State of Florida

Department of Transportation

DISTRICT FOUR

APPENDIX 6
ITSFM FUNCTIONAL REQUIREMENTS FOR THE DISTRICT FOUR DISTRICT-WIDE IMPLEMENTATION

Transportation Systems Management and Operations (TSM&O) Device Maintenance Contract, District Four

Financial Project Number(s): 406795-7-72-01 and various

Proposal/Contract Number: E4X61

ITS Facility Management (ITSFM)

ITSFM Functional Requirements for the District Four District-wide Implementation

Version 1.0
Issue Date: September 17, 2021

Prepared by:

Florida Department of Transportation
District Four
3400 W Commercial Blvd.
Ft. Lauderdale, FL 33309

(954) 777-4130

Document Control Panel	
Created By:	Tim Sapp
Date Created:	March 26, 2021
Version No.:	1.0
Reviewed By / Date:	Anthony Mendoza / April 30, 2021
Reviewed By / Date:	Nicolas Garcia / May 3, 2021
Reviewed By / Date:	Nicole Forest / August 10, 2021
Reviewed By / Date:	Russell Allen / September 17, 2021
Approved By / Date:	Alexandra Lopez / September xx, 2021
Date Issued:	September xx, 2021
Version No.:	
Modified By / Date:	
Reviewed By / Date:	
Date Issued:	
Version No.:	
Modified By / Date:	
Reviewed By / Date:	
Date Issued:	

Table of Contents

1. Purpose

District Four will use the ITS Facility Management (ITSFM) to model Intelligent Transportation System (ITS) equipment assets and support infrastructure to document installed conditions, manage asset types, and the electrical and communication subsystem configuration and utilization across of the entire ITS system. The ITSFM system's performance requires data populated within the system to be correct, trustworthy, and adequate to meet the District's reporting needs.

This document provides a brief item description and guidance on how the ITSFM will be implemented with District Four and the requirements for ITS feature and assets types, feature attribution and data quality.

2. Introduction

The Florida Department of Transportation (FDOT), State Traffic Engineering and Operations Office (STEOO) designed the ITSFM system to satisfy the long-term ITS asset and configuration management needs of the FDOT statewide, multi-agency transportation system including ITS, traffic signal systems and toll equipment. The ITSFM supports an extensive list of outside plant facilities and equipment used in modern ITS including the related fiber optic and wireless communication networks.

This system compiles ITS asset information in a single, web-accessible repository, allowing Districts and the Central Office to collectively manage the entire system in a coordinated manner. FDOT is implementing the ITSFM statewide to take advantage of this tool to gain efficiencies resulting in significant savings and increased system availability and reliability. This document guides implementing the ITSFM system across District Four in a manner that is Consistent, Predictable, and Repeatable (CPR).

District Four encourages its maintenance contractors, regional partners, and maintaining agencies to use the ITSFM to manage FDOT assets.

3. Statewide Database

The ITSFM supports many organizations at multiple levels, from FDOT Central Office managers to District field technicians, from design consultants to installation contractors, in every transportation agency statewide. The ITSFM presents a regional and statewide view by including information from multiple jurisdictions and facilities owners. The ITSFM system supports a range of tasks, including planning and designing for system growth and upgrades, inter-agency coordination, resource sharing, emergency operations planning, training, long-term analyses, and research on ITS costs and benefits.

The ITSFM system compiles asset information in a single database, allowing the Central Office, Districts, and regional partners to collectively manage the entire system in a coordinated manner thereby requiring all transportation agencies to share a single database instance. The ITSFM is hosted by the Central Office and provided to the Districts and other agencies as a service. Separate or disconnected ITSFM systems are not authorized.

4. Serving Areas

The ITSFM uses Serving Areas to subdivide regional ITS, signal, and toll assets into separate regions. This allows the District and other agencies to manage their area of responsibility and user accounts. The District can authorize ITSFM users' distinct roles allowing them to view, create, edit and delete features within each Serving Area. The following serving areas are needed in ITSFM:

District Four Serving Areas	
Serving Area Name	**Maintaining Agency**
Broward RTMC	FDOT
City of Boca Raton	City
City of Ft. Lauderdale	City
City of Fort Pierce	City
City of Jupiter	City
City of Stuart	City
City of West Palm Beach	City
Broward County	County
Indian River County	County
Martin County	County
Palm Beach County	County
St. Lucie County	County
Miami RTMC	FDOT District Six
Florida Turnpike Enterprise	Florida Turnpike Enterprise

5. Maintaining Agencies and Regional Partners

Maintaining agencies may use the ITSFM to manage both FDOT and agency-owned transportation assets. FDOT's enterprise license allows the District to authorize user accounts to agency staff supporting the transportation management system.

If a maintaining agency or regional partner wants to use the ITSFM system to manage non-transportation assets, the agency must buy a sub-license agreement from Byers Engineering Company. Maintaining agencies are responsible for the subscription cost for non-transportation users. The current cost is:

- $4,000 for Sub-Enterprise License fee (one-time charge) plus $800 maintenance fee for the first year,
- $800 maintenance fee for each subsequent year,
- Annual hosting fee based on the number of non-transportation user logins:

User Logins	Annual Cost
1-5	$1,500
6-10	$2,500
11-20	$4,500
21-50	$8,500

- Annual Google map images:

Total Allowed Page Hits	Package Cost
10,000	Free
50,000	$250
100,000	$500
200,000	$1,000

Each maintaining agency or regional partner must meet District's requirements for ITSFM user accounts and support the same positional and quality requirements as the District. **Alexandra Lopez**, TSM&O Program Engineer will serve as the District coordinator with the maintaining agencies and regional partners shown in the following list.

Maintaining Agency / Regional Partner	Primary Contact Name/Phone
FDOT Broward RTMC	Nicole Forest / Nicole.Forest@dot.state.fl.us
City of Boca Raton	Erik D Ferguson/EDFerguson@ci.boca-raton.fl.us
City of Ft. Lauderdale	Lisa Glover/ lglover@fortlauderdale.gov
City of Fort Pierce	Ed Seissiger/ eseissiger@cityoffortpierce.com John Andrews jandrews@cityoffortpierce.com
City of Stuart	Timothy Voelker / tvoelker@ci.stuart.fl.us
City of West Palm Beach	Brett Madison / bmadison@townofpalmbeach.com
Broward County	David Damian/ ddamian@broward.org Yves d'Anjou / YDANJOU@broward.org
Indian River County	JohnAnkeny / jankeny@ircgov.com
Martin County	Damien Bono/ dbono@martin.fl.us
Palm Beach County	Melissa Ackert/ MAckert@pbcgov.org
St. Lucie County	Gene Snedekerg / snedekerg@stlucieco.org
FDOT District Six	Alejandro Motta / alejandro.motta@dot.state.fl.us
Florida Turnpike Enterprise	Eric Gordin / eric.Gordin@dot.state.fl.us

6. User Authorization

The information contained within the ITSFM includes confidential material therefore the District must ensure that all authorized users have passed the Florida Department of Law Enforcement (FDLE) or State Law Enforcement Radio System (SLERS) background check. The District is responsible for supplying written authorization for people to access the ITSFM including:

- District staff, consultants and contractors,
- Regional partners and maintaining agencies, and
- Defining user role (viewer, maintainer, or editor).

The District employee that will verify people have met the security requirements then execute the ITSFM User Authorization is **Alexandra Lopez**, TSM&O Program Engineer .

Fully executed User Authorization will be sent to the Central Office before scheduling user training. The ITSFM instructor will coordinate with each trainee and ensure they have the needed hardware and software before attending all training classes.

It is the District's responsibility to notify the Central Office to deactivate users no longer needing access to the ITSFM system. The Central Office will issue a User Reports upon request.

7. Maintenance Management Software

The ITSFM serves as the statewide database to manage field assets, document system configuration, and as-built documentation. The District also uses maintenance management software that is specifically designed to manage maintenance activities; documents installed and spare assets; log technician response times and repair activities; and monitor the fiber optic network's performance to automatically generate outage notifications. Together, this suite of software applications allows the Department to manage the entire ITS.

The District uses the **Maintenance Inventory Management Systems (MIMS)** software application to manage maintenance activities and inventory installed and spare parts. The District uses **Solarwinds** software application to monitor the fiber optic network's performance.

ITSFM and the other maintenance management software stores data redundant between each system; these data items include but are not limited to:

- Equipment Sites,
- Equipment site components including fiber, communication, and electrical equipment, and
- ITS Devices.

FDOT is committed to having a single central repository for all ITS-related assets within the ITSFM. However, no one system can provide all the business process functionality to all users that require interaction with the ITS facilities data. Interfacing external systems to the ITSFM is necessary to end duplication of efforts, mismatched values in common data fields, and errant data conditions, thus supplying correct reporting of ITS assets for the processes that are dependent on this data. The District plans to deploy the ITSFM-to-MIMS interface developed by District Five for this purpose.

8. Database Management

The District is responsible to manage and maintain the ITSFM database. Asset changes to the system will be updated to the database as shown in the following table or as otherwise decided by the District. The District will use the statewide ITSFM as the **primary** database for storing asset records for field equipment and cables. The District's goal is to supply a highly correct and reliable database for use by the operations and maintenance staff.

The following table defines the entity responsible to maintain the database and within the required timeframe based on work type:

Work Type	Responsible	Timeframe
Routine maintenance and equipment changeouts	Maintenance technicians	Real-time
Fiber connectivity	Fiber optic cable editor	One-week
New Construction	Outside Plant editor	One-month

9. Positional Accuracy

The ITSFM is a geographical information system (GIS) based Web application designed to manage Outside Plant facilities based on their Latitude / Longitude coordinates. All features mapped in the ITSFM shall be based on **sub-meter accurate or better** Global Positioning System (GPS) Latitude / Longitude coordinates. This requirement allows the District to accurately find equipment and ensure the Department can:

- Easily find buried cables, conduit, and access points,
- Export accurate positional data to Google Earth, Shape Files, and CAD,
- Share positional data to mitigate conflicts with other projects and shift replacement or relocation costs from maintenance budget to new project budget.

The District recognizes that accurate positional information is not always available from existing legacy databases and maintenance management tools and will update existing features to include accurate coordinates to provide users with consistent and reliable positional information.

10. Minimum Equipment Requirements

The ITSFM supports a wide range of ITS equipment currently in use by the Department. The following table defines the minimum requirements needed to manage the transportation management system:

Minimum Equipment Requirements	
Field Equipment Types	**Classification**
Cable and Conduit	
Fiber Optic Cables	Required
Fiber Optic Cable Slack Loop	Required
Fiber Optic Cable Splice Location	Required
Video Cable	Required
Data Cable	Required
Composite Cable	Required
Electric Cables	Required
Twisted Pair Copper Cable	Required
Conduit and Access Points	
Conduit Duct Bank	Required
Conduit Attributes	Required
Innerduct Attributes	Required
Access Points	Required
Support Structures	
Pole	Required
Utility Pole	Required
Cantilever	Required
Butterfly	Required
Overhead Span	Required
Mast Arm - Single	Required
Mast Arm - Double	Required
Pedestrian Pole	Required
2-post sign	Required
Equipment Sites	
Regional Transportation Management Center	Required
Transportation Management Center	Required when Applicable
Communication Facility Sites	Required
Electric Sites	Required
Utility Demarcation Sites	Required
ITS Equipment Cabinet Sites	Required
Signal Equipment Sites	Required
Toll Equipment Sites	Required when Applicable

Minimum Equipment Requirements	
Field Equipment Types	**Classification**
ITS Devices	
All ITS Equipment Types	Required
All Signal Equipment Types	Required when Applicable
Fiber Equipment	
All Fiber Equipment Types including but not limited to Ethernet Switch/Routers, Patch Panel, Modem, etc.	Required
Fiber & Communication Equipment	
All Communication Equipment Types including but not limited to ITS Device Controller, Radios, Terminal Servers, Media Converters, etc.	Required
Electric Equipment	
All Electric Equipment Types including but not limited to Uninterruptible Power Supply, Batteries, Surge Protection Devices, Power Supplies, Power Management Units, etc.	Required

The definition for each classification is as follows:

Required – This feature is necessary to manage the transportation management system and must be populated and supported in the ITSFM system.

Required When Applicable – If deployed, this feature is necessary to manage the transportation management system and must be populated and supported in the ITSFM system.

Optional – This feature is optional and can be stored in the ITSFM if available.

11. Minimum Attribute Requirements

The ITSFM supports many types of ITS equipment with each type having different attributes to describe the unique characteristics of the equipment. District Four needs ITS equipment to be attributed to the maximum extent practical. In some cases, it may not be feasible or practical to capture all attributes for existing equipment during the initial ITSFM data population. In these cases, missing attribution will be collected and encoded into the ITSFM database during the equipment's next maintenance or replacement cycle.

12. Document Management

The ITSFM allows important system documentation (photo, as-built plans, cut sheets, etc.) to be attached or linked to all feature types in the database. This makes information remotely available to all system users thereby ending the need for users to know exactly which project or maintenance activity built, installed, or changed the equipment because the records are available based on geographic location. District Four needs the following records documented in the system and available to the operation and maintenance field staff.

Document Library		
Storage Location	**Document Type**	**Classification**
Equipment Cabinet:	Communication wiring schematics	Required when Applicable
	Electrical wiring schematic	Required when Applicable
	Equipment cut sheets	Optional
	Photographs:	
	• General site view	Required
	• Equipment cabinet with the front door open	Required
	• Equipment cabinet with the rear door open	Required
	• Each Fiber Device (Ethernet Switch, Patch Panel, etc.) clearly showing terminations	Required
	• Each ITS Controller (Encoder, DMS controller, etc.)	Required
	• Each Communication Device (Media Converter, Terminal Server, etc.)	Required
	• Each Electric Device (UPS, Power Management, etc.)	Required
Electric site:	Electrical wiring schematic	Optional
	Photographs:	
	• General site view	Required
	• Panel/Enclosure with front lid or door open	Required
	• Surge Protector	Required when Applicable
	• Transformer	Required when Applicable
	• Power Meter	Required when Applicable
	• Transfer Switch	Required when Applicable
	• Generator	Required when Applicable
Communication facilities:	Communication wiring schematics	Optional
	Electrical wiring schematic	Optional
	Equipment cut sheets	Optional
	Photographs:	
	• General site view	Required
	• Outside view of the facility	Required
	• Inside View of the facility	Required
	• Each Fiber Device (Ethernet Switch, Patch Panel, etc.) clearly showing terminations	Required
	• Individual components as needed to provide detail and clarity	Optional
Equipment racks:	Equipment rack details	Required
	Photographs:	
	• Rack name clearly labeled on the front of the rack	Required
	• Rack with the front door open	Required

Document Library		
Storage Location	**Document Type**	**Classification**
	• Rack with the rear door open	Required
	• Individual components as needed to provide detail and clarity.	Optional
ITS Field Device:	• Cut sheets	Required
	• Photographs:	
	• Individual ITS field device with the support structure	Required
	• Others as needed to provide detail and clarity	Optional
Fiber splice vaults:	As-built plan sheets with coverage between adjacent fiber splice vaults	Required
	Photographs:	
	• General site view	Optional
	• Inside view	Optional
Fiber Cables:	• Fiber usage agreement attached to the optical fiber path	Required when Applicable