred
- Stewardship model unclear
- Lack of funding
- Missing international collaboration





Opportunities

- Bridge Industry more “regulated” and centralized
- Top-down and bottom-up channels
- Every bridge has a “file”
- Every bridge requires a “load rating”
- Truck permitting and routing





FHWA Research

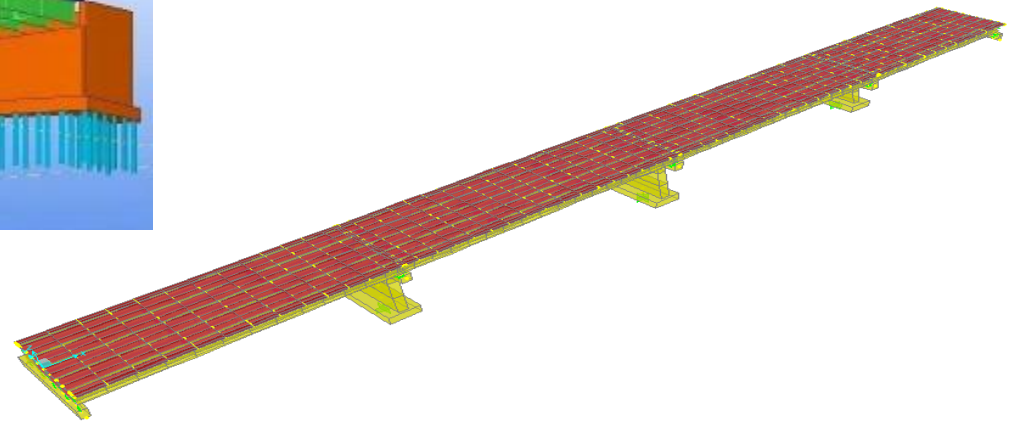
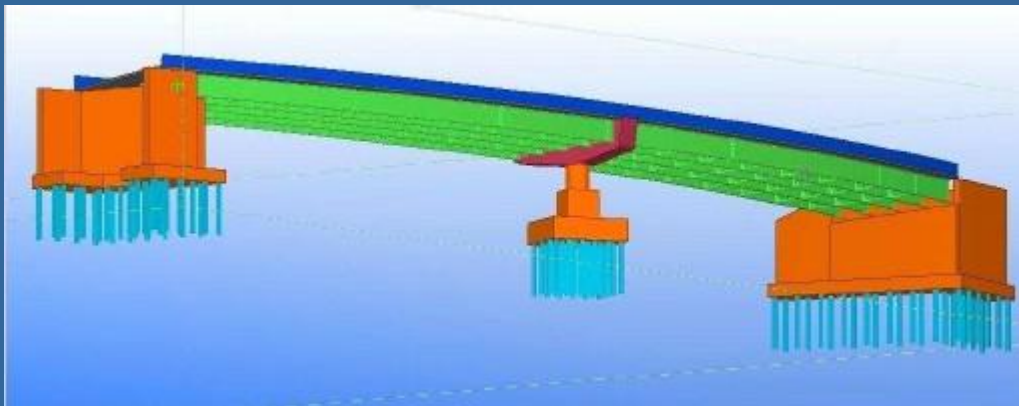
Efforts underway to develop, implement, standardize, and demonstrate an efficient and robust digital data exchange protocol (and file format) that could be used to digitally describe bridge engineering information





Why us? Why now?

- BrIM needs a catalyst/champion
- Commercial software vendors looking for standards
- Advanced modeling technology required by MAP-21
- FHWA can influence practitioners, owners, and software community





Scope of Work

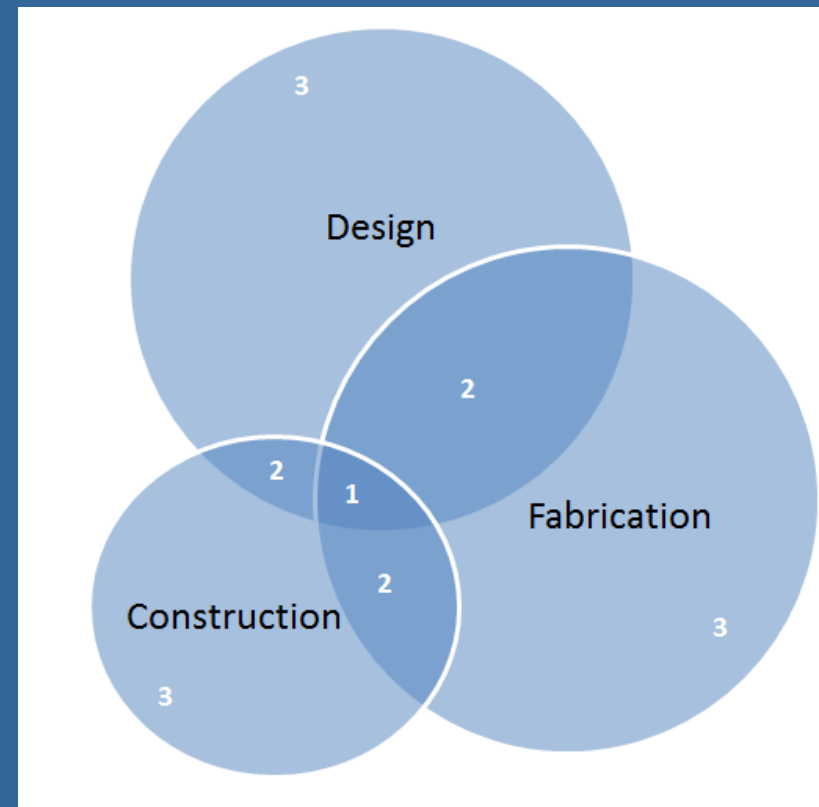
- **Subtask 12.1: Literature and Practice Review**
- **Subtask 12.2: Multi-Year Implementation Roadmap**
- **Subtask 12.3: Analysis of Bridge Activities**
- **Subtask 12.4: Identifying Information Items**
- **Subtask 12.5: Prototype 3D Viewer/Modeler**
- **Subtask 12.6: “Manual of Translator Development”**
- **Subtask 12.7: Demonstration Project**
- **Subtask 12.8: Training Materials and Reporting**





Analysis of Bridge Life Stakeholders

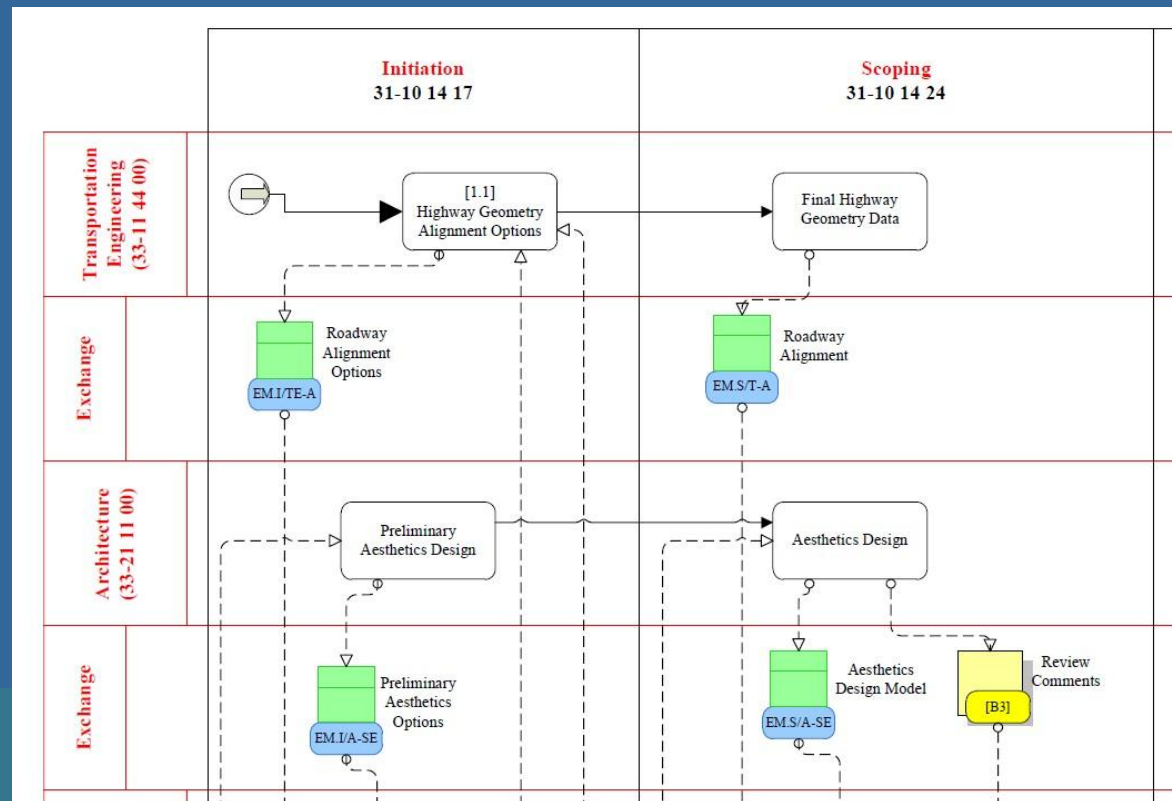
- Many stakeholders in evolution of project have need of same engineering information
- Most information lends itself to digital format
- 3 Levels, with increasing stakeholder interest





Identifying information Items

- Understanding of data exchange requirements in various stages of project development, delivery, and asset management





Visualization

- **Work will include development of a freeware viewer/modeler**
- **Vis is not the key focus of our work, but this work will promote use of visualization in engineering**
- **Vis of the BrIM model is important step to gaining widespread acceptance and avoiding commercial “bias”**





Deployment of BrIM Standards

- This work is intended to be “seed” development, with handoff to industry for long-term
- Standards will be open source, with management by consensus/consortium with credibility
- Schema definitions will utilize XML
- Need to revisit AASHTO Resolution and discuss the best path forward





Questions...

