



e-Construction

PEER-TO-PEER EXCHANGE

Summary Report



Missouri Department of Transportation and
Illinois Department of Transportation

April 26, 2016
St. Louis, MO



Table of Contents

1. Background	3
2. e-Construction Implementation – Key Peer Exchange Findings	4
3. Peer Exchange Discussion Notes	6
3.1 Exploring State Presentation – Illinois DOT e-Construction Status and Plans.....	6
3.2 Host State Presentation – MoDOT e-Construction Overview.....	7
3.3 Demonstration of Host State e-Construction Technologies and Systems (SiteManager)	9
3.4 Collaborative Project Sites – ProjectWise and SharePoint Demonstrations.....	10
3.5 e-Construction Mobile Devices	12
3.6 Digital Signatures	13
Appendix A – e-Construction Peer Exchange Agenda.....	15
Appendix B – e-Construction Peer Exchange Roster	16
Appendix C – List of Standard Apps in use on MoDOT Tablet Devices and Smartphones	17

1. Background

The Missouri Department of Transportation (MoDOT) hosted a peer exchange with the Illinois Department of Transportation (IDOT) in St. Louis, Missouri, on April 26, 2016. The focus of the peer exchange is e-Construction, or paperless construction administration delivery processes that include electronic submission of all construction documentation by all stakeholders, electronic document routing/approvals (e-signatures and digital signatures), and digital management of all construction documentation in a secure environment that allows distribution to all authorized project stakeholders through mobile devices. The event was sponsored by the Federal Highway Administration (FHWA), and representatives from each participating State's FHWA Division Office also participated in the event.

The morning session (see Appendix A for the full agenda) served as a preface to the peer exchange and allowed for personal introductions, along with background information on each State's construction program and e-Construction activities. The IDOT introductory presentation focused on several systems developed in-house that have been used to manage contract documentation and materials data. IDOT intends to begin reconfiguring internal electronic systems in 2016 based on an updated plan for implementation. MoDOT provided background on a new SharePoint site named "eProjects" that is being used in addition to SiteManager for all project related documentation and correspondence.

The afternoon session consisted of discussion on additional technologies and systems in use in Missouri, including a detailed demonstration of the integration of construction information into ProjectWise, a software application already extensively used during the design phase of projects. The peer exchange also included additional discussion sessions on MoDOT's e-Construction field devices (both the iPad and Windows-based devices) and the FHWA Division Office Pilot for tablet devices (the iPad and the Surface Pro) for inspection activities. The peer exchange concluded with a demonstration and discussion session on digital signatures, along with summary discussion on next steps, action items, and follow-up activities.

The Peer Exchange is the seventh in a series designed to assist States with implementation while allowing peers to network and share information across State departments of transportation in a relatively small group setting. The list of attendees (representing construction and IT personnel), along with contact information for each, is provided as an appendix to this document to promote further networking among participants. Attendees plan to continue dialogue between the two States after the event.

This report includes a summary of key findings from the event, links to relevant documents, and the full notes from the peer exchange discussions.

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2. e-Construction Implementation – Key Peer Exchange Findings

The peer exchange produced several relevant and practical findings identified through group roundtable discussions. The following sections outline the items highlighted by the group as next steps, implementation ideas, document exchanges, or focus areas—all of which are designed to assist with future implementation within the States' e-Construction programs. Where available, Web site links to resources are provided for practices currently in use by the agencies.

IDOT developed a web-based tool, webMISTIC, that allows filtering and querying to generate excel downloads and .pdf reports for data analysis. This tool pulls data from **Materials Integrated System for Test Information and Communication (MISTIC)**, a department-wide database containing materials inspection and test information (developed in-house). The web-based tool is hosted and maintained by Northern Illinois University. IDOT also uses the **Illinois Construction Records Systems (ICORS)** as the preferred method for construction documentation.

Link to IDOT ICORS training manual:

<http://www.idot.illinois.gov/assets/uploads/files/doing-business/manuals-guides-&-handbooks/highways/d8/icors-referenceandtrainingmanualoffice2010-d8.pdf>

Link to IDOT manual for materials inspection, with references to input formats for MISTIC data:

<http://www.idot.illinois.gov/assets/uploads/files/doing-business/manuals-guides-&-handbooks/highways/materials/materialsinspectionmanual.pdf>

MoDOT developed an electronic Engineering Policy Guide (EPG) and no longer prints standards and specifications for use on projects. MoDOT also published **standard plans formatted for mobile devices** (e-pubs) in 2009.

Link to MoDOT EPG, 2011 Specification Book for Highway Construction, and Standard Plans:

http://epg.modot.org/index.php?title=Main_Page

http://www.modot.org/business/standards_and_specs/highwayspecs.htm

http://www.modot.org/business/standards_and_specs/standardplans.htm

Participants discussed the legal challenges with **implementation of digital signatures** and also the need to obtain industry input to the process, including industry organizations such as contractor and professional engineering associations. MoDOT uses Adobe signatures and also signs and seals plans electronically, and uses Bluebeam Revu's digital signature capabilities on as-built drawings. FHWA has also linked several Federal resources on use of digital and electronic signatures to the e-Construction site.

Link to MoDOT Digital Signature Quick Reference Guide:

http://www.modot.org/business/contractor_resources/Quality_Management/Digital_Signature_for_Adobe_Pro_10_Contractors.docx

Link to Bluebeam Revu for the iPad:

<http://www.bluebeam.com/us/products/revu/ipad.asp>

Link to Federal publications on use of digital signatures and electronic signatures:

<https://www.fhwa.dot.gov/construction/econstruction/library.cfm>

Mobile devices have shown cost savings for inspection and maintenance activities by reducing the time needed to document activities. MoDOT has piloted the iPad and also a Windows-based tablet. Additionally, MoDOT provides devices to employees and also has a stipend program for personal devices used for business purposes. FHWA is also piloting use of tablet devices for inspection activities in Florida, Iowa, Michigan, Missouri, North Carolina, Pennsylvania, Texas, and Utah (iPad and Surface Pro).

Link to MoDOT “One Phone” Program, including frequently asked questions:

<http://asis.transportation.org/Documents/Cellular%20Stipend.pdf>

Link to Washington State research study on the benefits of using tablet devices for inspection:

<http://www.wsdot.wa.gov/Research/Reports/800/840.2.htm>

Link to FHWA e-Construction Mobile Device Pilot Interim Report:

https://www.fhwa.dot.gov/construction/econstruction/do_pilot_interim.pdf

Link to SharePlus software for use of SharePoint on mobile devices:

<http://www.infragistics.com/enterprise-solutions/enterprise-mobility/shareplus>

FHWA provides funding sources for implementation of e-Construction technologies and applications.

Links to Grant and State Transportation Innovation Council funding sources:

<http://www.fhwa.dot.gov/accelerating/grants/index.cfm>

<http://www.fhwa.dot.gov/stic/>

MoDOT developed a software tool for converting Excel-based inputs from contractors and MoDOT personnel into data that is imported into an Oracle database. The system checks network drives for changes to Excel files and automatically imports the data. MoDOT shared their process for both E20 – Excel to Oracle, and CRE20 – Contractor Excel to Oracle.

IT resources are often housed separately from the DOT within State government. For example, the DOT may rely on IT support from a State Office of Information Technology. To further enhance implementation of e-Construction, **IDOT is developing a job description** to potentially use in the future for a dedicated IT staff member in the Bureau of Construction.

MoDOT has a list of standard apps for use on the iPad and Windows-based tablet devices. The list can be found in Appendix C of this document along with a description of each.

3. Peer Exchange Discussion Notes

This section provides additional notes following the organization of the agenda. Question and answer sessions followed each presentation and demonstration (labeled “Q” and “A” in the notes). The full agenda for the peer exchange is included as an appendix to this document, along with a roster of participants with contact information for each attendee.

Jennifer Harper kicked-off the peer exchange and provided opening remarks for MoDOT and provided a safety briefing. MoDOT greatly benefitted from the prior peer exchange with Colorado and is interested in gaining additional insights from Illinois practices. Tim Kell with Illinois DOT provided a background on the selection of Missouri and the practices of interest, including the fact that both agencies share contractors that perform work in both States. IT staff noted interest in how SiteManager is administered and how MoDOT uses mobile devices. Representatives from the Central Office in Springfield, Illinois discussed the decentralized implementation of projects in Illinois. Both States are similar in terms of structure which also allowed for the peer exchange fit. MoDOT implements new processes by involving the district offices in the discussion to ensure consistent statewide implementation.

Rob Fijol with FHWA’s Michigan Division Office outlined FHWA initiatives in e-Construction. Michigan DOT implemented ProjectWise and is using e-Construction technology on trunk line projects. For day-to-day management of construction projects, e-Construction is allowing for direct access to inspection files, records, and data. Electronic signatures are also providing benefits to Michigan and the FHWA Michigan Division. Michigan DOT had a diverging diamond interchange project that experienced time savings based on reaching the appropriate approvals from personnel that were out of State when approvals were needed. Michigan is also capturing data flows in real-time, and the accuracy has been improved with e-Construction and provides for better claims processes.

3.1 Exploring State Presentation – Illinois DOT e-Construction Status and Plans

Tim Kell and Tom Schutzbach with IDOT provided a background presentation on the Illinois construction program and the goal of paperless processes. Current practices include paper-based processes for construction and materials documentation. IDOT currently uses the Illinois Construction Records System (ICORS), contract payment systems, materials testing systems (MISTIC), and IDOT uses ExeVision for electronic bidding. Email is also used frequently for communications. ICORS becomes the digital quantity book for the contract, and a text file is emailed and downloaded to a mainframe system for payment processing. IDOT allows contractors to submit bids electronically and also sign bids with digital signatures, but the contracts are executed with wet signatures. Illinois strongly encourages electronic bidding but it is not mandatory. Roughly 75% of all bids are submitted electronically. IDOT does not want to create a situation where a disadvantaged business might not have the proper resources to submit bids electronically. MoDOT has quarterly meetings with contractor associations to gather input from industry on similar technology implementation activities.

Authorizations of contract change are printed in the field, mailed to the central office and manually entered into the contract payment system, experiencing longer timeframes for processing. With e-Construction processes, IDOT anticipates realizing benefits in approval times and processing times. The comptroller requires wet signatures on change orders in order to make payment on the item. Information is loaded on a laptop for storage and inspectors fill out reports and the resident engineer enters the data into ICORS. Pay estimates are emailed – a macro pulls payment information from an email and submits to the mainframe system. With BCM (the IDOT mainframe system), errors are minimal and this system has been used for

several decades. The Illinois comptroller pays contractors electronically and charges a small fee for issuing a paper check.

MoDOT handles funding splits in SiteManager, but they are mainly managed at the financial level. If MoDOT and a local agency each provide funding for a project, SiteManager will allow input of the 50/50 split of project costs, for example. IDOT has direct oversight of federally funded local agency projects. IDOT plans to obtain local agency input and district input when moving to any new contract management system.

IDOT also developed a web-based application (webMISTIC) that is maintained and hosted by Northern Illinois University. This system pulls materials data from MISTIC such as for aggregate, hot mix asphalt, materials inspection tracking, as well as contract pay items. Nine districts and the Central Bureau of Materials & Physical Research all use the web-based system for data analysis. IDOT plans to replace ICORS, MISTIC, and webMISTIC with a web-based contract administration system, implement digital signatures for contract administrations, use tablets in the field, deliver 3D models, and develop specifications and procedures for modern construction staking. IDOT will begin the procurement process in summer 2016.

Q: Is the data behind your internal firewall?

A: Yes, only Central Bureau of Construction personnel can see the data.

Q: How long does it take Illinois to close out a project?

A: On average, a year starting from the district office processes.

3.2 Host State Presentation – MoDOT e-Construction Overview

Sarah Kleinschmit and Jeremy Kampeter with MoDOT provided an overview presentation on e-Construction practices in Missouri. MoDOT has a six person transportation commission, with director, chief engineer, and assistant chief engineer, all reporting to the commission. MoDOT also has several divisions that are responsible for providing support to seven districts across the State, and is a decentralized organization similar to IDOT. Industry also helped drive much of the innovation that is being applied by MoDOT in e-Construction. MoDOT began this process with electronic bidding (implemented in 2005), which had great industry support and allowed for simple elimination of late bids.

MoDOT is using SiteManager, ProjectWise, and SharePoint for online document storage and collaboration, and also uses mobile devices in the field as well as Bluebeam software for as-built plans. MoDOT also uses Excel frequently, with advanced applications for automated data processing and reporting (such as Excel to Oracle and Contractor Excel to Oracle). MoDOT is moving to a collaboration site using SharePoint (eProjects) as the document management system and will no longer use the server drives that are currently in use for file storage.

Q: Are your standard specifications in an app or PDF?

A: Both, on a laptop access is web-based, but another version is available as an e-book for iOS and Android devices.

Q: Does the MoDOT e-reader version have search and easier paging capability?

A: Yes, this version has all functionality to make it easier to find the section needed. The EPG also links directly to the specification and job special provision.

Q: Section 2.2 in the e-Construction specification: Certification statement for electronic payrolls – does the contractor submit that separately from the digital signature?

A: Yes, both are on the same form.

MoDOT is in production with SiteManager Construction and Materials, but not the LIMS module. MoDOT also uses AASHTOWare Preconstruction in web-based format.

Jeremy Kampeter, the Missouri Construction Management Systems Administrator, provided a presentation on the structure of MoDOT's AASHTOWare implementation. MoDOT manages approximately \$800 million annually in construction funding over about 420 projects awarded by contract. AASHTOWare Project and BidExpress are two primary software systems currently in use by MoDOT. IDOT has a \$2B annual construction program and manages approximately 900 active contracts. MoDOT uses in-house inspectors, and IDOT hires consultants for approximately half of all construction inspection activities.

With implementation of SiteManager, MoDOT has not experienced any unplanned downtime in 17 years of use. It was implemented in 1999 in anticipation of the potential year 2000 computer issues. Contractors do not currently have access to SiteManager. Network outages and viruses have impacted SiteManager to some extent, and MoDOT has approximately 700 users of the system and has processed 26,000 change orders. No contractor payments have ever been missed due to system error. No local projects are run through SiteManager, and MoDOT pays an annual license fee for unlimited users.

MoDOT originally implemented a different solution than SiteManager on a 2006 design-build project. The last design-build project was implemented through SiteManager.

For mobility and field application, Remote Desktop is an application currently used by MoDOT that originally targeted fixed positions such as asphalt plants. As contractors load Excel-based information into the system, an application searches for updated data and pulls that data directly into an Oracle database. MoDOT named this application Contractor Excel to Oracle (CRE2O) and also uses an Excel to Oracle (E2O) application for MoDOT inspector data input and processing. MoDOT is also evaluating mobile inspector for the daily work report entry. IDOT resident engineers store all data on their laptop.

MoDOT also has a robust contractor performance evaluation tool for prime contractors to assess issues – the system calculates a score for each contractor. MoDOT also uses the electronic database to capture information to evaluate environmental compliance (an internal storm water management tool). All data is stored in Oracle.

With any customizations to SiteManager, MoDOT is then responsible for ensuring that the customizations are compatible with the new releases of the software. A pre-customization workstation is also maintained and used to determine if errors are based on the original software or apply only to the customization, ensuring that the troubleshooting process is simple. MoDOT has one dedicated employee for all AASHTOWare products.

MoDOT also uses a product called COGNOS that is an agency wide web-based third party reporting application.

Q: Are the other modules within AASHTOWare such as PreConstruction, Civil Rights, SiteManager, BAMS/DSS, Estimator, and Expedite on separate license agreements?

A: MoDOT pays a separate license fee for SiteManager compared with these other modules. Each module has its own license fee.

Q: Does BidExpress interface with SiteManager?

A: Bid Express interfaces with PreConstruction.

Q: How do districts interface with the COGNOS reporting tool?

A: The system is web-based, and a link to COGNOS reporting is available on the internal website.

3.3 Demonstration of Host State e-Construction Technologies and Systems (SiteManager)

Jeremy Kampeter continued his presentation with a demonstration specific to the SiteManager software and custom reporting. The group asked questions during the detailed demonstration of SiteManager for contract administration. Discussion ensued on daily work reports and the general information provided benefit to IDOT as they finalize plans to implement document management software tools.

IDOT generates a weekly report of working day charges for the week and the contractor has an opportunity to review. MoDOT does not have working day contracts, but if the contractor closes a roadway within a specified time period, MoDOT can track those working days. The issue of completion day contracts versus working day contracts is a consideration in the efficiency of delivery. The future of e-Construction could also include weather data imported into software tools for analysis and backup documentation of available working days.

MoDOT's Excel to Oracle application takes a materials template and data inputted into excel and reads the files posted on the shared drive and adds data to the database. The system reviews files every five minutes to check for new data.

MoDOT's Contractor Reported Excel to Oracle is a similar system that allows contractors to edit formatted spreadsheet templates that can also be pulled into the database. Inspectors connect via VPN and upload daily work reports in Missouri (internal MoDOT inspectors).

Consultant designers can use their own software for plan development based on MoDOT CAD standards. Once the design is completed, consultants provide electronic deliverable files to MoDOT who then make those available for bid letting. They also provide signed and sealed plans in electronic format which are then housed in ProjectWise.

Q: Does MoDOT have relationships in SiteManager for all materials that are on a work item?

A: Yes, the system relates the material tests that are required for that particular item.

Q: If a contractor wants to request a time extension based on weather, how does MoDOT justify and grant time extensions?

A: MoDOT will often know beforehand, based on weather patterns for the month, that a contractor may ask for additional time based on working days available. If the contractor chooses not to start immediately after award and then rain events occur, MoDOT may deny a request for additional days on the contract.

MoDOT included an area within SiteManager for key dates, and this helps with final plan development. MoDOT tracks, through quarterly reports, data and metrics such as average number of days to complete final

plans as part of the performance measurement process. The goal is 120 days for finalization of projects, and MoDOT is currently at 160 days on average.

MoDOT uses the AASHTOWare Civil Rights Module for DBE utilization tracking and for payroll checking for audit support.

Q: Does MoDOT have an official contract diary that is the legal document that would be used in legal proceedings?

A: Yes, although MoDOT has not had a major legal issue with a project, and contractors do not have direct access to the system to obtain the information directly.

Q: Can a pay estimate be developed in draft format before submitted?

A: Yes, MoDOT has three approval levels for pay estimates and they are due on the 1st and 15th of each month. If there is a discrepancy prior to final approval, quantities can be added and the estimate can be edited and resubmitted. If the estimate is already approved and a quantity was missed, a new estimate can be created.

Q: How are batch material tests performed and data stored, such as for paint for pavement markings?

A: If the material certification is available for paint, for example, test results are stored and can be accessed in SiteManager to ensure that appropriate tests have been performed.

Q: Are weight tickets still going to be paper versions?

A: MoDOT is interested in implementation of electronic tickets for materials. Many deliveries are often made by independent trucking companies that are not part of the prime or subcontractor. One of the asphalt contractors in Illinois is using software to optimize cycle times. Start-up costs have been estimated at \$60,000.

3.4 Collaborative Project Sites – ProjectWise and SharePoint Demonstrations

Chris Schwandtner, MoDOT's ProjectWise administrator, presented on workflow processes for document approvals and storage. Prior to 2007, electronic design files were printed, signed, and sealed. Plans were shipped to Central Office where they were scanned into electronic files. These files were printed and plans distributed to contractors.

MoDOT began a project in early 2006 to implement the ProjectWise electronic file system to convert paper processes to electronic. Users design their job using MicroStation/Geopak in addition to filling out the file attribute dialog within ProjectWise. They also generate a PDF file of the electronic plan sheet that is signed and sealed by the Project Manager (using Adobe Reader).

Part of the design for the electronic system included automatically created PDF files that are sealed electronically in the Adobe software. MoDOT manages several million files with nearly 2 terabytes of data within ProjectWise, and each district has their own ProjectWise server. One application server is used for all the data housed within ProjectWise.

Users of ProjectWise can request that a PDF file be generated (a custom application titled "Make PDF Request") using Interplot software from Bentley. The engineering policy group created a file naming convention that is used, and if users do not follow the convention the file is rejected. This application allows users to generate a PDF file drawing from multiple drawing file sources, and users can turn layers on and off

to create different views. Adobe LiveCycle Reader enables functions that allow Acrobat Reader to be used for signing electronically.

Seals and signatures are controlled with public/private key encryption, and project managers have control of all files associated with that project. An electronic seal is used for both professional engineer seals and professional land surveyor seals, and the images can be added to the contract plans. MoDOT is a self-validating organization, and seals last five years before the files have to be regenerated.

Primary benefits realized by MoDOT include an enhanced managed document environment, reduction in printing costs, time savings from not having to ship plan sheets between districts, headquarters, and contractors, and greater collaboration. IDOT uses ProjectWise to manage the CADD files and other project development correspondence, although State statute requires a wet ink seal on plans.

The plan for both MoDOT and IDOT is to incorporate 3D engineered models into construction. Construction and CAD offices at MoDOT are collaborating on implementation of the 3D models.

Wendy Brooks with the St. Louis District of MoDOT provided a demonstration of two SharePoint sites, one internal to MoDOT (eProjects) and one that allows external access (MoDOT Partner Site). The Partner Site allows MoDOT to have secure external access and standardizes contractor document storage. There is no financial impact for the contractor in setup or use of this site.

The prime contractor may assign site access to materials suppliers and others as needed, and the process is outlined early on in the preconstruction meeting. MoDOT employees have read-only access to information, and FHWA Missouri Division Office personnel can also access MoDOT files. A group from various offices within MoDOT met to discuss the original design and folder structure for the SharePoint site.

eProjects is the internal site that MoDOT uses to collaborate and eliminate paper. Having senior management support is important in implementation of one single location for all documentation. This process started in May 2015, and all districts and program delivery divisions are represented in the responsible collaboration group. Collaboration occurs using video conference technology to allow users to participate virtually in the collaboration group meetings. MoDOT also created a frequently asked questions section of the eProjects site to maximize the effectiveness of the SharePoint tool. In May 2016, MoDOT plans to use a train-the-trainer concept for rolling out eProjects. In June 2016 the program delivery users will be trained, and beginning July 1, MoDOT will manage all change order documentation on eProjects instead of on internal shared drives.

Q: What proportion of MoDOT plans are created by consultants?

A: About 20%-30%; they are submitted in a pre-established folder along with validation certificates – the consultant is the engineer of record for the plans.

Q: Is Bluebeam integrated into ProjectWise?

A: MoDOT is currently piloting that application in construction for as-builts.

Q: Do you manage any other reports or documents in ProjectWise?

A: Some districts use ProjectWise as the overall electronic filing cabinet.

Q: Do contractors use the fillable PDFs or write out the reports?

A: Both, they may use the fillable form and upload directly to SharePoint.

Q: How did you evaluate using SharePoint instead of another tool?

A: Missouri is a SharePoint State and that solution was already in place, allowing for easy application to construction.

Q: How are deletions handled to ensure no files are deleted in error?

A: There are two recycle bins in SharePoint, and users can verify the deletion in the recycle bin as a backup.

3.5 e-Construction Mobile Devices

Jonathan Silver, a senior inspector with MoDOT, provided a presentation and demonstration on the use of mobile devices. MoDOT is using tablet devices in the field with hotspots. Some inspectors have MoDOT-provided devices such as cell phones, while personal device users are provided with a stipend on a monthly basis. The Dell Venue is the tablet in use by MoDOT. They have tested several types of devices and operating platforms.

The tablets have proven very useful in the field for applications such as Bluebeam for markups on drawings. Cell phones (MoDOT provides iPhones) are also used as hotspots to connect to the internet. The apps available on the Windows-based devices are not as prevalent compared with iPad and Android devices. The screen size on the Windows tablet is also a limitation, and the tablet only opens to a certain extent when the keyboard is added. SiteManager worked with the iPad; however, a third party app was needed to access MoDOT systems. When users are connected to their phones via hotspot, they can also make and receive phone calls.

MoDOT also has a mobile website for downloading and converting GPS data to log miles. For example, for sign locations, users stand next to the sign and click the button and the app will locate you so that you can add coordinates to the sign location.

Q: Do all resident engineers and inspectors get assigned a device?

A: Yes, the device is the only device each person has (no additional desktop or laptop). Almost all MoDOT inspectors have tablet devices. Some resident engineers still have laptops.

Q: How does MoDOT handle areas outside of Wi-Fi coverage?

A: Hand written notes or taking notes on the tablet offline with connection later when back at the office are both options. SiteManager has a tool for taking notes offline also, as it runs from each tablet device.

Q: What drove MoDOT to decide on the Dell tablets as opposed to something else?

A: Years ago Dell was the low bid on the hardware provider contract initially, so this created a venue to procure the tablet devices.

Representatives from FHWA also presented on and discussed a current pilot project to evaluate use of tablet devices in the FHWA Division Offices. Currently, Florida, Michigan, and Iowa Division Offices are using iPads, and Texas and Utah Division Offices are using the Surface Pro. The pilot is also expanding to include Surface Pro use in Missouri, North Carolina, Pennsylvania, Virginia, and West Virginia. The FHWA Michigan Division Office has reported benefits from using the iPad in the field – a device that also matches devices in use by Michigan DOT. Access to systems has not been an issue, but the iPad lacks a configuration for Personal Identity Verification (PIV) Cards due to restrictions on use of wireless card readers by USDOT. Participants discussed the pros and cons of each device, including built in cellular on the iPad, the need for a

separate Jetpack with the Surface Pro, GPS configurations on each, and apps available for each type of device. Downloading plan sets prior to field visits is a primary time and paper saving activity using the tablet, and users can also get real-time access to specifications and other documentation without making additional trips to an office location.

3.6 Digital Signatures

Sarah Kleinschmit with MoDOT provided a presentation on digital signature use in Missouri. Contractors are required to obtain a digital signature for the purposes of bidding on MoDOT projects, and this was the premise for application of digital signatures within MoDOT. Contractors must also sign an agreement to digitally sign BidExpress documents. In July 2015, MoDOT mandated digital signatures via the e-Construction Job Special Provision. Certain documentation still needs to be notarized and therefore is not required to be signed digitally. MoDOT decided to be a self-verifying agency as opposed to using a third party verification process.

Contractors are required to submit (export) their digital signature certificate (.fdf file) to a specific email address, and MoDOT currently has 391 active contractor digital signature certificates on file. The process is the same for applying a digital signature through Bluebeam Revu, only the export file has a different ending (.cer file). Once workflows are completed, documents are exchanged by email for final digital signatures. MoDOT anticipates placing signed/final documents on the SharePoint site in the future.

MoDOT worked out a solution to make the electronic engineering seal the same size as the original PE seal that is placed in ink. One software vendor assisted with this process.

Digital signatures are also applied to change orders through documents on the network drive, and this process has significantly reduced the number of days necessary for approval of change orders including FHWA approvals. FHWA has the ability to approve documents using a toggle within SiteManager, and the digital signature process is also applied. FHWA Missouri Division representatives log in as a MoDOT employee to gain access.

MoDOT purchased Bluebeam maintenance for a small annual fee per computer to assist with any issues that arise. This software is being used by inspectors to mark-up final plans in PDF format instead of going back to original CAD files to make changes. MoDOT blocks out original engineering seals with a statement that the as-built should not be considered a certified document in this format. Resident engineers are not signing and sealing as-built plans, rather they are verifying them. With engineering changes, documents are recreated in the design division and re-sealed. Bluebeam also has options for allowing changes after certification. If a document is signed in Adobe and then the file is opened in Bluebeam, the digital signature does not show up.

For change orders, IDOT does not require a contractor's signature. Once approved internally by IDOT, approval is sent to the contractor and work is initiated. Certified payroll submittals are a high risk item in audits of prior projects for IDOT.

Q: What documents do you sign electronically?

A: Asphalt mixes are common items where digital signature is applied.

Q: Does someone at MoDOT verify internal digital signatures?

A: No, mainly the process is to verify signatures from private parties. Construction liaisons perform these checks.

Q: With certified payrolls submitted by contractors, do they sign the certification statement electronically?

A: Yes. As part of the contract administration, MoDOT asks for a list of users and what they will sign prior to work starting. This ensures that the appropriate items are signed by the appropriate people.

Appendix A – e-Construction Peer Exchange Agenda



Illinois/Missouri e-Construction Peer Exchange

St. Louis TMC – Room 207
14301 South Outer 40 Road
Town and Country, MO 63017



April 26, 2016 Agenda

Time	Topic	Presenters / Facilitators
8:00am – 8:15am	Welcoming Remarks and Introductions	Jen Harper, Missouri DOT Tim Kell, Illinois DOT Rob Fijol, FHWA
8:15am – 8:30am	Peer Exchange Background and Overview	Tim Luttrell, Leidos Tom Zagorski, Michael Baker International
8:30am – 9:00am	Illinois DOT e-Construction Plans Compared to Current Practice	Tim Kell, Illinois DOT
9:00am – 9:30am	Missouri e-Construction Overview	Sarah Kleinschmit & Jeremy Kampeter, Missouri DOT
9:30am – 10:15am	Demonstration of Host State e-Construction Technologies and Systems – SiteManager	Jeremy Kampeter, Missouri DOT
10:15am – 10:30am	Break	
10:30am – 11:45am	SiteManager (continued) and System Support Processes	Jeremy Kampeter, Missouri DOT
11:45am – 1:00pm	Lunch	
1:00pm – 2:00pm	Collaborative Project Sites – ProjectWise and SharePoint Demonstrations	Wendy Brooks and Christian Schwandtner, Missouri DOT
2:00 pm – 3:00pm	Use of Mobile Devices in Missouri (iPads and Windows Tablets) and FHWA Division Office Pilot	Jonathan Silver, Missouri DOT FHWA/All
3:00pm – 3:15pm	Break	
3:15pm – 4:15pm	Digital Signatures and Workflows	Sarah Kleinschmit, Missouri DOT
4:15pm – 4:30pm	Discussion on Takeaways for Implementation	Tom Zagorski, Michael Baker International Tim Luttrell, Leidos
4:30pm	Adjourn	



Appendix B – e-Construction Peer Exchange Roster

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Appendix C – List of Standard Apps in use on MoDOT Tablet Devices and Smartphones

Faster Scan+ - This app will take a picture of documents in the field, and then turn them into pdf files. It has been useful when the contractor has paperwork in the field, but only has one copy. This way we can scan it and save it.

Basic GPS - This app will give me latitude/longitude in the field.

AnyConnect - This app gives us connection to MoDOT information through a VPN connection. This is the same program that is installed on MoDOT computers in order to VPN.

PDF Expert - This is a big one for us. With the transfer to fillable pdf forms, your standard reader on the phone will not pick up form fields or digital signatures. PDF Expert allows us to do this, plus markup documents and many other kinds of editing on our phones.

WPS Office – Used for reviewing and editing Microsoft Word documents and Excel sheets. Microsoft offers Word and Excel apps as well, but this may help when users do not have an Office 365 account.

Measure My Land – Similar to Google Earth, this app will actually allow you to measure land. We can easily find open acreage and any other info we may need.

RD Client - We use this to Remote Desktop into the Terminal Services client. This is how we can access SiteManager in the fields on our phones. We can also access network drives this way.

Google Earth – Some use Google Earth instead of Google Maps because of Street View. Being able to see what the street view is can be handy, especially when you are establishing conditions prior to construction.

Audit Bricks - This program will compile punch list items, and then publish them all into a pdf file. It has been useful when walking through a semi-final review and just marking down the punch list items. You can also add photos as well. We have also thought about using it for plan reviews, since it will publish them all together.

Mobile Log Finder - By saving the link on your phone, you can then use your phone to find log miles in the field. Now the contractors can know and report work based off of our log mile system.

<http://www6.modot.mo.gov/mobilelogfinder>