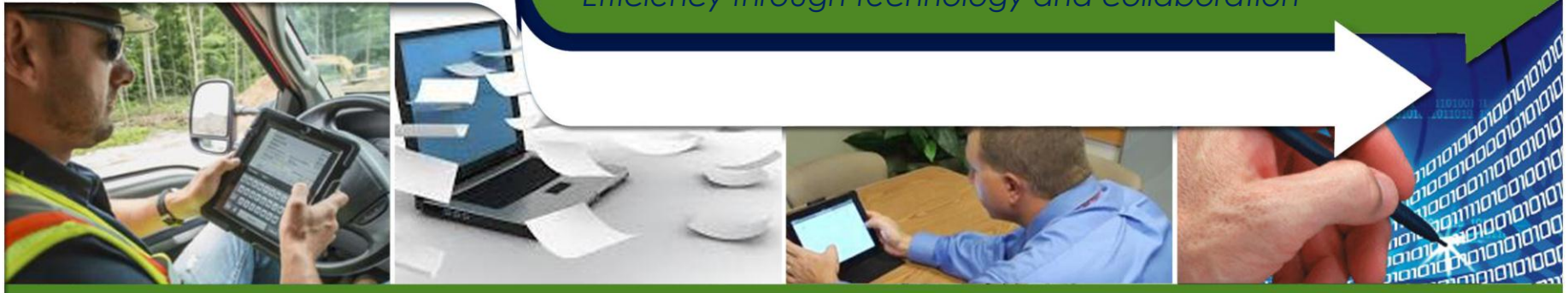


FDOT's Path to e-Construction

Amy Tootle, P.E. – FDOT

Efficiency through technology and collaboration



U.S. Department of Transportation
Federal Highway Administration

Leaping into the 21st 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

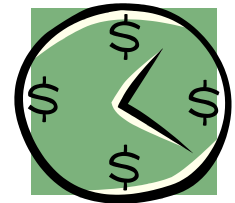


Generation Y

- 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

- **C**onsistent: Decisions are made which are consistent with department policy
- **P**redictable: Decisions are predictable, given the circumstances
- **R**epeatable: Decisions are repeatable by others in similar situations



Continuous Improvement

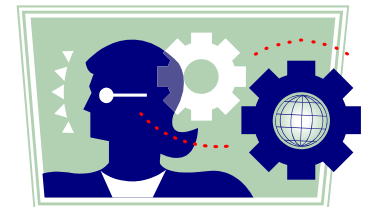
- If it Ain't Broke, Don't Fix It (Not acceptable!)
- Actively listen to industry and staff in the “trenches”
 - Their needs
 - Technology being used

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

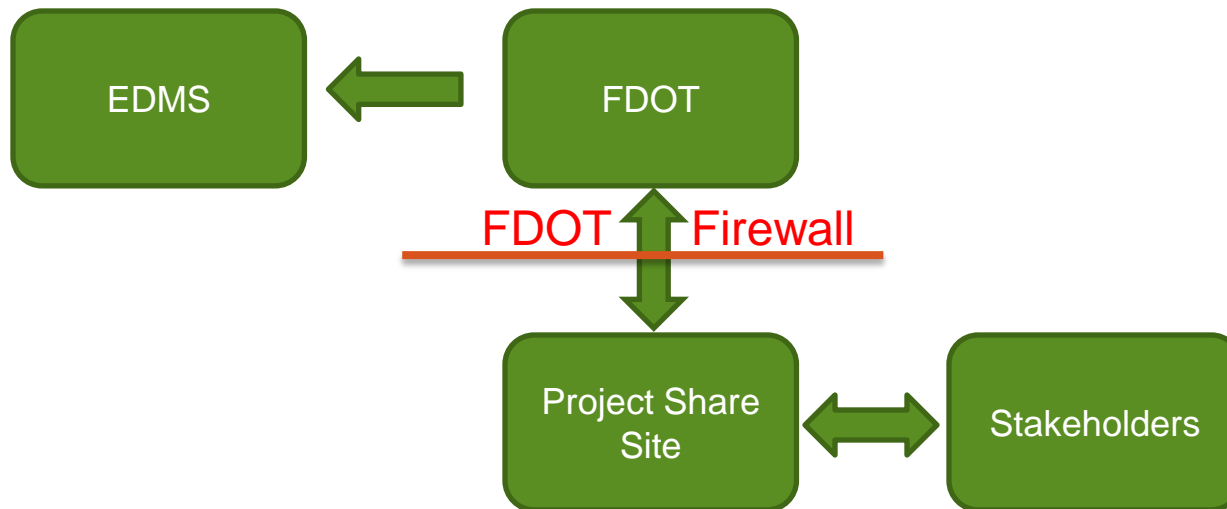
e-Construction Implementation – The Parts

- 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

e-CONSTRUCTION

The screenshot shows a web browser displaying a SharePoint site at <https://fdot.pbid.com/sites/district6/fdotpsm/SitePages/Home.aspx>. The page is titled "ProjectSolve^{SP} Welcome to the nnnnnn project site!". The left sidebar contains a "BROWSE" menu with links to Home, Action Items, CIM CPPR Link, Citrix Link, CIM Warranties Link, Final Documents, GIS Link, Incoming Submittals, Lane Closure, Materials Link, My Desktop, Plan Review Manager, Plans, Progress Reports, Project Calendar, Project Contacts, Project Documents, Project Inbox, Public Involvement Matrix, Project Photographs, Project Tasks, QAs Performed, Recent, Review Manager, RFIs, Schedule, Shop Drawings, Time File, and Unforeseen Work Matrix. The main content area includes a welcome message, a contact email (fdot@support.com), and a "Current Weather" widget for Hialeah, FL, showing 75°F and light rain. A "Navigation" section features icons for Action Items, Project Documents, Incoming Submittals, Project Inbox, My Desktop, Project Slideshow, Plan Review Manager, Project Tasks, Project Calendar, RFIs, Project Contacts, and Shop Drawings. A "Project Photographs" section displays an aerial view of a multi-lane highway with a caption: "Station 1 - NB-524/518 Interchange, FSN # 2405931-1-5201, 249581-1-5210, 12.40.49".



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



e-CONSTRUCTION



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

Revu File Edit View Document Form Markup Measure Window Help

New Open Save Print E-mail Studio Text Pen Lines Shapes Image Camera Hyperlink Attachment Stamp

Test page*

Typewriter Properties

General

Author: CN982AT
Subject: Typewritten Text

Modified: 3/1/2015 8:38:23 ...
☐ Lock [0 Replies](#)

Appearance

Color:
Fill Color:
Opacity: 100
Fill Opacity: 100
Line Width: 0.00
Style:

Shape: Rectangle
End: Auto

Font: Times-Roman
Font Size: 9 ☐ Auto
Line Space: 1.00
Margin: 0.00
Text Color:
Alignment:
Font Style: **B I U T**

Layout

X: 8.3066 Inches
Y: 6.9785 Inches
Width: 0.1806 Inches
Height: 0.1528 Inches
Rotation: 0°

Grid Snap Content Markup Reuse Sync

16.50 x 10.60 in (8.28, 2.82)

Subject	Page	Lock	Status	Checkmark	Author	Date	Color	Comments	Depth
Typewritten Text	Page 1	<input type="checkbox"/>		<input type="checkbox"/>	CN982AT	3/1/20...		20'	
Cloud	Page 1	<input type="checkbox"/>		<input type="checkbox"/>	CN982AT	3/1/20...			
Line	Page 1	<input type="checkbox"/>		<input type="checkbox"/>	CN982AT	3/1/20...			
Typewritten Text	Page 1	<input type="checkbox"/>		<input type="checkbox"/>	CN982AT	3/2/20...		95'	
Cloud	Page 1	<input type="checkbox"/>		<input type="checkbox"/>	CN982AT	3/2/20...			

Drag control points to resize, or drag text box to move. Double click to edit text



2179763 As-Built Test Pavement Sample Sheet

PAVEMENT							
LINE	UNIT	QUANTITY		TOTAL		DESIGN NOTES	CONSTRUCTION REMARKS
		P	F	P	F		
	SY			89563	89486.6		This quantity was found in error and changed
58	SY	1596.7	✓		89400		
61	SY	1410.6	✓				
62	SY	12526.4	12450				
63	SY	2845.1	✓				
61	SY	2318.5	✓				
62	SY	2236.7	✓				
64	SY	714.2	✓			RAMP C-D CONNECTOR	
63	SY	4323.0	✓				

10+48.96 - 11+35.00	COLLEGE ST	0168	SY	559.9
307+74.85 - 308+41.53	SR 30	0182	SY	84.8
46+28.03 - 52+16.97	SUN HARBOR CONNECTOR	0183	SY	2118.1
107+66.27 - 108+64.76	STEPHENS AVENUE	0184	SY	419.0
272+32.00 - 272+62.00	SR 30	0187	SY	486.3

Width: 1.5088 Inches
Height: 0.3562 Inches
Rotation: 0°

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



Florida Department of Transportation
605 Suwannee Street
Tallahassee, FL 32399-0450

ANANTH PRASAD, P.E.
SECRETARY

RICK SCOTT
GOVERNOR

MEMORANDUM OF UNDERSTANDING

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

DATE: July 29, 2013

SUBJECT: Use of E-Commerce on FDOT Construction Contracts

Problem Statement:

Department of Transportation construction projects are often extremely complex in nature, highly technical, and extremely sensitive to complex environmental and engineering conditions. These contracts require generation of high level details, both contractual and technical throughout the life of contracts resulting in numerous reports and multiple copies of documents. Besides the volume of documentation on each contract, multi-level reviews and approvals requiring many changes of hands adds up to considerable time delay.

Objective:

The purpose of this paper is to strengthen already strong commitment of FDOT, FTBA, and FICE to the preservation of the environment, and the mobility of people and goods with a minimum disruption while implementing new ways of reducing costs and time delays.

Benefits:


Use of E-commerce on FDOT contracts will minimize or eliminate the use of paper thereby helping to preserve the environment. E-commerce will also result in significant savings of man-hours by eliminating handling of documents, printing, mailing, scanning and delivering 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:

It is the commitment of FDOT, FTBA, and FICE to whole-heartedly and without delay adopt and promote the E-commerce practice among the Department and sister agencies, transportation builders, contractors and Producer industries, and engineering communities throughout the State of Florida.


(Ananth Prasad; Secretary, FDOT)


(Bob Burleson; President, FTBA)


(Mark Mechling; President, FICE)

www.dot.state.fl.us



Digital Signatures

- Laws
 - Florida Statute 668 – Electronic Commerce
 - Florida Statute 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.

09/08/11
 COSECT FIN. PROJ.# MANDST JOB NO. STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
 12011 195719-1-56-02 01 - TRNSPORT/SITEMANAGER PAY ESTIMATE
 PROG. NUMBER - 5602 PROGRESS EST.NO. 0021 C.C. NO. 113
 F.A.P. NO. N/A FT MYERS CONSTRUCTION
 CONTRACTOR: XXXXXXXXXXXX ACME CONSTRUCTION, INC.

PESPJ11-1 PAGE 10
 CONTR. TYPE: CC CONSTRUCTION
 CONTRACT NO. T1329 ENGLISH
 LETTING DATE 06/17/09
 NO. OF JOBS ON ESTIMATE 02 / 02

JOB SUMMARY:

ORIG. JOB AMOUNT\$	1,800.00	0%	NEG	
APPROVED S.A.'S \$	0.00		ZERO *	!!
PRES. JOB AMOUNT\$	1,800.00	0%	CD	!! THIS ESTIMATE WILL BE !!
REG.WORK TO-DATE\$	0.00			!! PAID BY THE EED SYSTEM !!
		0%		!!

1. WORK
REGULAR WORK
- TOTAL WORK
2. ADJUSTMENTS
TOTAL ADJUSTM
3. AMOUNT PAYABL

!!!!!!!!!!!!!!
 !! TO BE PAID B
 !!!!!!!!!!!!!!!

CNTL	FCT	TR	A
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CONTRACT

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
 FL PE # 66414
 2015.03.02 09:52:52-05'00'

REG.WORK TO-DATE	\$ 11,819,279.80	ORIG. DAYS	900


BAL. OF PRES AMT	\$ 18,078,915.85		

BEEN
 NT CODES
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 OF WORK
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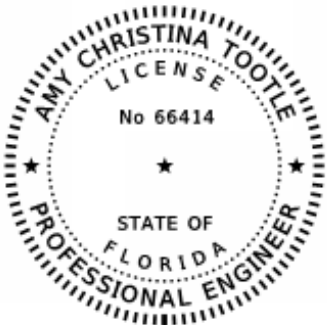
Amy C Tootle
FL PE # 66414
2015.02.27
13:28:52-05'00'


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.

Project Close out package - 

ROADWAY IS ADD

SHEET NO.	SHEET DESCRIPTION
1	KEY SHEET
2	FINAL "AS-BUILT" SIGNATURE SHEET
33	
35	
37	
39	
41	
43	





Amy C Tootle
FL PE # 66414
2015.02.27
13:28:52-05'00'

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.

<p>STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION 565 Suwannee Street Tallahassee, FL 32301</p>	<p>STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION</p>	<p>FINAL "AS-BUILT" SIGNATURE SHEET</p>	<p>SHEET NO. 3</p>
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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

Amy C. Tootle, P.E. – FDOT

State Construction Final Estimates Engineer

Amy.Tootle@dot.state.fl.us