

Michigan's e-Construction Journey

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Michigan DOT

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A Reminder – Why?



A Reminder – Why?



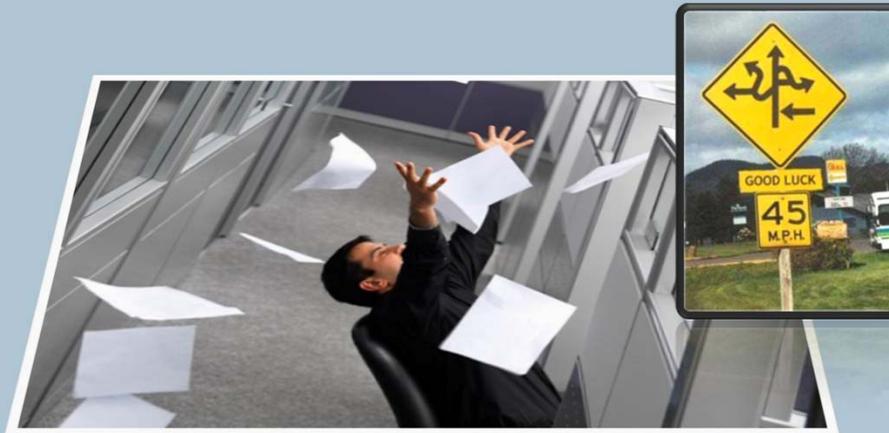
A Reminder – Why?



Inspector Burdens



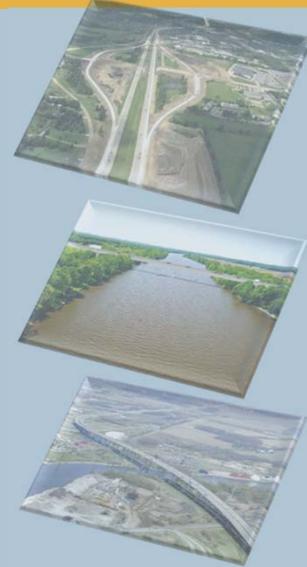
MDOT Initial Motivation - Lost Documents!



e-Construction Pilot Projects

- **Pilots projects started construction in October 2012**

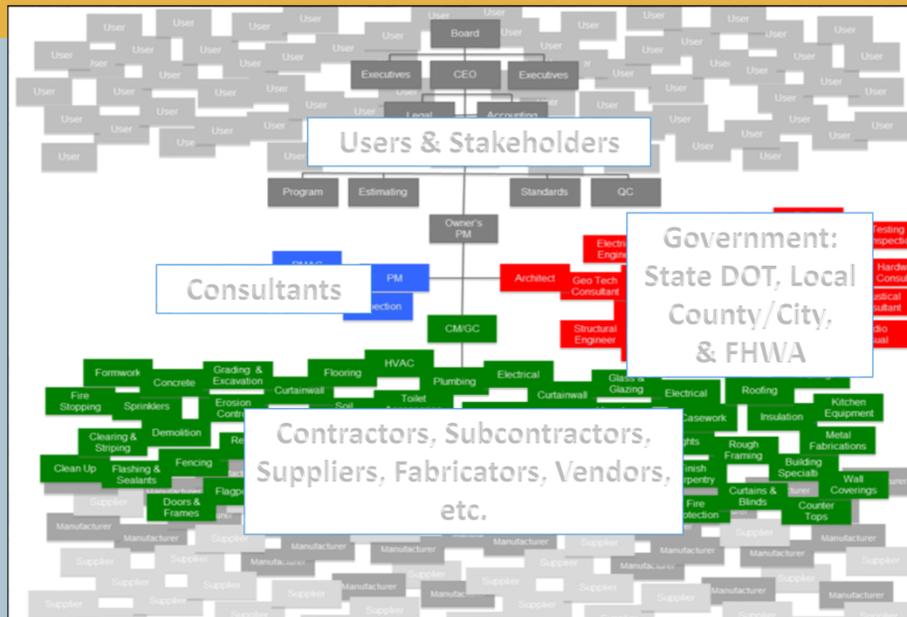
- I-96 Latson Road (\$25M)
- M-231 Little Robinson Creek (\$68M)
- M-231 over the Grand River (\$9M)
- I-75 Zilwaukee Bridge (\$35M)



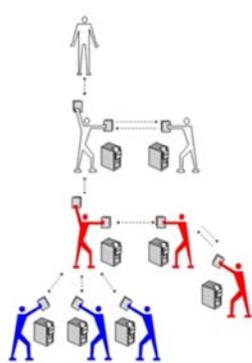
Pilot Tasks

- Developing Standards
 - Electronic system file names
 - Document naming conventions
 - MDOT documentation
 - Contractor documentation
- Firewall
- Construction Managing Office
 - Network latency/throughput
- Getting all business areas on board
- Develop Pilot Special Provision

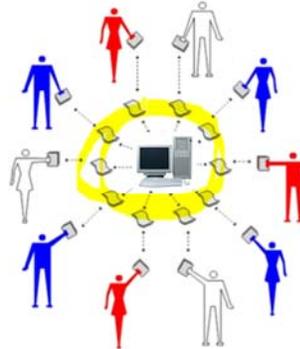
Number of People Involved in a Construction Project



A Centralized Sharing Model



Traditional



Collaborative

Auditability, Accountability, Transparency

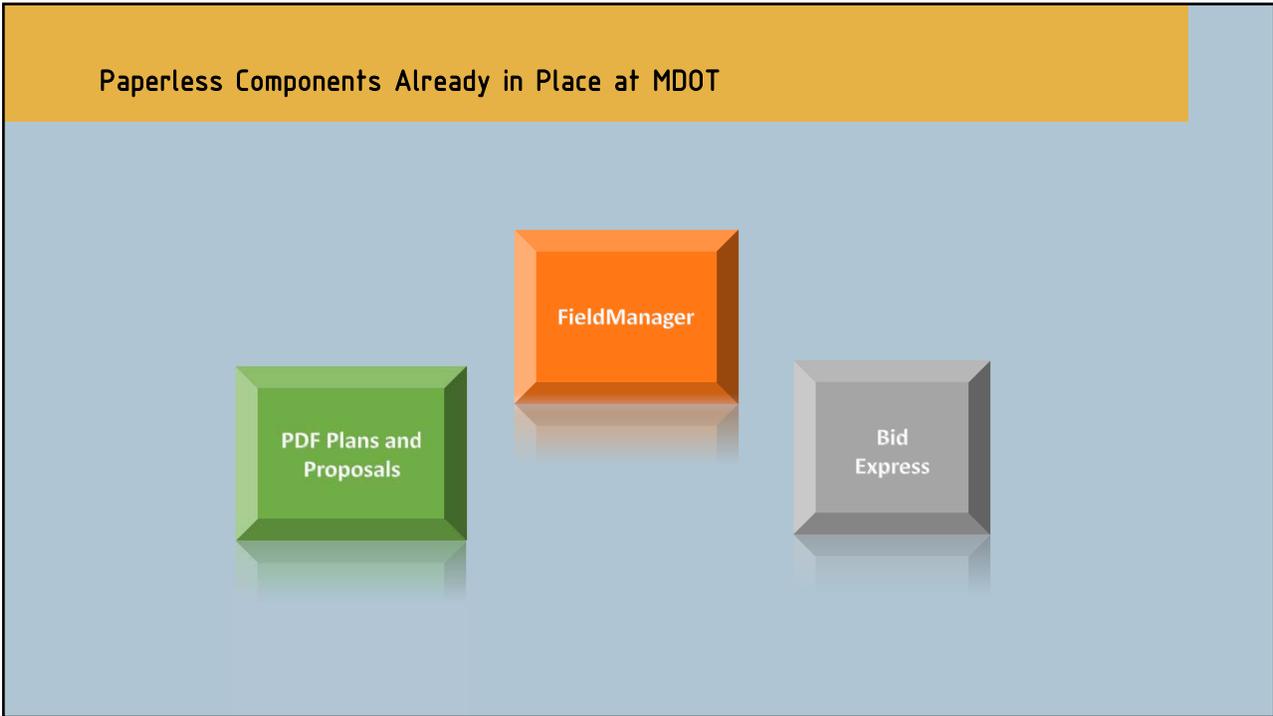
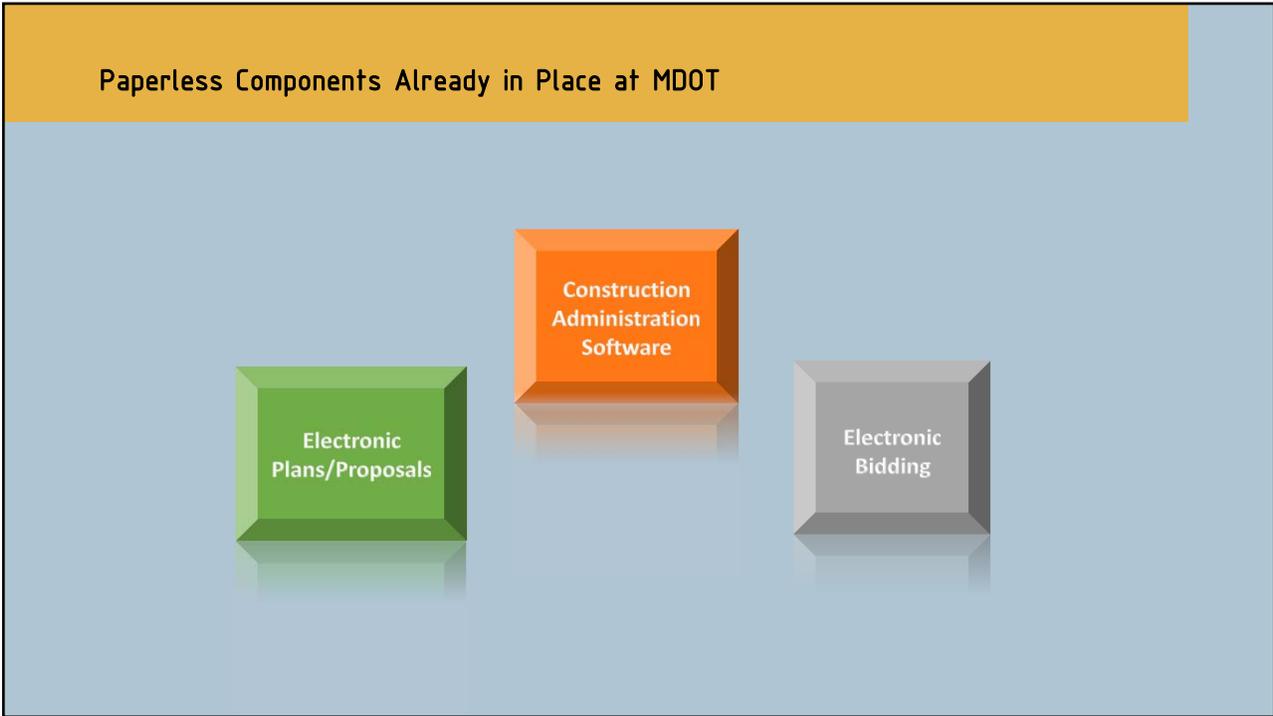
Construction & Design



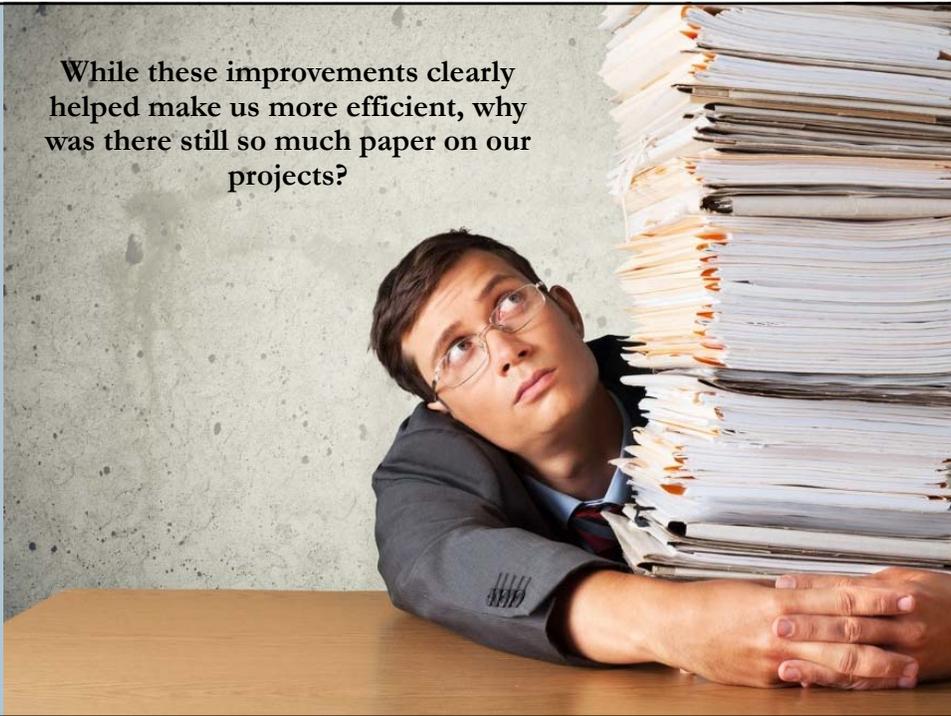
Issues

- July 2012 – Michigan Infrastructure Transportation Association (MITA) and MDOT Leadership Meeting
- Third-party software proposals
- MDOT Engineering Support Services got involved and offered a solution





While these improvements clearly helped make us more efficient, why was there still so much paper on our projects?

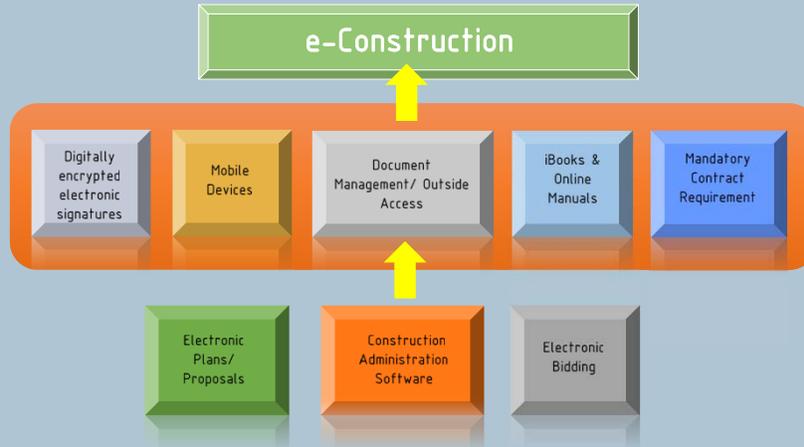


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e-Construction

The culmination of several automated processes resulting in paperless construction.

Final Steps to Reach "Paperless" Goal



Process Discovery



ProjectWise Solution



Electronic Document
Submission



Secure Storage



Workflows



Accessible



Single Source of Truth



Transparent



Digitally Encrypted
Electronic Signatures

Mobile Devices

Challenges

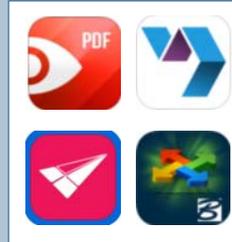
- Public perception and acceptance
- Field staff embracing new technology
- Management approval of purchase costs
- Areas with poor coverage



Mobile Devices (continued)

Advantages

- Less prone to errors
- Data gathered in the field is transferred directly to office without re-keying
- Real-time access to all project documents
- Field, Office, and Specialist Staff are connected
- Instant transfer and storage of documents
 - Field Inspectors spend more time on the job site



Mobile Devices (continued)



Laptops still prevalent



Field Staff issued iPhones - 1100



Field Staff Issued iPads – 600

Windows Tablets - 160

Digitally Encrypted Electronic Signatures

- Adobe Acrobat®
- Investigating agency-wide solution



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Developing Policy

- Special provision developed for pilot projects
- Current specifications were reviewed
- Development of construction WIKI site

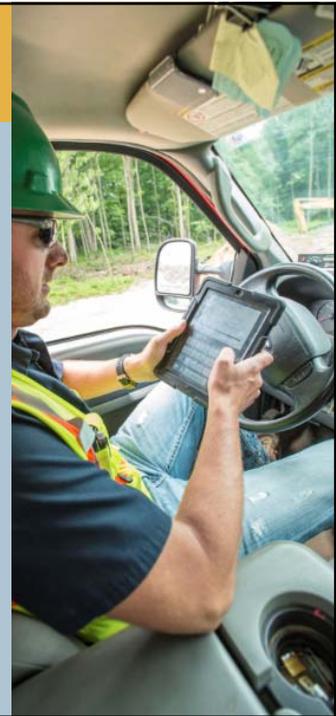


A Necessary First Step



Other Key Contract Administration Issues for Implementation

- FHWA Michigan Office formal approval of paperless contract administration process
- Compliance with FHWA Contract Administration Core Curriculum Manual & other applicable regulations
- Compliance with CFR 23 & CFR 49 DBE regulations
- Compliance with Federal Davis Bacon Prevailing Wage requirements/payrolls
- Insuring process is accessible for all parties & does not create artificial barriers



Michigan e-Construction Team (1)

- Stuart Laakso – ProjectWise Construction Analyst
- Heather VerHage – ProjectWise Administrator
- Rachelle VanDeventer – Design Engineer Support
- Cliff Farr – MDOT e-Construction Coordinator
 - 517-897-3672, farrc@michigan.gov



Michigan e-Construction Team (2)

- Construction Contractors
 - Glenn Bukoski – VP of Engineering Services
 - Michigan Infrastructure & Transportation Association
- MDOT
 - Andy Esch – Information Security Officer
 - Steve Hawker – Materials Supervisor
 - Rick McGowan – Construction Inspector



Where Is MDOT Today?

The following stakeholders are in production, including:

- All MDOT construction & materials offices
- 303 contracting firms
 - 860 contractor users
- 58 consultant firms
 - 1017 consultant users
- 22 FHWA users
- 4 Cities; 9 users
- 9 counties; 31 users
- 252 active or finalized contracts
 - ~ \$1.5 billion as-let contracts





Polishing e-Construction for 2016

- Statewide enhancements
 - Too many folders?
 - Document naming standard
 - Truncated names
 - Document originator
 - ProjectWise:
 - Search tools
 - Work flow enhancement

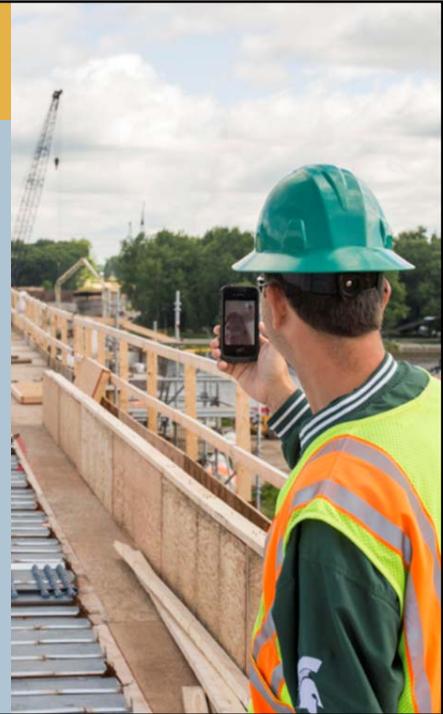


Next Steps

- Delivery Tickets
- Local Agency e-Construction Implementation

Other 2016 e-Construction Priorities

- Digitally encrypted electronic signatures
 - iPad
 - Enterprise
- Remote connectivity
 - Boosters
 - Satellite
- Tablets
- Network efficiency



Mobility is Key!

<http://mdotwiki.state.mi.us/construction/index.php/E-Construction>



Fillable Forms & Online Manuals

- Fillable Forms
 - Templates
 - Voice Recognition
- MDOT WIKI Construction Manuals
 - Instructions & Training
 - Always up-to-date
 - Mobile Access
- YouTube Training
- Contract Plans
- Online Standard Plans

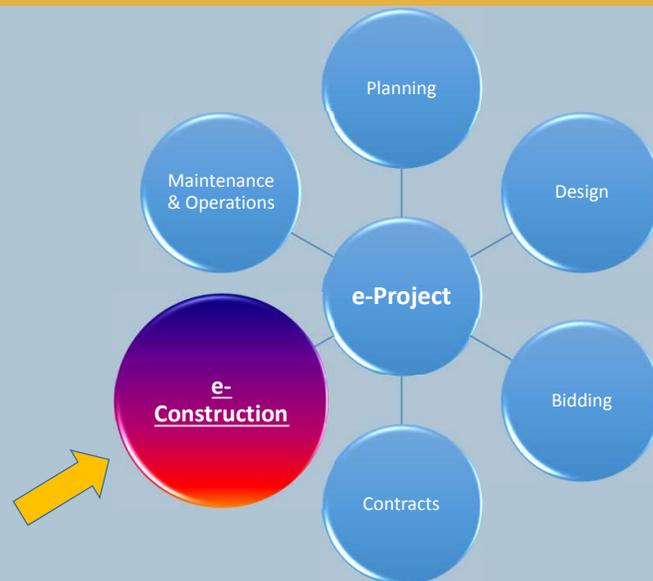


That was then...

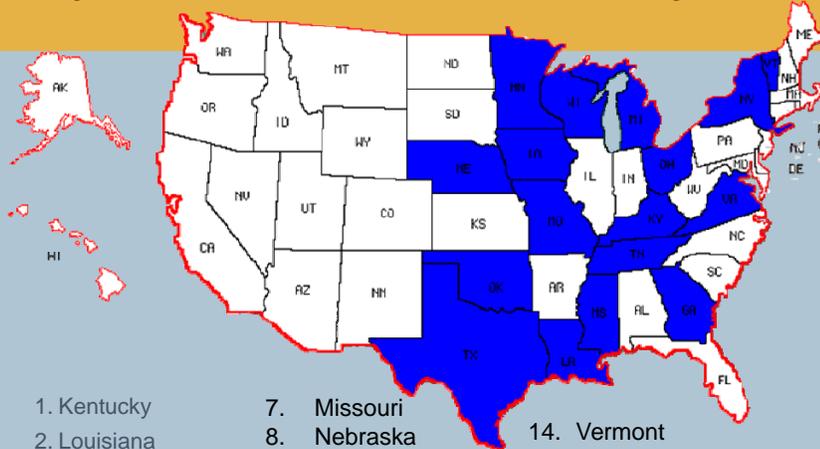


This is NOW.

Transforming the Michigan DOT



AASHTO Project Construction/Materials Project States



- | | | |
|--------------|---------------|---------------|
| 1. Kentucky | 7. Missouri | 14. Vermont |
| 2. Louisiana | 8. Nebraska | 15. Virginia |
| 3. Georgia | 9. New York | 16. Wisconsin |
| 4. Iowa | 10. Ohio | |
| 5. Michigan | 11. Oklahoma | |
| 6. Minnesota | 12. Tennessee | |
| | 13. Texas | |

Deployment Efforts

- Michigan is participating with the combined FHWA & AASHTO effort to share e-Construction innovations through:
 - Every Day Counts-3 Initiative
 - AASHTO Innovation Initiative (formerly Technology Implementation Group - TIG)
- MITA participation also:
 - Home office: Glenn Bukoski, Rachelle VanDeventer
 - Contractor: K&R, Inc.: Dan Ringnald



Conclusion



Want to Learn More?



- The e-Construction Process at MDOT:
<https://www.youtube.com/watch?v=HAbYgggnyB8>



- Mobile Devices in the Field:
https://www.youtube.com/watch?v=y_9XCy2IQ2w



- e-Construction on the 96 Fix:
<https://www.youtube.com/watch?v=ScB1b3fqjQo>

- Cliff Farr, FarrC@michigan.gov, (517) 897-3672



•Questions?