

FDOT's e-Construction 2016

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Florida Department of Transportation



Agenda

1. Getting to Know FDOT
2. e-Construction at FDOT
3. Cost and Funding
4. Challenges
5. Preparation for Implementation

Getting to Know FDOT

- **Decentralized Agency**
 - 7 Districts
 - Turnpike Enterprise
- **6,454 FTE's**
 - 465 Construction
- **Construction Engineering Inspection**
 - 100% Consultant

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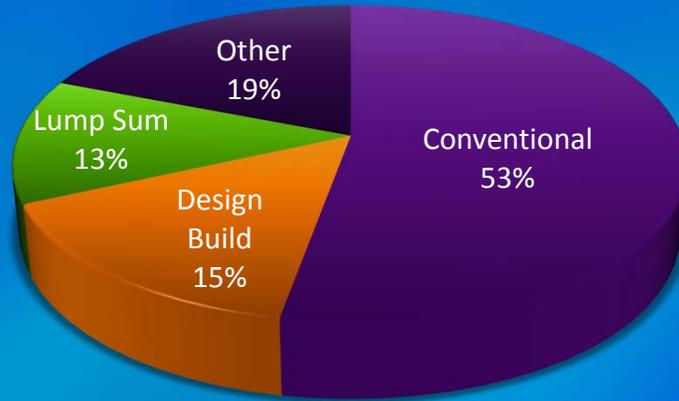
Getting to Know FDOT

- **Florida's Work Program is one of the largest in the country**
 - Total Funding & Budget for 2016/2017 – 2020/2021 = \$42.3B
 - ✓ 45% for Construction
 - 494 Active Construction Contracts
 - ✓ \$10.6B
- **State Highway System = 43,592 Lane miles**
 - 296,263,100 Daily Vehicle Miles Traveled (DVMT)



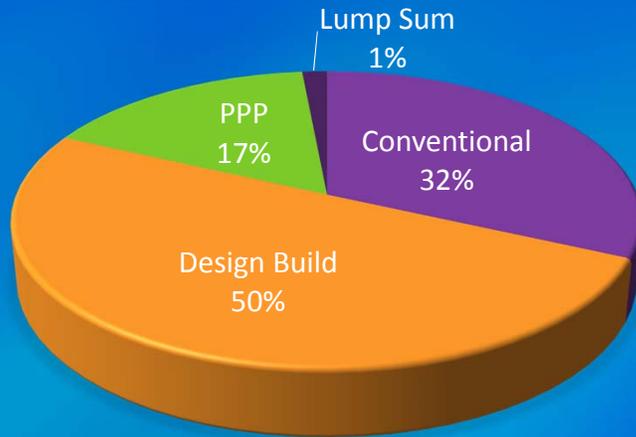
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Contract Types By Quantity – 02/2016

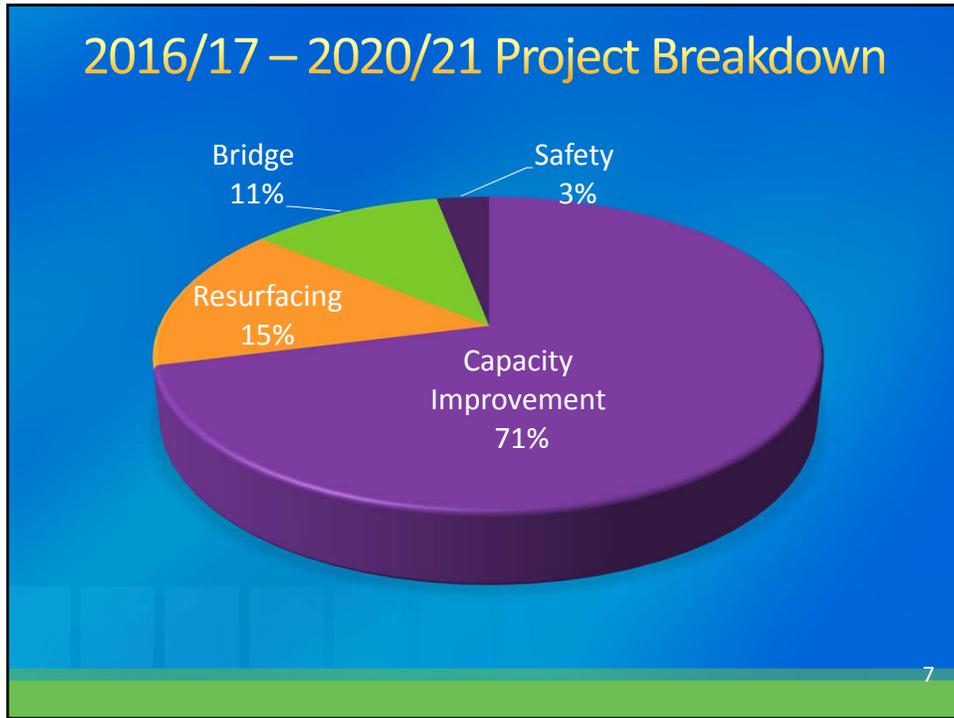


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Contract Type By Money – 02/2016



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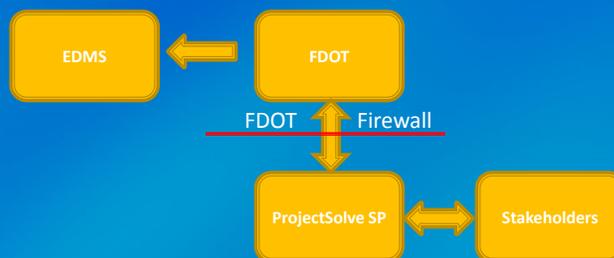
- ### e-Construction at FDOT
- Document Management
 - ProjectSolve SP
 - EDMS
 - Digital Signatures
 - IdenTrust
 - Electronic "As-Builts"
 - Bluebeam Revu eXtreme
 - Mobile Devices
 - iPad Air 2
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Document Management

- October 2013 – Management approval
- July 2014 – Procured consultant (Project Solve)
- August 2014 – First Project Activated (I-4 Ultimate)
- September 2014 – Team devising standard workflows
- July 2015 – Phased Implementation

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Document Management



Collaboration Process

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ProjectSolve SP

The screenshot displays the ProjectSolve SP interface within a SharePoint environment. The main content area features a 'Libraries and Lists' section with eight interactive icons: Project Documents, Project Photographs, RFI-RFC-RFM-NCR Log, Project Calendar, Construction Issue Log, FDOT Forms Library, Punchlist, and Project Plans. To the left, a sidebar provides navigation for project contacts, links, and tasks. The top navigation bar includes 'Administration' and 'District Name' options. A search bar is located in the upper right corner.

ProjectSolve SP

The screenshot shows a 'WORK PLAN CONTROLLING ITEM OF WORK' form. At the top, it identifies the 'FINANCIAL PROJECT ID' as V1381120 and the 'CONTRACT NO.' as 1142. Below this, there is a table with two columns: 'Description' and 'Location/Limits'. The form also includes a section for 'Prime Contractor or Subcontractors will work' with radio button options for 5 day work week, 7 day work week, 8 day work week, and Other. There are two large text areas for 'Contractor's comments' and 'Project Engineer's comments', each followed by a digital signature block with a red dot and a line for the signature and date.

- Standard Forms Automated in Library
- Include FIN and Contract No.
- Digital Signature Blocks

ProjectSolve SP

The screenshot shows the 'Project Plans' page in ProjectSolve SP. The page header includes 'FDOT', 'T1602', 'Administration', 'District Home', 'ProjectSolveSP Help', and 'Reporting Issues and Bugs'. The main content area is titled 'Project Plans' and features a search bar and a list of documents under the 'All Documents' tab. The list includes:

Name	Modified	Modified By
CADD ZIP FILES	May 14, 2015	Scott Sikorski
Final As Built Plans	May 14, 2015	Scott Sikorski
Original Plans	May 14, 2015	Scott Sikorski

- CADD Files
- Final “As-Built” Plans
- Original Plans (Released for Construction)

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ProjectSolve SP

The screenshot shows the 'Project Documents' page in ProjectSolve SP. The page header includes 'T1602', 'Administration', 'District Home', 'ProjectSolveSP Help', 'Reporting Issues and Bugs', and a search bar. The main content area is titled 'Project Documents' and features a search bar and a list of documents under the 'All Documents' tab. The list includes:

Modified	ID	Name	File Size	Metadata Doc Description	Metadata EDMS Doc Group	Metadata EDMS Doc Type	Structure Number	Approval Status
3 days ago	2151	9.88.3 SWPPP 056 12-30-15 SR31 Weekly-signed	190 KB	Stormwater Pollution Prevention Plan Construction Inspection Report,650-040-03	JOB CORRESPONDENCE	ENVIRONMENTAL CORRESPONDENCE	Not Associated with a Structure	Approved
3 days ago	2148	9.101.3 Ajax - SR 31 Char - 2 Week Look Ahead 12-30-15	22 KB	2 Week Look Ahead Schedule	JOB CORRESPONDENCE	WORK PROGRESS SCHEDULE	Not Associated with a Structure	Approved
3 days ago	1082	9.101.2 Revised Work Progress Schedule CPM 1 06-19-2015	2772 KB	Revised Work Progress Schedule - CPM	JOB CORRESPONDENCE	WORK PROGRESS SCHEDULE	Not Associated with a Structure	Approved
3 days ago	1081	9.193.1 Pipe video analysis 06-22-2015	599 KB	Drainage Correspondence	JOB CORRESPONDENCE	DRAINAGE	Not Associated with a Structure	Approved

- All Project Documentation in Folder
- Once Approved > EDMS

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EDMS



e-Document Search [Help](#)

[Contract Search](#) |
 [Position/Description Search](#) |
 [Financial Search](#) |
 [New/IGIS Enterprise View](#) |
 [Multimedia Search \(DDI tab\)](#) |
 [Project Search](#) |
 [Vendor Search](#)

Primary Search Options
 Search for documents by contract number, document number, financial project, firm & firm segment, roadway ID, vendor number, vendor FEIN, vendor name. Advanced Search is also available. Please note that the Advanced Search cannot be combined with Primary Search.
 An example Contract Number: T1001

By:

Show Advanced Search Options

Document Properties Drill-down Options

Location:

Business Area:

Document Group:

Document Type:

- COMPLIANCE : 2
- CONTRACT CHANGES : 2
- CONTRACT DOCUMENTS : 17
- DAILY DIARY : 34
- ESTIMATES : 12
- FINAL ESTIMATES : 3
- JOB CORRESPONDENCE : 58
- MATERIAL SAMPLING & REPORTING : 21
- PRE-LETTING : 1
- QUALITY ASSURANCE/QUALITY CONTROL : 4
- SUBLET WORK : 4
- TIME CORRESPONDENCE : 2
- UTILITY : 6




DEPARTMENT OF TRANSPORTATION
 Headed by the Office of Information Systems
 questions, comments or errors to:
[it@fdot.com](#) or [it@fdot.com](#)

- Long Term Document Storage
- Keep for Life of Retention Period

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Digital Signatures

- July 2, 2013 – Initial purchase of 390 digital certificate vouchers
- July 29, 2013 - Issued Memo of Understanding
- January 2015 – Approval by DFS for use of digital signatures on monthly estimates
- Winter 2015 – Contract Signature

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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.

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Florida Statute 668 – Part I Electronic Signatures

Florida Statute 668.003 (3) :

“**Digital signature**” means a type of electronic signature that transforms a message using an asymmetric cryptosystem such that a person having the initial message and the signer’s public key can accurately determine:

- (a) Whether the transformation was created using the private key that corresponds to the signer’s public key.
- (b) Whether the initial message has been altered since the transformation was made.

A “**key pair**” is a private key and its corresponding public key in an asymmetric cryptosystem, under which the public key verifies a digital signature the private key creates.

An “**asymmetric cryptosystem**” is an algorithm or series of algorithms which provide a secure key pair.

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Florida Statute 668 – Part II UETA

Florida Statute 668.50 - Uniform Electronic Transaction Act (UETA):

- Establishes the legal equivalence of electronic records and signatures with paper writings and manually-signed signatures.
- All States enacted except: Washington, Illinois and New York

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Florida Statute 471.025 – Engineering Seals

Florida Statute 471.025(1):

The board shall prescribe, by rule, one or more forms of seal to be used by licensees. Each licensee shall obtain at least one seal in the form approved by rule of the board and may, *in addition, register his or her seal electronically in accordance with ss. 668.001-668.006.*

....Drawings, specifications, plans, reports, final documents, or documents prepared or issued by a licensee may be transmitted electronically and may *be signed by the licensee, dated, and sealed electronically with said seal in accordance with ss. 668.001-668.006.*

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Florida Administrative Code 61G15-23.004

- (2) A professional engineer utilizing a digital signature to electronically sign and seal engineering plans, specifications, reports or other documents shall have their identity authenticated by a certification authority and shall assure that the digital signature is:
- (a) Unique to the person using it;
 - (b) Capable of verification;
 - (c) Under the sole control of the person using it; and,
 - (d) Linked to a document in such a manner that the digital signature and correspondingly the document is invalidated if any data in the document is changed.

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Digital Signatures

IdenTrust

- NIST Level 3
- PKI Infrastructure

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Digital Signatures

DigiCert, Inc.
 2600 West Executive Parkway, Suite 500
 Lehi, Utah 84043
www.digicert.com

GlobalSign
 Two International Drive, Suite 105
 Portsmouth, New Hampshire 03801
www.globalsign.com

IdenTrust
 55 Hawthorne Street, Suite 400
 San Francisco, CA 94105
www.identrust.com/fdot

Cybertrust/Verizon
 140 West Street
 New York, New York 10007
<http://www.verizonenterprise.com>

Digital Signatures

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
FINAL INSPECTION AND ACCEPTANCE OF FEDERAL-AID PROJECT FDOT-1532
CONTRACT YEAR
YEAR

INSTRUCTIONS: District to complete this form for each completed exempt project

<small>FEDERAL PROJECT NO.</small> 3451015P	<small>FINANCIAL PROJECT ID</small> 43195915201	<small>CONTRACT NO.</small> T1602
<small>DESCRIPTION OF IMPROVEMENT AS PROGRAMMED:</small>		

EXAMPLE

NOTICE OF FINAL INSPECTION: *The above listed project has been completed in reasonable close conformance with the approved plan.*

SIGNATURE  Amy C Tootle Digitally signed by Amy C Tootle
 Contact Info: FL PE # 66414
 Date: 2016-01-06 16:26:01-0500
 (RESIDENT ENGINEER)

TITLE State Construction Engineer INSPECTION DATE 01/06/16

TITLE State Construction Engineer INSPECTION DATE 01/06/16

NOTICE OF FINAL ACCEPTANCE: *The above listed project has been completed in reasonable close conformance with the approved plans and specifications including authorized changes and extra work.*

SIGNATURE _____ (DISTRICT CONSTRUCTION ENGINEER)

TITLE District Construction Engineer FINAL ACCEPTANCE DATE _____

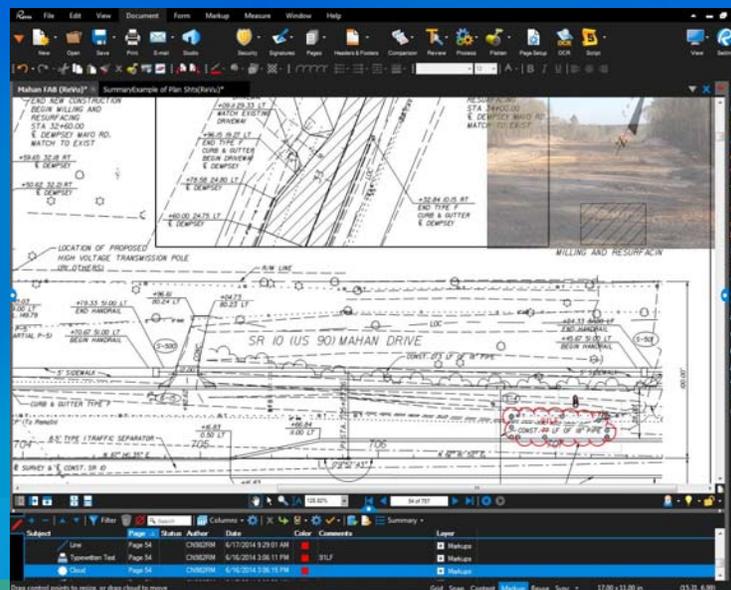
Distribution: Federal Aid Office (MS 21)
 Comptroller, Attention Federal Aid Project Account Section (MS 42)
 IT/MS, Program Operations Engineer (MS22)

Electronic Final “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
- July 2015 – Implement electronic “As-Built” Plans

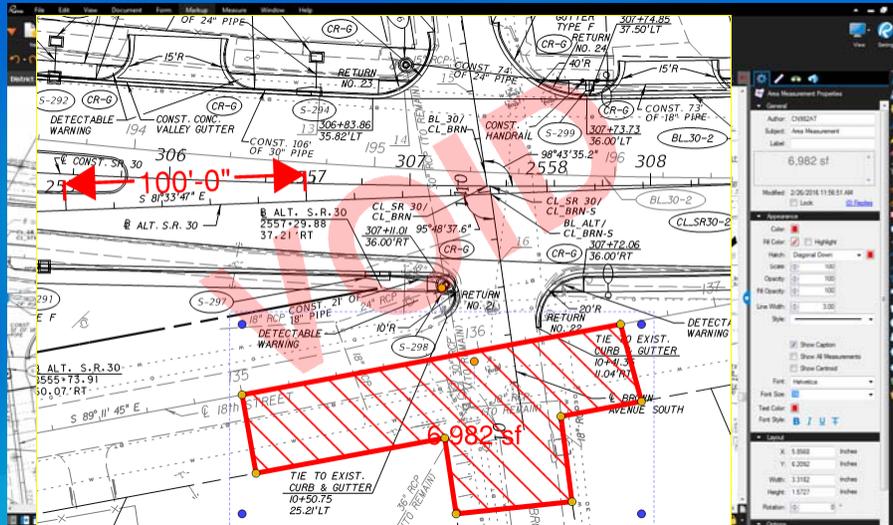
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Electronic Final “As-Built” Plans



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Electronic Final "As-Built" Plans



Mobile Devices

- May 2014 – Begin E&O Windows based pilot
- November 2014 – End Windows based pilot
- August 2015 – Construction iPad pilot
- Summer 2016 – Phased implementation for construction

Mobile Devices



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Mobile Devices



iPad versus Surface Pro

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Mobile Devices

Ipad Air 2

- Wifi + Cellular
- 64 GB
- Otterbox Defender Case
- Unlimited Data

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Mobile Devices

- Web Interface with ProjectSolve SP
- Access to Enterprise Applications (VPN)
 - Junos Pulse
- Video/meeting capability
 - Skype
 - GoToMeeting
- As-Built Plans/PDF Documents
 - BlueBeam
- Email/calendar access
 - OWA
 - Outlook
- SiteManger
 - Citrix
- MS Office
 - One Drive/One Note/Word/Excel



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Cost Breakdown

- Digital Signatures: \$39k/2 years
 - 390 Users
 - Paid by OIT
- ProjectSolveSP: \$800k/year
 - \$125 per month/contract
 - Budgeted into Work Program
- Bluebeam: \$49K
 - 393 Construction Users
 - Reserve Money
- iPads: \$210k
 - 287 Users
 - LBR or Grant?



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Cost Summary

- Initial Investment: **\$1.1M**
- Annual Recurring Expense: **\$682K - \$931k**
- Reduction in Scanning Costs: **\$125K/year**
- Savings each year: **~ \$22M**



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Challenges

- District Buy In
- The “rest” of the Agency catching up
- Mobile Device Funding
- Device Neutral

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Preparation for Implementation

- Specifications
- e-Construction Website
- Training
- Industry Presentations
- Implementation Date

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Specifications Section 4 – Scope of Work

4-1 Intent of Contract

The intent of the Contract is to provide for the construction and completion in every detail of the work described in the Contract. Furnish all labor, materials, equipment, tools, transportation, and supplies required to complete the work in accordance with the Contract Documents.

Upon execution of the Contract, the Contractor and Department agree that all informational, contractual and other business required for this project will be through a system of paperless electronic means. When the Specifications require a written submission of documentation, such documents must be submitted and exchanged electronically using the Department provided web-based collaboration site. All documents requiring a signature must be executed electronically by both parties in accordance with Chapter 668, Florida Statutes, and have the same force and effect as a written signature.

All persons requiring access to the collaboration site shall be identified during the preconstruction conference. Persons may be added or removed during the life of the Contract on an as needed basis. All persons that normally sign paper documents, and will be using the site, must acquire digital signature certificates.

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Specifications

Some language removed from the July 2016 Specification Book :

- Copy
- Copies
- Deliver
- Four
- Notify
- Photographic
- Print
- Provide
- Three
- Two
- Xerographic

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E-Construction Website



The screenshot shows the 'Construction' website with the following structure:

- Construction**
 - Office of Construction
 - Programs & Services
- ALTERNATIVE CONTRACTING**
 - Alternative Contracting
 - CTQP
 - CM@Risk
 - Design-Build
 - Design-Build Ads
 - Lump Sum
 - Public Private Partnerships
- CONTRACTOR ISSUES**
 - Contractor Issues (ALL)
 - Bid Questions
 - CPRR Guidelines
 - Conflict of Interest FAQs
 - Dispute Review Board
 - Monthly Estimates
 - Pipe Repair Matrix
 - PreQual, Specialty Engineers
 - QA/QC Plan Details
 - Surety Information
 - Wage Rates
- e-CONSTRUCTION** (highlighted in a yellow box)
 - As-Built Plans
 - Digital Signatures
 - FHWA e-Construction
 - Mobile Devices
 - Project Solve
- e-CONSTRUCTION** (repeated at the bottom)
 - As-Built Plans
 - Digital Signatures
 - FHWA e-Construction
 - Mobile Devices
 - Project Solve

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Preparation for Implementation

- Training
 - Webinars
 - Internal
 - External
 - Pre-Construction
- Industry Presentations
 - Contractor Meetings
 - Conferences
- Implementation Date – July 2016

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Contact Information

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