ODOT: TRANSITIONING TO DIGITAL
ODOT Transition - Iterative Steps

• Usage of Home-grown database - DOS based CMS - 1992
  - Continued paperwork - payment driven reason

• Advertisement / Distribution of Plan Sets / Electronic Bidding - 2004
• Requirements Management concept - DB Project in Columbus - 2011
• SiteManager by AashtoWare - 2011
  o Continued paperwork
• Mandate of all documentation to be stored electronically - 2014
  o Scanned data or created Digital Data
OHIO DOT TRANSITION TO DIGITAL PROJECT DELIVERY

- P3 Project - Portsmouth Bypass - 2014
- EDC eConstruction Initiative - 2015
- Acceptance of Digital Signatures - 2015
  - Digital Project Records / Change Orders
- Digital Information - Contractual July 2015
  - 3D Pilot Project - Grades/X-sections
3D/4D Model - EDC #3 Pilot Project

- Meetings with Industry to discuss knowledge base and specification development Dec 2014
- Completed Model late Feb 2015
- Completed Specifications - April 24 2015
- Advertisement - May 21 2015
- Sale - July 23 2015
3D Model
- Provided Land XML files (horizontal, vertical, existing and proposed 3D surfaces), GEOPAK coordinate data base and triangle models, and CADD Basemaps

3D Model was contractual for ...
  - Roadway profile grades and elevations
  - Pavement grade breaks, slopes and surface elevations
  - Earthwork elevations including surface and slopes

4D Model
- Required to provide one or more virtual models that depicted...
  - MOT Phasing
  - Earthwork locations with quantities
  - Pavement phasing with quantities
OHIO DOT TRANSITION TO DIGITAL PROJECT DELIVERY

- Full use of Mobile Inspector - July 2016
  - No other project record by Inspector
  - Grass Roots expansion
- Full commitment from IT: Complete Mobile Workforce - June 2017
- Electronic Only Quality / Performance Documentation - June 2017
  - Electronic Documentation - automated storage
Commitments / Decisions to Date

- Use it if we have it
- Support / Expand the inclusion of Consultants and Contractors into the Systems
  - Virtual Desktops
  - Inclusion into systems
- Agnostic Approach: Comfort Level = Usage Level
ELECTRONIC INSPECTION: OVERVIEW - RISK BASED EVALUATION / QUALITY ATTRIBUTE COLLECTION

- FHWA Requirements
  - Need to document the inspection activities for quality of workmanship
- Risk Based Inspection prioritization
- Streamlined and standardized data gathering
- Computer based document storage
Pilot Project began July 2017
2 Pilot projects were selected in each District
All forms were completed
All Personnel had some type of Portable Electronic Device (iPhone, 2 in 1 Computer, Android Tablet, iPad)
ELECTRONIC INSPECTION: OVERVIEW

To Date:

- January 1, 2018 - all projects sold on or after this date are to use GoFormz
- All Districts have been trained
- Bi-weekly GoFormz meetings to gather District input
  - AASHTOWare Project SiteManager e-Construction Group
  - The Construction Administration Specialists
  - District & Consultant call ins!
- Consultant training sessions
Prioritization of Inspection Activities
Most PLN folders (when completed) had at least one *Quantity* form.

We were unable to determine if the proper Risk Based Inspection priority was made in general.

Further correlation with SiteManger Daily Work Reports could allow a check to see if the proper frequency was done.
## ELECTRONIC INSPECTION: RISK BASED PRIORITIES

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<tr>
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<th>Item No.</th>
<th>Description</th>
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<th>Doc Priority</th>
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<th>Spec Chair</th>
<th>Quality Form</th>
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Prioritization of Documentation Requirements

1 - Minimum once per day
2 - Minimum once per Item
3 - Minimum once per group of similar items
An example of the 614 Maintaining Traffic form
DIGITAL INSPECTION

- Next Steps
  - Fully Digital Inspection Database - not just electronic
DIGITAL INSPECTION: CONCEPT

Mobile Forms Pre-Loaded Contract Requirements

- Inspectors use automatic filters to instantly sort 1000’s of requirements to obtain only those applicable to the observed work
- All applicable requirements are available to the inspector, regardless of severity rating
- Mandatory checklists available
- Mobile forms work online or offline
Objective Evidence Required:

- Inspectors may record whether the work is nonconforming or conforming.
- Photo evidence is required whenever nonconforming work is discovered.
• Inspectors can provide captions
• Mark-ups provide insight into the inspector’s findings
Requirement Verification Report

- Location of the inspection
- Actual contract requirements verified
- Inspector findings noted
- Objective photo evidence provided relative to each verified requirement
Reports are Generated On-Demand

- Report size will adjust to the volume of data/photos collected
- Data is stored in the system, not PDF’s – reducing the overall storage requirement
Issue Resolution History

- Resolution history table provided
- New record entered into table each time inspector or contractor updates the status
- Image thumbnails are associated to the status update
• Initiated in 2018
  • SiteManager no longer supported
• Specialty groups of user and oversight tailored to specific configuration requirements
• Continued use of Mobile Inspector
• Incremental rollout
• Feb 2020
AASHTOWARE PROJECT IMPLEMENTATION

• Difficulties
  • Funding
  • Material acceptance methods
  • Role determination
STATUS OF ODOT TRANSITION TO 3D MODELING

• Engineering/Design Perspective
  • Transitioning to OpenRoads Designer (ORD)
    • Transition Timeline
  • ProjectWise Implementation
    • Cloud hosted
    • Simultaneous implementation with ORD
  • Electronic Design Deliverables Initiative
    • Status of a 3D model as a deliverable
# ODOT ORD Transition Timeline

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<th>Key Dates</th>
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<td>OHDOT Standards for CE Released</td>
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<td>May, 2019</td>
<td>Survey Training Begins</td>
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<td>July, 2019</td>
<td>Design Training Begins</td>
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<td>January 1, 2020</td>
<td>All New Projects Started in ORD</td>
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<td>• Projects filing after Dec. 31, 2021 converted to ORD (a waiver</td>
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<td>can be submitted)</td>
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<td>• V8istd (SS1/SS2 Standards) no longer available</td>
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<td>July 1, 2020</td>
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ODOT ORD TRANSITION TIMELINE

- Website
- Formal Transition Plan
- Communication Plan
- Documented Waiver Process
- Transition Status Reports
- Running FAQ Document

http://www.dot.state.oh.us/Divisions/Engineering/CaddMapping/CADD_Services/ORD-Transition/Pages/default.aspx
ELECTRONIC DESIGN DELIVERABLES INITIATIVE

• Previous Standards and Practices
  • Appendix E of the CADD standards manual
    • Electronic Submission Checklist
  • Plan Package Submittal Process
    • Does not include requirements for CADD files
    • No check of what CADD files are submitted
    • CADD files not seen as contract documents
      • For reference only*
  • Offices involved in tracking down CADD files
    • Districts, Consultants, Central Office Construction, Central Office Contracts, Central Office CADD Services

* 3D models will still be considered for reference only in the current plan
ELECTRONIC DESIGN DELIVERABLES INITIATIVE

- New Standards and Practices
  - Getting ready for 3D models
    - FHWA Every Day Count Initiative
    - Need to start getting digital files on current projects
  - Electronic Design Deliverables Document
    - Document clearly defining what electronic files are required for ODOT project submission
      - Draft was available for review and comment in late 2017
      - Comments/questions collected and addressed (See FAQ)
    - Formally released April 30th, 2018
    - Guidelines for Electronic Design Deliverables
3D MODELING NEXT STEPS

- **Hurdles**
  - Level of Detail (LOD) inside the model
    - Rebar modeling, headwalls, etc.
  - User familiarity with software
    - Different mindset with design intent
  - Legal and risk analysis
  - File formats
3D MODELING NEXT STEPS

- Building an Intelligent Model
  - Extraction
    - Assets
      - Not just for location
  - Pay Items
- Hyperlinking
  - External modeling based documents
- Model Design Review