ITSFM AS-BUILT DELIVERABLES

Agenda

• History of the ITSFM
• What ITSFM is and is not
• System Benefits
• As-built Data Collection
• As-built Acceptance Testing
FDOT needed a tool to manage ITS infrastructure:

- **Asset management:**
  - ITS devices and support equipment
- **Configuration management:**
  - Fiber optic and electric connectivity
- **Document management:**
  - As-built plans, cut sheets, service manuals
- Accessible from the office, maintenance shop or the field
- Capable of “Real-time” updates and reporting
HISTORY OF THE ITSFM

• The solution:
  ▪ ITS Facilities Management (ITSFM) system
    ➢ Allows multiple users to simultaneous access the database
    ➢ Browser based application available over the Internet
    ➢ Global Information System (GIS) with positional accuracy
  ▪ Statewide naming standards
    ➢ Standard enable human resource sharing across District boundaries
  ▪ Comprehensive training program
    ➢ Instructor-lead
    ➢ Computer-based
HISTORY OF THE ITSFM

• 2006 – Deployed Version 1 (Prototype)
• 2010 – Deployed Version 2
  ▪ Included early recommendations from district users
• 2013 – Deployed Version 3
  ▪ Won ITS America’s Best of ITS Awards in the Best Innovative Product category
• 2016 – Deployed Version 4
  ▪ Added Web Interface Service (WFS) for computer-to-computer data sharing
January 2017

- As-built deliverables were expanded to include:
  - GPS coordinates for infrastructure
  - Fiber optic splicing diagrams
  - Equipment inventory
  - Feature Import Templates
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ITSFM – WHAT IT IS…

The ITSFM is an asset, configuration & document management system that supports:

- Fiber Optic Communications
- Wireless Communications
- Toll Facilities
- Ramp Meter & Signals
- Equipment Facilities
- ITS Field Devices
- Electrical Service
ITSFm – What It Is Not...

- Not a network monitoring system
- Not a maintenance ticket system
- Not a spare parts/inventory system
- Doesn’t replace need to locate cables in the field for excavators
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SYSTEM BENEFITS

• Real-time information
  ▪ Information is immediately available via web browser — no reporting delays or waiting for daily or weekly uploads.…
  ▪ No confusion when running reports — “Is this old data or does it include the work we did last week?”
SYSTEM BENEFITS

• Remote access to as-built documents/ photos, cut sheets, etc.
SYSTEM BENEFITS

- Can post notes in real-time (directions, special conditions, photos, combination lock codes)
SYSTEM BENEFITS

• Latitude and longitude for all facility sites

You can find a feature...

*With high level of accuracy!* +/- 3 feet
SYSTEM BENEFITS

• ITSFM Web Feature Service (WFS)

• The goal is to share data with other software applications and mitigate conflicts and eliminate duplicate data entry and maintenance.
SYSTEM BENEFITS

• The ITSFM stores geo-data that can be incorporated into new roadway designs to provide the means to quickly identify potential conflicts.

• Conflicts can be avoided, or

• ITS relocation cost can be included in the construction project and away from maintenance funds.
SYSTEM BENEFITS

Mitigate Conflicts – Create “As-built Condition” CADD File

• ITSFM-to-MicroStation
  ▪ Roadway designers can use “Spatial Export” to create a MicroStation CADD file that includes all document ITS facilities.
  ▪ Export is a snapshot of the “As-built Condition” during the design phase.
SYSTEM BENEFITS

• ITSFM-to-MicroStation
  ▪ The final product is a CADD rendering of the ITS geofeatures:
    ➢ Equipment Sites
    ➢ Support Structures
    ➢ Conduit Ductbanks
    ➢ Conduit Access Points
    ➢ ITS & Signal Devices
  ▪ Identifying conflicts during design allows problems to the address before construction starts.
SYSTEM BENEFITS

- ITSFM-to-Esri GIS
  - The goal of the ITSFM-to-GIS interface is to share ITS positional information to users outside the proprietary ITSFM system.
  - ITS geofeatures includes:
    - Equipment Sites,
    - Support Structures,
    - Conduit Ductbanks,
    - Conduit Access Points, and
    - ITS & Signal Devices.
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AS-BUILT DATA COLLECTION

• ITSFM data collection tools and training are available:
  ▪ Data collection forms
  ▪ GPS & cable mapping
  ▪ Feature Import Templates
DATA COLLECTION FORMS

• Custom forms designed to document new installations:
  ▪ ITS infrastructure
  ▪ Equipment sites
  ▪ Electric service points
  ▪ Equipment racks
  ▪ ITS equipment assets
DATA COLLECTION FORMS

• Fiber cable and access point schematics
  ▪ Cable sequential readings
  ▪ Point-of-attachments
DATA COLLECTION FORMS

• Forms can be downloaded from ITSFM website
GPS & CABLE MAPPING

• GPS Infrastructure mapping:
  ▪ Conduit
  ▪ Conduit access points
  ▪ Support structures
  ▪ Electric & communication cables

• Deliverables must meet:
  ▪ Minimum data requirements
  ▪ Follow naming standards
  ▪ Include cable configuration details

• Training is available
GPS & CABLE MAPPING

• GPS seed files are available:
  ▪ ITSFM data dictionary
  ▪ 1/10th mile marker locations

• Custom GPS export routines are available:
  ▪ Point Features (Cabinet, Pole, Pullbox, etc.)
    ➢ CSV File with Feature Coordinates and Attributes
    ➢ Export Options:
      o Description Values
      o ITSFM, Esri & MicroStation Code Values
      o Linear Features (Conduit)
GPS & CABLE MAPPING

• Fiber cable mapping:
  ▪ Capture cable readings at each:
    ➢ Manufacture/Type/Size/Year
    ➢ Conduit access point entrance or exit
    ➢ Both sides of a splice enclosure
    ➢ Patch panel terminations
  ▪ Populate readings on field drawn schematic and collection forms

• Training is available
FEATURE IMPORT TEMPLATES

• Training is available
  ▪ How-to Video
  ▪ Instructor training:
    ➢ Lessons learned
    ➢ Quality review of the data
    ➢ Understanding the ITSFM code list
    ➢ Demonstrations
    ➢ Hands-on exercises
  ▪ Quality review and testing:
    ➢ Completeness
    ➢ Accuracy
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CEI RESPONSIBILITIES

• The CEI maintains records to:
  ▪ Verify installations used approved materials and equipment
  ▪ Track progressive placement of system components over the life of the project
  ▪ Document nonconforming conditions
  ▪ Determine accuracy and completeness of the contractors as-built documents

• CEI test as-built deliverables before recommending acceptance
CEI RESPONSIBILITIES

• Acceptance testing as-built deliverable:
  ▪ Common forms that supplement the feature import templates or GPS mapping files:
    ➢ ITSFM032 - Electrical Site
    ➢ ITSFM033 - Utility Demarcation Site
    ➢ ITSFM037 - Fiber Optic Patch Panel Connection
    ➢ ITSFM055 - Equipment Rack
    ➢ ITSFM056 - Fiber Optic Cable & Conduit Schematic
    ➢ ITSFM057 - Equipment Site Schematic
  ▪ Training is available
CEI RESPONSIBILITIES

• Acceptance testing as-built deliverable:
  ▪ GPS mapping files:
    ➢ Raw GPS data files and differential correction summary
    ➢ Electronic folders containing the Site ID Name and picture files
    ➢ CSV files ready for import into the ITSFM database:
      o Feature description
      o ITSFM code values in-place of the descriptions
  ▪ Audit record templates and training are available
CEI RESPONSIBILITIES

• Acceptance testing as-built deliverable:
  ▪ Feature Import Templates
    ➢ CSV files ready for import into the ITSFM database:
      o Feature description
      o ITSFM code values
  ▪ Passing test scores:
    ➢ Coordinates = 100%
    ➢ Attributes = 95%
  ▪ Audit record templates and training are available
ITSFM CONTACTS

Randy Pierce - ITS Communications Administrator
Randy.Pierce@dot.state.fl.us
Florida Department of Transportation

Tim Sapp - ITSFM Product Manager
Tim.Sapp@atkinsglobal.com
Atkins

ITSFM Website
http://www.fdot.gov/traffic/itsfm.shtm