FDOT’s Path to e-Construction

Amy Tootle, P.E. – FDOT

Efficiency through technology and collaboration
Leaping into the 21\textsuperscript{st} Century – Why Now?

1. Antiquated way of doing business
2. Keep up with our partners
3. Work $marter not harder
4. Transformational leadership
5. Generational change
6. Successful organizations continually improve
7. Design is already electronic
Antiquated Way of Doing Business

• Documents and forms are printed, signed, scanned and emailed or mailed
• Multiple copies are made for multiple recipients
• Turnaround for approvals and contract change execution is sometimes very slow
• Special runners are sometimes employed to hand deliver contractual documents
Keeping Up With Our Partners

• Consultants/contractors are utilizing advanced technology
  ✓ Mobile Devices
  ✓ Electronic As-Builts/Review of Plans (Blue Beam, Adobe, etc)
  ✓ 3D Models > Automated Machine Guidance (AMG)

• Improved collaboration and data sharing amongst stakeholders
Generational Change

Boomers
- Question Authority
- Idealistic
- Individuality
- Work Ethic

Generation X
- Comfortable with Technology
- Self Reliant
- Accept Diversity

Generation Y
- Tech Savvy
- Highly Educated
- Team Players
- Embrace Diversity
Work $marter, Not Harder

• Florida’s Work Program is one of the largest in the country
  ➢ Total Funding & Budget for 2014/2015 – 2018/2019 = $41.8B
    ✓ 47% for Construction
  ➢ 535 Active Construction Contracts
    ✓ $11.5B

• State Highway System = 43,424 Lane miles
  ➢ 287,977,300 Daily Vehicle Miles Traveled (DVMT)
Transformational Leadership

Step Up

• Bold, Innovative, and Inspirational

  ➢ Bold: Ideas to make the department better, faster, smarter
  ➢ Innovative: Ideas to fruition by defining specific objectives to accomplish
  ➢ Inspirational: Get others excited about ideas
Transformational Leadership

Step Up

• CPR

➤ Consistent: Decisions are made which are consistent with department policy

➤ Predictable: Decisions are predictable, given the circumstances

➤ Repeatable: Decisions are repeatable by others in similar situations
Continuous Improvement

• If it Ain’t Broke, Don’t Fix It (Not acceptable!)

• Actively listen to industry and staff in the “trenches”
  ➢ Their needs
  ➢ Technology being used
Design is Already Electronic

• Projects *Let* Electronically
  ➢ Since 2005

• 3D Design Models
  ➢ Few Design Projects
  ➢ Revising Specifications for Construction
  ➢ Implementation undetermined
e-Construction Implementation

• Vision

• Systems Thinking
  ➢ Overall picture
  ➢ Interconnected relationships
  ➢ There are no final answers
  ➢ Every solution creates new problems

• Educate the Districts & Stakeholders
e-Construction Implementation – The Parts

- Collaborative Sharing Site
  - Phased Implementation - March 2015

- Form Automation
  - Ongoing Implementation

- Mobile Devices
  - Phased Implementation - Fall 2015
e-Construction Implementation – The Parts

- Electronic As-Builts
  - March 2015

- Digital Signatures
  - Ongoing Implementation
Collaborative Sharing Site

- October 2013 – Management approval
- July 2014 – Procured consultant (Project Solve)
- September 2014 – Team devising standard workflows
- March 2015 – Phased Implementation
Collaborative Sharing Site

Collaboration Process
ProjectSolve SP Welcome to the project site!

This site has been created to facilitate collaboration among the project team and to provide agency stakeholders with an easy means to access and comment on project deliverables.

If you have any questions about the content found here, please contact [email protected]; additional supporting documentation can be found here.

Navigation

- Action Items
- Project Documents
- Incoming Submittals
- Project Inbox
- My Desktop
- Project Slideshow
- Plan Review Manager
- Project Tasks
- Project Calendar
- RFPs
- Project Contacts
- Shop Drawings

Project Photographs
Collaborative Sharing Site

- Expense
  - Budgeting into Work Program
  - $125 per month/contract
    - $800K/year
Form Automation

- Adding digital signature blocks
- Forms to be pre-populated with project specific data
- Transmittal forms revised to require electronic file #’s
Mobile Devices

- May 2014 – Begin E&O Windows based pilot
- November 2014 – End Windows based pilot
- April 2015 – Construction pilot
- Fall 2015 – Phased implementation for construction
Mobile Devices

• Construction Specific Pilot Project
  - Interface with project specific SharePoint site
  - Access to eBooks (specifications, standards, manuals)
  - Video/meeting capability
  - As-Built Plans
  - Email/calendar access
Mobile Devices

• Legislative Budget Request 2015/2016

  ➢ $630K First Year
    ✓ 300 devices/accessories/data plans
    ✓ Training
    ✓ Custom software

  ➢ $180K annually for data plans

  ➢ $150K / 3 years for device replacement
Electronic As-Built Plans

- Fall 2013 – Decision to go electronic with As-Built Plans
- Spring 2014 – Decision to use pdf software for As-Built Plans
- July 2014 – Evaluation of pdf software
- March 2015 – Implement electronic As-Built Plans
# Pavement

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Electronic As-Built Plans

- Expense
  - 393 Licenses statewide
  - $125 per license
    - $49,000
  - Reserve Money
Digital Signatures

- July 2, 2013 – Initial purchase of 390 digital certificate vouchers
- July 29, 2013 – Issued Memo of Understanding
- January 2015 – Approval by DFS to use digital signatures on monthly estimates
MEMORANDUM OF UNDERSTANDING

Between Florida Department of Transportation, Florida Transportation Builders Association, and Florida Institute of Consulting Engineers

DATE: July 25, 2013

SUBJECT: Use of E-Construction on FDOT Construction Contracts

Problem Statement:

Department of Transportation construction projects are often extremely complex in nature, highly technical, and require expertise in complex environmental and engineering conditions. These complex projects generate a large volume of high-level detailed, high accuracy engineering and technical documentation throughout the life of projects, resulting in numerous reports and multiple copies of documents. Besides the volumes of documentation, on-site contract, sub-contract reviews and approvals requiring many changes of design plans up to considerable time delay.

Objective:

The purpose of this paper is to highlight the need for streamlined communication of FDOT, FTBA, and FICE in the preservation of the environment and the availability of people and goods with a minimum throughput while implementing new ways of reducing costs and time delays.

Benefits:

The use of E-Construction on FDOT contracts will minimize or eliminate the use of paper thereby helping to preserve the environment. The process will also enable the simplified storage of data through E-Construction, eliminating handling of documents, printing, scanning, imaging, and retrieval of documents, and will further eliminate cost of long-term storage of paper documents. Further, it will speed up the review and processing of documents and reports.

Commitment:

This commitment of FDOT, FTBA, and FICE is to wholeheartedly and without delay enforce and promote this commitment practice among the designated state and local agencies, transportation boards, committees, and implementing agencies, and engineering constructability on the basis of Florida.

[Signatures]

www.dot.state.fl.us
Digital Signatures

• Laws
  • Florida Statue 668 – Electronic Commerce
  • Florida Statue 471.025 – Regulation of Professions and Occupations (Engineering)

• Rules
  • Florida Administrative Code 61G15-23.003 – Procedures for Signing and Sealing Electronically Transmitted Plans, Specifications, Reports or Other Documents.
I CERTIFY THAT THE GOODS AND SERVICES HAVE BEEN RECEIVED, THE PAYMENT IS NOW DUE, THE ACCOUNT CODES INDICATED ARE VALID AND BUDGET/FUNDS ARE AVAILABLE. THIS REQUEST FOR PAYMENT MEETS THE TERMS AND CONDITIONS OF THE PROCUREMENT AND PROGRESS OF WORK SPECIFIED HEREIN IS PURSUANT TO THIS CONTRACT AND IS APPROVED IN SUBSTANTIAL COMPLIANCE WITH ALL PLANS, SPECIFICATIONS, AND RULES OF THE DEPARTMENT INCLUDING THE PROVISIONS OF SECTION 337.11, F.S., WITHIN THE DATES SHOWN ABOVE.

ENGR.IN CHARGE

DIST.CNST. ENGR.

Amy C Tootle

FPE # 86414

2015.03.02 09:52:52-05'00'
THE ABOVE NAMED PROFESSIONAL ENGINEER SHALL BE RESPONSIBLE FOR THE FOLLOWING SHEET(S) IN ACCORDANCE WITH RULE 61G15-23.003, F.A.C. THIS PROJECT WAS CONSTRUCTED IN SUBSTANTIAL COMPLIANCE WITH THESE PLANS AS PROVIDED BY THE ENGINEER OF RECORD. IF CHANGES WERE MADE, THOSE CHANGES ARE INDICATED BY RED INK REVISION.
Digital Signatures

• Expense
  ➢ 390 Certificates
  ➢ $100 per certificate / 2 years
    ✔ $19,500/year
  ➢ Paid by OIS
Summary

- Initial Investment: $1.5M
- Annual Recurring Expense: $862K - $1M
- Reduction in Scanning Costs: $125K
- Savings each year: ~ $22M
Contact Information

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