e-Construction
PEER-TO-PEER EXCHANGE

Summary Report

Arkansas State Highway and Transportation Department and Nebraska Department of Roads

July 26-27, 2016
Little Rock, AR

NDOR
Nebraska
Department of Roads

U.S. Department of Transportation
Federal Highway Administration

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1. Background

The Arkansas State Highway and Transportation Department (AHTD) hosted a peer exchange with the Nebraska Department of Roads (NDOR) in Little Rock, Arkansas on July 26–27, 2016. The peer exchange focused on e-Construction, which is defined as paperless construction administration delivery processes that include electronic submission of construction documentation by stakeholders, electronic document routing and approvals (e-signatures and digital signatures), and digital management of construction documentation in a secure environment that allows distribution to authorized project stakeholders through mobile devices. The Federal Highway Administration (FHWA) sponsored the event, and representatives from FHWA Headquarters, Resource Center, and each participating State's Division Office participated in the event. Contractor associations also provided private sector perspectives on e-Construction challenges and benefits.

The peer exchange began with introductory presentations from each State (see Appendix A for the full agenda), including NDOR's current use of AASHTOWare software and a project collaboration tool named OnBase, which is used by multiple agencies within Nebraska State government under an enterprise-wide contract. AHTD presented on accomplishments since a 2015 peer exchange with West Virginia Division of Highways, along with software tools in use including DocExpress, SiteManager, and a custom-developed SiteManager reporting tool. The first day concluded with a discussion on Information Technology (IT) security. The second day included discussion on electronic devices for field inspection and documentation, including Windows-based and iOS tablets with and without built-in cellular connectivity. The peer exchange concluded with discussion on use of e-Construction data and information for enterprise-wide asset management along with key concepts for implementation and the future direction of e-Construction in Arkansas and Nebraska. NDOR is developing a concept for capturing and tracking data on assets such as signs and culverts to allow inspectors real-time access to attributes that will help manage infrastructure maintenance.

The event also included a presentation and discussion session on a current FHWA pilot project to deploy mobile devices in 10 FHWA Division Offices. The purpose of the pilot project is to assist FHWA engineers and inspectors by enhancing e-Construction efficiencies and increasing access to real-time data in the field. In addition, this pilot project ensures that Division Offices are able to also apply e-Construction in conjunction with the evolving business practices of their State DOT partners. FHWA users are piloting the iPad Air 2 (Florida, Iowa, and Michigan) and the Surface Pro 3 (Missouri, North Carolina, Pennsylvania, Texas, Utah, Virginia, and West Virginia).

This peer exchange was the eighth in a series designed to assist States with implementation while enabling peers to network and share information across State departments of transportation in a relatively small group setting. The list of attendees is provided as an appendix to this document to promote further networking.

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

For more information, please contact:

Bryan Cawley, P.E.
Construction Management Team Leader
Office of Infrastructure, FHWA
202-366-1333
bryan.cawley@dot.gov

Kathryn Weisner, P.E.
Construction & Contract Administration Engineer
FHWA Resource Center
202-823-2267
kathryn.weisner@dot.gov

2. e-Construction Implementation – Key Peer Exchange Findings

The peer exchange produced several findings identified through group roundtable discussions. The following sections outline the items that were 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, website links are provided for some of the practices currently in use by the agencies. AHTD also shared presentations given at the peer exchange.

Document management systems encompass one key component of any e-Construction program and provide for access to all key stakeholders, bringing about a philosophy of transparency and single source of truth for project documentation. This was the starting point for NDOR and can serve as a first implementation step for other State agencies interested moving toward paperless project delivery. AHTD uses DocExpress and also developed guidelines for use of the software tool on projects. NDOR uses a software tool named OnBase that was procured through an enterprise-wide license for the State of Nebraska. Both tools are being used to house all project-related construction documentation and provide contractor access to applicable information in a secure environment.

> Links to DocExpress, OnBase, and e-Builder software tools:
> http://www.docexpress.com
> http://www.onbase.com
> http://www.ebuilder.net
>
> AHTD shared a document titled "*Guidelines for Use of DocExpress on AHTD Projects*"
>
> Link to Hyland OnBase software tools:
> https://www.onbase.com/
>
> Link to NDOR guidelines on consultant access to OnBase:
> http://www.transportation.nebraska.gov/roadway-design/pdfs/CONSULTANT%20ACCESS%20TO%20ONBASE.pdf

AHTD has agreements with service providers where they allow **installation of fiber optic lines along the highway network** for free in exchange for use of the communications infrastructure. Additionally, AHTD developed a **special provision for contractor-provided broadband internet service** at field office locations.

> Link to AHTD special provisions for:
> - Broadband internet service for asphalt concrete plant (page 1)
> - Broadband internet service for field office (page 2)
> - Mandatory use of internet bidding (page 40)
>
> ftp://www.ahtd.state.ar.us/Outgoing/Roadway/CA0907/CA0907%2090%%20SPs%20comments%207-23-14.pdf

Digital signatures provide for time savings and efficiencies in processing change orders and contract documentation (construction contracts use fully electronic signatures). AHTD manages change orders electronically and plans to migrate to full electronic approval of change orders by the end of 2016. NDOR is using DocuSign for approvals on some types of agreements. Workflow processes also include electronic approval of an item based on log-in information provided by the user (for consultant invoices to NDOR).

AHTD has reduced contractor change order processing times significantly through the use of electronic signatures and also applies electronic approvals through SiteManager. A future AHTD enhancement includes adding an electronic signature capability from the surety bond provider on change orders.

> Link to Nebraska electronic signature authorization documentation and forms:
> http://www.transportation.nebraska.gov/rfp/downloads/pdf/docusign-esaa.pdf
> http://www.transportation.nebraska.gov/rfp/downloads/pdf/docusign-auth-list.pdf

> Link to DocuSign electronic and digital signature software:
> http://www.docusign.com

e-Construction philosophies can be designed to capture a wealth of data on assets for use in the future. For example, capturing information in the field for as-builts and documentation of utilities (depths, locations, etc.) while trenches are still open can be an efficient way of collecting this information. AHTD and NDOR provided a vision for the concept of Civil Integrated Management (CIM) and enterprise-wide asset management that includes enhanced information capture and process automation.

> The group shared a presentation by Michigan DOT on the Transportation Asset Management System (TAMS) presented at a recent peer exchange.

Electronic devices such as tablets and smart phones can be used in the field to communicate with stakeholders, document information, and access e-Construction libraries in real-time. AHTD is piloting the use of a Windows-based tablet that has built-in cellular connectivity. The Surface Pro tablet can be used with a hotspot to connect to e-Construction systems. NDOR tested tablet devices with hotspots on a limited basis while developing a plan for purchasing smart phones for all inspectors. Contractors in Arkansas primarily use smart phones to conduct business. FHWA is piloting the use of the iPad and Surface Pro.

Some State agencies are using **Cloud service providers to store data**, and the Federal Government provides guidance on how to participate in and understand the Federal Risk and Authorization Management Program (FedRAMP).

> Link to FedRAMP Information and List of Compliant Cloud Systems:
> https://www.fedramp.gov/marketplace/compliant-systems/

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). As noted in Section 1, 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.

Emanuel Banks, Deputy Director and Chief Engineer with AHTD, kicked off the introductory session with an overview on the Arkansas SHTD. AHTD is the third largest agency in the State and maintains over 16,000 centerline miles of highway and over 7,000 bridges. AHTD is a centralized organization with 10 district offices and also has a State Highway Commission. Arkansas voters recently approved a one-half cent sales tax to fund construction and maintenance needs. The primary challenge for AHTD is adequately funding infrastructure needs, which outpace current revenues. AHTD is embracing e-Construction technologies for managing and delivering projects from the early stages to final project closeout as a cost-saving measure.

Kevin Thornton, Assistant Chief Engineer for Planning, provided a presentation on the evolution of e-Construction at AHTD. Staff members from Administration, FHWA, and computer services are three key stakeholders that must be engaged to implement e-Construction efficiently. AHTD implemented SiteManager as one of the first steps in use of e-Construction technologies. An example of the digital philosophy from AHTD is the use of SiteManager to provide electronic "approvals" that do not require a report to be generated and digital signature applied to it, such as with a contractor pay estimate report. This approach allows for real-time data and information to be used by relying on the database of current information. The digital reporting process has created efficiencies in the audit process as well.

Angel Correa, Division Administrator with FHWA's Arkansas Division, presented on project efficiencies realized in Arkansas using e-Construction. Implementing e-Construction is also allowing States to re-engineer processes to provide improvements while embracing the technology. Arkansas has 9 projects being delivered paperless currently as well as five additional paperless projects planned for the near future. Routine approvals are being implemented electronically by the FHWA Arkansas Division in coordination with AHTD. E-Construction was very favorably voted on by States for continuation into Every Day Counts 4 (EDC-4).

Devin Townsend, NDOR Assistant Materials Engineer and manager of AASHTOWare Project, discussed the evolution of paperless processes in Nebraska. Officially, the e-Construction initiative in Nebraska began in 2015 but NDOR has been using AASHTOWare products since the 1980s. NDOR has defined the first phase of the e-Construction implementation as electronic document management, with expansion of implementation to occur in phases. NDOR is a centralized organization with eight districts that implement construction projects and maintenance activities. The field offices have embraced e-Construction. In Arkansas, a construction memorandum was issued that allows contractors to submit all documentation to AHTD electronically. Leadership meetings are held (leadership circle) between AHTD and the Associated General Contractors of America – Arkansas Chapter about implementation of technologies. AHTD also added two contractor representatives to the e-Construction team that also participated in the first peer exchange. NDOR is planning to engage the industry at an upcoming meeting, and contractors have been bidding electronically through AASHTOWare and the process has been well received by industry. NDOR is also forming a committee with AGC representation to allow for a user forum for implementation of electronic systems. NDOR also has consultant inspectors that use SiteManager for electronic reporting. Consultants have been primarily used on local projects, and NDOR has one project where consultants are inspecting State projects. In Arkansas, local public agency projects are still paper-based. AHTD is discussing the potential to provide tools and training for application of technologies to LPA projects. NDOR is writing a manual for

implementation of alternative contracting techniques such as design-build projects and is planning to implement a design-build project in the near future.

Q: Is the goal to have environmental permits approved prior to implementation of the design-build project?
A: Yes, a footprint will be provided to the design-builder but there will be freedom to go outside of the footprint. If the design-builder has an innovative approach that exceeds the footprint, then environmental permits would have to be obtained outside of the AHTD work performed already.

3.1 Host State Presentation – AHTD e-Construction Overview

Ben Browning with AHTD presented on implementation of e-Construction and activities since the 2015 peer exchange with West Virginia. AHTD uses Expedite (an AASHTOWare product) and Bid Express, and electronic bidding was one of the first elements implemented (first accepted electronic bidding in 2011). A report is produced directly from the data, and bids are read as required by law, although participants can see the bids on the screen instantaneously. This allows for faster contract award. The low bid is also compared with the original engineer's estimate so that a full analysis of the bid process can be made within minutes of the bid reading. NDOR allows a paper option for bids but also accepts electronic bids. This allows smaller contractors to provide paper bids, although most contractors prefer the electronic process. There is also a validation process through BidExpress that provides verification to the contractor that the bid was submitted.

AHTD is an AASHTOWare agency and uses SiteManager for construction records management. Both AHTD and NDOR use the SiteManager Materials Module, and NDOR uses a Laboratory Information Management Systems (LIMS). AHTD developed internal programs for reporting that are Microsoft Access-based tools. NDOR implemented Preconstruction and developed internal reporting code for generating reports. Project documents generated on paper outside of SiteManager are captured in e-Builder and DocExpress. The Connecting Arkansas Program is being administered by a consultant and e-Builder is being used for this $1.8 billion program. DocExpress is being piloted internally at AHTD for projects outside the Connecting Arkansas Program. This system allows application of digital signatures on construction contract documents from leadership with the department, with plans to expand use by the end of 2016.

Since the 2015 peer exchange, Arkansas has become a lead State by expanding use of DocExpress—implementing electronic approval of construction pay estimates—and has expanded use of AASHTOWare including the Preconstruction module.

Q: Have you been able to quantify the time savings from bid tabulation to notice to proceed?
A: Time savings have been recognized mostly in the time between project award and contract execution with the time being reduced from taking up to four weeks to now often being accomplished in only a few days. This time savings is due to the use of electronic collaboration in contract development and electronic approval of contracts. While the time between bid tabulation and project award has not necessarily been reduced by electronic bidding, the burden of bid processing for the purpose of award has been greatly reduced.

Q: How do you balance the enterprise-wide solutions with the direct applications such as a part of the e-Construction process?
A: AHTD has looked at ProjectWise as an application, but the electronic signature capability was potentially an issue. Given that it has more uses than just the signature portion, AHTD is looking into the application for project collaboration. DocExpress has a feature that exports all information for use. NDOR has a document management system that is currently applied throughout State government as a transition from a previous

proprietary system. The new system is very robust and highly configurable and requires resources and support to implement. One challenge lies in getting users and system administrators proficient with use of the new system due to complexity of the advanced applications.

Q: Is NDOR using OnBase for design and engineering files?
A: No, a consultant is assisting with the implementation of OnBase, and NDOR uses ProjectWise for CADD file storage (working documents) while final deliverables will be stored in OnBase.

3.2 Arkansas Construction Records Documentation System

Ben Browning and Jamey Wilhite presented on legacy systems and the implementation of software for document management in Arkansas. AHTD decided to implement AASHTOWare Project to include the latest version of existing AASHTOWare software such as SiteManager. A user group was established that provides lessons learned, and a phased approached was designed since Project will interface with the older systems in use. AHTD is planning to transition to AASHTOWare Civil Rights and Labor in the near future.

AHTD uses Microsoft Access tools such as SiteManager Access Reports System (SARS) that pulls data from SiteManager and generates custom reports. Reports are exported in PDF and used for Freedom of Information Act requests and for internal reporting. The SARS system is a live connection to the Oracle database, with an update feature that allows for local computers to always run the most updated version of SARS. The Change Order Generation System (COGS) automates the process for developing a change order that provides for consistency in formation and allows validation checks to ensure that item information entered into SiteManager is valid. The change order module in SiteManager did not allow for validation or provide all of the information needed to support the process. The decision was made to develop COGS instead of customizing SiteManager, and this allowed for consistency in the system even after SiteManager upgrades took effect.

Online Ticket Tracking and Reporting System (OTTRS) is an AHTD system designed to track asphalt tickets. The information and data on each ticket is manually entered into a database. NDOR develops a summary and keeps the paper tickets as an archive. Daily summary of scale weights is an Excel form used by NDOR to summarize the daily information from each ticket. Often there are multiple tickets for the same information. There may be discrepancies in the final ticket quantities as recorded by the contractors and the owner-agency. This is an issue after the fact in reconciling ticket quantities for payment. Bar code technology may be a solution if plant technology can also be changed. Solutions may also be equipment-specific, and this may be resource intensive; for example, asphalt binder test equipment linkages to SiteManager would be equipment model-specific. What drives this issue is the need for a definition of the original source document – a scan or picture should be just as good as the original assuming the document has the correct information.

Prior to the recent implementation of e-Construction technologies, AHTD audit findings were showing discrepancies on projects. During final review for a project, every entry is checked, including every computation, and this required resources to complete (this review occurred on 100 percent of projects, amounting to more than 200 per year). The Daily Work Report (DWR) templates in SiteManager are used to simplify and streamline the audit process. AHTD and West Virginia Department of Highways exchanged daily report templates after the 2015 peer exchange. NDOR has Excel sheets that are used instead of the SiteManager Daily Work Reports Template. AHTD has a 12-person group reviewing projects and developing final estimates. In one specific example, AHTD evaluated plan quantities versus paid quantities of asphalt, and the custom reporting tool allowed for detailed analysis by magnitude of cost to show statewide trends.

PowerBuilder files are used by SiteManager and customizations are compiled from source code to client computers, and NDOR deploys centrally located changes to client machines.

Q: Why wasn't SiteManager used for ticket tracking like OTTRS?
A: For the ease of the end user of the information. By using Access, reviewers can find data on mix designs for that project based on job number, that way the only end user input is for the ticket information.

Q: Is AHTD generating any new systems for design-build compared with traditional unit prices in design-bid-build?
A: AHTD is not planning to use SiteManager for a breakdown of detailed pay items. An independent firm is handling quality control, and AHTD will require a quality management process (frequency of testing, etc.) and the design-builder will track quantities in a way that is consistent with AHTD guidelines. AASHTOWare developers are researching how to administer design-build projects using SiteManager.

Q: NDOR has change orders signed off by the contractor and FHWA, how will AHTD provide access?
A: AHTD is only requesting a letter from the contractor agreeing to a price for the change. FHWA does have access through Virtual Private Network to log in and see change order information and that will allow for approvals in the future.

Q: Is the change order process with the contractor still a paper exchange?
A: AHTD negotiates through email and meetings, and when agreement is finalized the contractor develops an official correspondence that shows agreement to terms. AHTD is accepting this correspondence electronically. Verbal approval is given to allow work to begin. On new contract items using supplemental agreements, they have to be approved through the Surety. Change orders are typically resolved quickly.

Q: Having one location for every file is important when archiving instead of having multiple copies of the same file on the system. How would you maintain version control?
A: In setting up DocExpress, if the document originates from a database, then the data is the original source for the information, not the report. As long as the data is secure, locked, and protected, the data is the original source. Changes are made to the database, not the paper report generated previously.

3.3 Collaborative Project Sites – DocExpress

Jamey Wilhite presented on AHTD's use of collaborative project sites in Arkansas. The AHTD Director wanted to be able to easily sign documents using a system that could be implemented relatively quickly, and this was a major factor in the decision on which software tool to use. This is the first e-Construction document management system and is currently being piloted by AHTD. DocExpress and BidExpress rely on the same digital identification credentials and therefore AHTD found that implementation of DocExpress would allow for ease of use by contractors. During the pilot, the software was implemented at a reduced cost per contract, and AHTD is currently paying an annual fee for maintaining 300-400 active contracts. There is no cost to the contractor for access to DocExpress, and all documentation must come from the prime contractor who has access to a limited number of document folders in the system. AHTD plans to add work order issuance processes to DocExpress.

AHTD is not currently using DocExpress for storing plan documents. They are stored on the website pre-bid, and AHTD has moved to electronic plans and proposals. AHTD does not require as-built drawings to be developed. For NDOR, the final plans from the previous project are the starting point for a future project in the same location.

Q: Is the electronic plan a full sized copy of the scanned plan?
A: Yes, it is a wet signed set of plans scanned in. AHTD is working with the professional engineering licensing board to develop a true set of electronic plans.

Q: Will other disciplines within the agency use DocExpress?
A: So far only the Construction Division is using DocExpress.

3.4   IT Security Solutions, Firewalls, and Outside Access

Bryan Stewart, Sidney Foggo, and Raymond Leung with AHTD presented on wired and wireless internet connectivity and policies. AHTD has a fiber optic backbone that covers the main corridors across the State, with 23 resident engineer offices connected to the fiber network. Six offices are on DSL, and three are using 802.11 wireless bridges. Security issues have been addressed and field office connectivity has improved greatly over the past few years. Other than FHWA, consultants, and contractors, no other entities access AHTD systems. Local agencies handle most project documentation on paper. Consultant resident engineer offices staff their offices the same as AHTD and get user accounts for access. The vast majority of NDOR field offices have internet connections, although speed has been an issue for some offices. NDOR contracts with local internet providers and does not have a fiber network in the State, but just upgraded to DSL for some locations. Network latency has been an issue for AHTD even with higher speeds, and latency was included in the specification. AHTD requires a physical connection with static IP address, while the contractor will often set up a wireless network in the field office.

Q: Are these corridors where AHTD paid for the installation?
A: No, the providers are allowed to use the right of way and in exchange for that the department gets dark fiber lines with maintenance performed by the utility companies.

Q: For job trailer connectivity, the contractor provides that service?
A: Yes, if it is available.

Q: Are other State agencies also involved in the negotiations?
A: This is for highway use only for now.

Q: What tablet devices are being used in Arkansas?
A: Laptops primarily in the field. A pilot project is planned to replace the laptop with tablets in the field.

Q: Does AHTD maintain servers directly?
A: Yes, storage space is adequate, and the largest use of it is for a program that captures photo and location information for signage, curves, striping, cracking, rutting, etc. Photos are captured every five meters to produce a video of the route, thereby producing large amounts of data for assessment.

3.5   e-Construction Mobile Devices

Jamey Wilhite and Ben Browning with AHTD and Jim Barton with the Arkansas AGC Chapter presented on mobile device use in Arkansas. In 2001, AHTD identified a need to connect laptop computers in the field with SiteManager, and now every inspector in the field has a laptop. Early on this connection consisted of a dial-up speed connection. Dell Venue tablets have been tested over the last few years, but there are concerns

with laptop replacement and the cost is similar to laptops. The Dell Latitude is a newer device being tested by AHTD as a potential laptop replacement and is a Windows 10 device. A STIC Grant allowed AHTD to purchase 60 devices.

NDOR has a policy of one device per person, and personnel are working to get smart phones for each inspector to provide connectivity in the field. All field personnel at NDOR have laptops currently also. Mechanics in one NDOR district have ruggedized tablets that are being used to diagnose mechanical problems on vehicles. Another question arose as to the most appropriate program for as-builts, which may not require an extensive CADD application. The process could potentially benefit from a simpler PDF editing tool. Also, tablet devices do not lend themselves to using the more extensive CADD applications. Skype for Business also has similar functionality to Facetime for the iPad, and NDOR uses Skype for Business. NDOR also requires employees to sign a release allowing wiping of a personal smart phone if used for business email.

Geographically, contractors in Arkansas have challenges with broadband access. AHTD has a special provision for the contractor to provide internet access, and when an inspector needs access, the project office may not be in an easily and quickly accessible location. It may take 4 to 6 weeks getting the internet access set up. One issue is that with a change order and project duration extension, the contractor does not get reimbursed for the additional time providing internet access. One contractor is using primarily phones and cellular cards for laptops for communication, being completely cellular in communication design.

Arkansas contractors have embraced e-Construction technology, especially electronic bidding. Initially, contractors were used to filling out paper bids and had some concerns about technology failure, but those concerns have subsided. One of the key benefits is transparency—the ability of contractors to see where a change order is in the approval process, for example. Some contractors have access to DocExpress as part of pilot projects to integrate contractors into e-Construction. Some correspondence is stored in email archives until an official document is created and becomes part of the project record and files. Another important question lies in what types of correspondence need to be captured in DocExpress and what should be kept in email archives. One example is approval of mix designs – some Resident Engineers require formal correspondence, while others may approve an email that requests transfer of a mix design to another project. Contractors may also print the approval and store it in project files or this can happen electronically. AHTD uses a general special provision for the pilot projects for application of e-Construction.

All supplemental agreement pay items have to be approved by the contractor, the department, and the Surety. This process is expected to become shorter with automation that allows electronic signatures from the Surety. Contractors see this as one of the greatest benefits of e-Construction, and AHTD is planning to implement this process via DocExpress. AHTD is also accepting more electronic subcontract documents instead of paper copies.

NDOR set up OnBase, which is similar to DocExpress with drawers and folders. NDOR is designing with modeling software, and 3D Engineered Models (for new or reconstruction type projects) are being provided to contracts at the project advertising stage. NDOR is performing design using modeling software for overlay projects, and improvements to the centerline survey will ensure the accuracy needed for potential further use in the field.

Another issue is complacency with technology. Users of new technology still need to verify and check to make sure the technology is providing accurate information.

Q: What are the conditions of the STIC Grant?

A: The STIC program has been used to help defray the cost of new technology. Typically STIC funds are used for writing manuals or implementing a process, but several States have been granted funds for technology application for e-Construction.

Q: Have you considered a "bring your own device" policy with a stipend?
A: In Arkansas, there are some issues including potential for taxing the benefit provided. When using a phone for personal calls, that is a benefit provided and potentially taxable. For personal calls on an AHTD device, employees reimburse the State at a pre-determined rate per minute.

Q: Are contractors typically duplicating the documents, or will the DocExpress records be a big part of the project file?
A: Right now one pilot project is using duplicate documents.

Q: What technologies do contractors see as providing future benefit for e-Construction?
A: The primary technology in use is the phone. The smart phone allows for communication, and employees are able to download project data and documents. It is also used for communication with Resident Engineers and inspectors. Some employees use laptops in the field for data collection and documentation.

3.6 e-Construction Software Demonstration

Devin Townsend with NDOR provided a demonstration of OnBase and folder structures associated with projects. The system was designed with a focus on records retention and associated schedules for when documents could be removed from the system. The retention period starts at final payment on the contract, and the retention period is 10 years. The official retention period, as approved by the Nebraska Secretary of State, is still under review. FHWA may audit a project from final payment through 3 years after the last action taken on a project.

NDOR has a naming convention that associates each document with the owner (i.e. construction) and also provides for the naming of the document relative to its contents. Hyland printer is a tool that allows users to populate meta-data and upload the document to the system, eliminating the need to print to PDF. The system also provides links that can be emailed to other users to share documents, or the document can be sent as an attachment to an email message. OnBase data and documents are stored on NDOR servers.

Multiple vendors provide electronic/digital signature tools that can be incorporated into project collaboration sites and tools. DocuSign is a vendor that provides digital signature technology, and in Nebraska this software can be integrated with OnBase. NDOR is currently using DocuSign for approvals of certain types of agreements.

Q: Are workflows open to creation by any user?
A: No, workflows are all controlled and set up by system administrators.

3.7 Civil Integrated Management and Enterprise Wide Asset Management

The group discussed enterprise project management. At NDOR there is a team looking to implement a statewide CIM approach to the highway system. The focus is capturing the highway asset management data (planning, surveying, design, as-builts, and contractor observations) and tracking data for a current representation of what the asset looks like. Roadway designers are using 3D models, and the bridge section is working to implement this concept also. Traffic division has plans to develop a GIS application to store information on tall overhead signs including wind load data.

Greg Cullum with AHTD's GIS section presented on the future use of data collected by e-Construction technologies. AHTD is collecting data and is moving toward a data warehouse to enable access outside a particular group. The approach is focused on consistency and eliminating redundancy, and an enterprise data committee is building a data warehouse to bring all information together. Culvert data is one area of focus for tracking data for maintenance purposes. Ultimately NDOR would like to add culvert data to where inspectors can pull up information on the tablet device and find all attributes of the culvert.

The enterprise data committee at AHTD is identifying what data exist and how people are using it. The goal is to maximize efficiencies in data usage and improve documentation to ensure accuracy. NDOR's data governance group will determine how to aggregate the various sources of truth for data to a certain acceptable level.

Q: Will data warehousing be a replication of the database transactions?
A: This will occur on a case by case basis.

Q: Are there plans for additional data in Arkansas on culverts such as design information, dates, etc.?
A: Not currently, but if we do it might be attached back to the core data for the asset.

3.8   Discussion on FHWA Division Office Pilot Program for Tablets

FHWA and the consultant team provided information on the Division Office pilot project for tablet devices, which includes an assessment of the iPad and the Surface Pro. Currently, Florida, Michigan, and Iowa Division Offices are using iPads, and Texas, Missouri, North Carolina, Pennsylvania, Utah, Virginia, and West Virginia Division Offices are using the Surface Pro.

Due to the cost of the card reader, the lack of Personal Identity Verification (PIV) card for Apple devices limits FHWA's ability to use digital signatures, but being able to sign contract modifications has the potential to speed up payment to the contractor. The Surface Pro currently has a cost effective solution for PIV card use when logging into the device. AHTD noted that a similar issue as noted in the FHWA pilot in that the Surface Pro does not have built-in GPS feature and requires a USB device for location referencing.

Appendix A – e-Construction Peer Exchange Agenda

Nebraska/Arkansas
e-Construction Peer Exchange

11301 West Baseline Road
Little Rock, Arkansas 72209

Agenda

July 26, 2016		
Time	**Topic**	**Presenters / Facilitators**

8:00am – 8:30am	Welcoming Remarks and Introductions
	    Peer Exchange Background and Overview
	    Goals for the Event
		Bernie Kuta, FHWA
		Emanuel Banks, AHTD
		Kevin Thornton, AHTD
		Devin Townsend, NDOR

8:30am – 9:15am	Nebraska e-Construction Practices and Future Goals
	    Falcon to OnBase Transition
	    AASHTOWare and ProjectWise
		Devin Townsend, NDOR

9:15 am – 10:00 am	Arkansas e-Construction Overview
	    DocExpress/e-Builder
	    Electronic Original Source Philosophy
	    Activities Since 2015 Peer Exchange
		Kevin Thornton, AHTD
		Ben Browning, AHTD
		Jamey Wilhite, AHTD

10:00am – 10:15am	Break	

10:15am – 11:45am	Arkansas Construction Records Documentation System
	    Decision to Implement AASHTOWare Project
	    SARS, COGS, and CoMRaDS
	    SiteManager Custom Reports
	    Record Retention and Document Management
		Ben Browning, AHTD
		Jamey Wilhite, AHTD
		Jared Bymaster, AHTD

11:45am – 1:00pm	Lunch	

1:00pm – 2:30pm	Collaborative Project Sites – DocExpress
	    Evaluation of Potential Solutions
	    Purchasing Licenses/Decision to Use
	    Electronic Plans, Provisions, and As-Builts
	    Application of Digital Signatures
		Ben Browning, AHTD
		Jamey Wilhite, AHTD

2:30pm – 2:45pm	Break	
2:45pm – 3:45pm	Discussion on IT Security Solutions, Firewalls, and Outside Access Microsoft Terminal Services for Virtual Private Networks	Sidney Foggo, AHTD Raymond Leung, AHTD
3:45pm – 4:15pm	Discussion on Day 1 Takeaways for Implementation	Tom Zagorski – Michael Baker International Tim Luttrell – Leidos
4:15pm – 4:30pm	Preview of Day 2 Agenda Items	Tom Zagorski – Michael Baker International
4:30pm	Adjourn	
Dinner on your own		

July 26, 2016

Time	Topic	Presenters / Facilitators
8:00am – 8:15am	Recap of Day 1 Discussion Themes and Safety Briefing	Tom Zagorski – Michael Baker International

8:15am – 11:00am	e-Construction Mobile Devices
	    Devices, Applications, and Processes
	    Current Practices and Future Plans
	    Discussion with Contractors and DOT Field Personnel on e-Construction
		Ben Browning, AHTD
		Jim Barton, Arkansas AGC Chapter

11:00am – 11:30am	Discussion on FHWA Division Office Pilot Program for Tablets	FHWA/All
11:30am – 12:45pm	Lunch	
12:45pm – 1:30pm	e-Construction Software Demonstration	Ben Browning, AHTD Jamey Wilhite, AHTD Devin Townsend, NDOR

1:30pm – 2:00pm	Civil Integrated Management
	    Enterprise-Wide Asset Management
	    Data Governance
	    Data and Workflow Processes
		Ben Browning, AHTD
		Lorraine Legg/Devin Townsend, NDOR

2:00pm – 2:15pm	Discussion on Takeaways for Implementation and Next Steps	Tom Zagorski, Michael Baker International Tim Luttrell, Leidos
2:15pm – 2:30pm	Closing Remarks and Feedback on Peer Exchange	All
2:30pm	Adjourn	

Appendix B – e-Construction Peer Exchange Roster

Name	Agency
Emanuel Banks	AHTD
Jim Barton	AGC Arkansas Chapter
John Bledsoe	AHTD
Ben Browning	AHTD
Jared Bymaster	AHTD
Angel Correa	FHWA
Greg Cullum	AHTD
Brent Dather	FHWA Arkansas Division Office
Sidney Foggo	AHTD
Micky Jacobs	NDOR
Bernie Kuta	FHWA Resource Center
Lorraine Legg	NDOR
Jason Lehn	NDOR
Raymond Leung	AHTD
Tim Luttrell	Leidos
Stephen Sample	AHTD
Bryan Stewart	AHTD
Tony Sullivan	AHTD
Kevin Thornton	AHTD
Devin Townsend	NDOR
Cody Wilbers	FHWA Nebraska Division Office
Jamey Wilhite	AHTD
Tom Zagorski	Michael Baker International