OPENROADS DESIGNER – CONNECT EDITION
and
UNMANNED AERIAL SYSTEMS

Chris Swanson
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ONGOING INITIATIVES – EVERY DAY COUNTS (EDC)

Continue to advance 3D modeling throughout VDOT

• Enhance the coordination to develop, deliver, and maintain the transportation system
• Utilize 3D software and technology that assists these goals
Every Day Count (EDC) Initiatives

Most DOT’s are doing some 3D modeling. The real difference is how mature they are in the process, such as designing in 3D to providing the model to construction.

• **In July 2014**, VDOT volunteered to use 3D models
  • Bentley’s OpenRoads – SS4
OPENROADS TECHNOLOGY – SS4

Required for all Tier 1 and 2 construction and Tier 2 maintenance projects with minimum plans and above where new survey was completed on or after January 1, 2016

- Any project can be exempted from using OpenRoads by the State L&D Engineer
  - culvert replacements, hired equipment contractors, or HSIP
For OpenRoads projects **advertised after July 1, 2018**

- The 3D model shall be provided to any bidding contractor at contract advertisement
- Supplemental information source for the project construction
- Not required to be digitally signed
Long Term Goals - VDOT will continue to evaluate as to whether 3D models that are developed during project design will be an article in the contract documents
What’s the problem?

“Specialists in the various disciplines have been able to optimize their own in-house operations … most failures are caused by poor handoffs between disciplines.”

- Tommelein and Gill (1999)
OPENROADS DESIGNER – CONNECT EDITION

- Plan
- Survey
- Design
- Contract
- Construct
- Maintain

- 3D Project Development
- e-Construction
- Electronic As-builts
- Asset Management
What’s the solution?

Better data flow across applications and disciplines through the use of **intelligent** data.
Integrated Modeling Environment

- ContextCapture
- ConceptStation
- Construction Integration
- OpenRoads Navigator
- OpenRoads Designer
- LumenRT
- MicroStation Connect Edition
- gINT Civil Tools
- OpenBridge Modeler
- Point Tools
- SUE/SUDA
Trimble and Bentley Systems announced today the next advance of information mobility between project design and field construction. Using Bentley’s ProjectWise collaboration servers and services, along with its i-model technology for the open exchange of Infrastructure Information, and Trimble’s Business Center – a Cloud office software, an integrated workflow for road and site construction is now possible. The U.S. Federal Highway Administration, as part of its “Every Day Counts” vision, has recognized that using 3D models with GPS-enabled heavy equipment for road construction can increase productivity by up to 50 per cent. Trimble and Bentley are at the forefront of enabling this vision by joining forces to optimize the transfer of information-rich 3D engineered models to 3D constructible models.

The announcement was made today at the Transportation Research Board A/380 2014 Summer Committee Meeting.

Topcon announces connectivity enhancements with Bentley Systems

LIVERMORE, Calif., U.S. / CAPELLE A/D IJSSEL, the Netherlands – October 9, 2017 – Topcon Positioning Group announces advances in its direct communication between the Bentley Systems design applications and the Topcon suite of software solutions with the release of MAGNET® 4.3.1. The MAGNET Enterprise Data Manager is designed to allow operators to directly access Bentley ProjectWise data with MAGNET Field, MAGNET Office or MAGNET Enterprise applications.

“The updates are part of our commitment to working with third-party software applications, such as the Bentley offering, to provide efficient data exchange and a seamless workflow environment,” said Jason Hallett, Topcon vice president of global product management. “When connected to MAGNET Enterprise from MAGNET Field, you can directly upload and download data from ProjectWise, allowing surveyors or machine control model-builders upload or download iModels or other project file types.”

The integration is designed to simplify data transfer from design to field, with the unique ability to read and import only the data users need for their projects.

“It builds upon our industry-first ability to offer ‘round trip’ iModels — sending them directly to field operators who can use and update them directly on the jobsite, and then send the updated iModels from the field back to Bentley ProjectWise,” said Hallett.
Status

Workspace Migration
Functional Workspace

Plan Development
Offsite
- Prepare findings and recommendations
- Develop a draft implementation plan

WHERE WE ARE TODAY

Discovery Workshop
2 days onsite

Tech Day-TBD

Plan Presentation
onsite

Detail Scoping and Prepare Proposal

PO, Kickoff, Execute Project
UNMANNED AERIAL SYSTEMS

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UPDATE ON VDOT’S UAS EFFORTS

In the summer of 2017, VDOT decided to strengthen our expertise in using Unmanned Aerial Systems (UAS) to achieve high performance.
UPDATE ON VDOT’S UAS EFFORTS

Develop of an UAS Program with the following goals
• Realize cost savings in project development, delivery, and maintenance
• Provide consistency in use across VDOT and reduce liability
• Strengthen our use of technology to achieve high performance
UPDATE ON VDOT’S UAS EFFORTS

Form a standing workgroup of Divisions and Districts
• Communications
• Construction
• Environmental
• Location & Design
• Maintenance
• Operations
• Structure and Bridge
• Traffic Engineering
EARLY EFFORTS OF WORKGROUP

- Evaluate national landscape
- Identify methods of delivery
- Identify possible use cases
- Develop program and policies
EVALUATE NATIONAL LANDSCAPE

Efforts
• Participate in webinars and forums
• Host a peer exchange with DOTs
• Issue RFI (early 2019) to consultant industry

Takeaways
• Develop policies and procedures
• Have a consolidated program
• Identify specific use cases (consider return on investment)
• Utilize contracted services (at least in its infancy)
METHODS OF DELIVERY

Consider maintain a fleet or contract services?
• Multiple types of UAS depending on the intended use
• Spatial distribution across state
• Emerging technologies
• Qualifications of Remote Pilot in Charge (RPIC)

Takeaways
• Utilize contracted services
• VDOT purchase and RPIC is restricted
EVALUATION OF USE CASES

- Infrastructure inspection of structures
- Incident and traffic management
- Imagery and video for outreach and education
- Damage assessment after severe weather events
- As-built/construction record documentation
- Volumetric measurements

- Land surveying and/or aerial imagery
- Inspection of hazardous areas
- Environmental assessments
- Construction/post-construction monitoring
- Rock slope stability and other change detection
- Verify compliance of work zones
Next Steps

- Develop flight management system
- Work with other entities (state agencies, industry)
- Identify consultant services
QUESTIONS