ITS Project Scoping Methodology

*The purpose of this document is to provide additional guidance to aid in scope development for projects that contain an ITS component.*

## Does the project involve ITS?

If the project involves ITS, it needs to go thru the systems engineering risk assessment checklist to determine if it is a high or low risk project, as per 23 CFR 940. **(Note: Signalization is considered ITS so signal projects need to go through the checklist.)**

If you do not have the SE and ITS Architecture Procedure and risk assessment checklist documents and need a copy please email [Katie.King@dot.state.fl.us](mailto:Katie.King@dot.state.fl.us) to get them.

Additionally, these form and samples of SE documents completed are available for reference online at <http://www.cflsmartroads.com/projects/systems_engineering.html>

## Is the Project Low Risk or High Risk?

Screen should be done as part of the intake process, and not in design.

**Low-Risk:** If the project is deemed low risk then the filled out Appendix A form should be sent to [Katie.King@dot.state.fl.us](mailto:Katie.King@dot.state.fl.us) to put on file for auditing purposes.

**High-Risk:** If the project is deemed high risk then hours should be included in the scope for the EOR to develop the Systems Engineering documents that will be needed for the project.

## High-Risk Language for Scope:

This project has been identified as High-Risk, using Florida Statewide and regional ITS Architecture per Florida Procedure No. 750-040-003. The EOR is responsible to produce all regulatory Systems Engineering (SE) analysis items in 23 CFR 940.11. This includes the Systems Engineering Project Checklist in Appendix B and includes the following minimum SE supporting documentation:

1. Project Systems Engineering Management Plan (PSEMP);

2. Concept of Operations;

3. Analysis of Alternative System Configurations and Technology Options;

4. High-Level System Requirements;

5. Requirements Traceability Verification Matrix;

6. List of ITS Standards;

7. System Verification Plan;

8. System Validation Plan;

9. System Acceptance Plan; and

10. Operations and Maintenance Plan

The EOR is responsible to verify if the final ITS project design is consistent with the RITSA, if the project is inconsistent with the RITSA, then the EOR must update the RITSA.

## Is the project new construction?

For new construction projects the placement of fiber, cctv, mvds, or other ITS devices should according to MPO/TPO ITS master plan. Master Plans are available online using the following link:

http://www.cflsmartroads.com/projects/Project\_approvedmasterplans.htm

## Does the ITS Project Need Proprietary Product Certifications?

Depending on the maintaining agency and equipment being installed proprietary product forms and justification letters may be required for the project.

Some examples of items that could need Proprietary Product certification forms are listed below:

* 1. MVDS
  2. ITS Cabinet Locks
  3. UPS
  4. ATMS Traffic Signal Control System Modules
  5. GPS Preemption for Emergency vehicles or transit signal priority
  6. Wireless Magnetometer Sensors
  7. Adaptive Signal Control
  8. Traffic Signal Controllers and Cabinets
  9. Traffic Signal Vehicle Detection Systems
  10. CCTV cameras
  11. Bluetooth Devices

The following link has examples of completed and signed proprietary product certifications and justification letters for reference.

<http://www.fdot.gov/programmanagement/ProductEvaluation/ProprietaryProducts/ProprietaryList.shtm>

<https://lappc.cflsmartroads.com/>

## Proprietary Product Language for Scope:

The engineer shall verify if any proprietary products certification is necessary for the project, as defined in 23 CFR 635.411. If a product is deemed necessary for project synchronization with existing facilities, or is a unique product for which there is no suitable alternative, then the EOR is responsible to coordinate and prepare any necessary product justification letters with maintaining agency for the certification process.

## Is the project a capacity project?

Contact the ITS Department to coordinate scope.

[Jeremy.Dilmore@dot.state.fl.us](mailto:Jeremy.Dilmore@dot.state.fl.us) and [Tushar.Patel@dot.state.fl.us](mailto:Tushar.Patel@dot.state.fl.us)

## Does the project have ITS Review?

For project review in the ERC please assign Katie King, Jim Miller, and Ray Marlin as reviewers.

*The following section provides guidance for language to include in a Project Scope by the type of work involved in other disciplines. Projects that have this type of work may not list having ITS in the initial project request, however the nature of the work being done could impact existing ITS facilities within the project limits.*

## Does the project include pavement work on the interstate?

(Example: Milling and Resurfacing Projects)

THIS LANGUAGE ONLY APPLIES TO ITS DETECTION SITES ON FREEWAYS. IT DOES NOT APPLY TO ARTERIAL PTMS OR ANY TTMS COUNT STATION SITES. CONTACT [cheryl.burke@dot.state.fl.us](mailto:cheryl.burke@dot.state.fl.us) TO DETERMINE IF THE SITE IS A PTMS OR TTMS SITE BEFORE ADDING THIS SCOPING LANGUAGE.

## Scope Language for Projects that have pavement work on the Interstate

The engineer shall verify if any ITS detection sites are present within the project limits. If detection sites exist within the project limits then ITS plans shall be designed to ensure that existing detection is maintained, within the project limits. These plans shall include but not be limited to:

• Existing sites with loops shall be replaced with MVDS.

• If existing MVDS are present, the MVDS shall be adjusted with MOT shifts to insure

continued levels of detection.

• Submittal of Proprietary Products form is required to allow for future compatibility with

wrong way detection for all new MVDS.

If existing ITS systems in the project limits have Uninterruptible Power Supplies (UPS), plans shall include the replacement of the existing batteries.

## Does the project include removal of existing strain pole, utility pole removal, or underground work below 24” (for example: inlet and manhole placement, guardrail setting, multipost sign placement, etc).

## Scope Language for Projects with underground work in the areas where Single Mode and Multimode Fiber are present

FDOT Fiber Optic Cable is in the area of the underground work for this project.  The EOR is responsible to designate the fiber location in the plans and to determine if there is a conflict and to resolve the conflict.  No additional splices may be introduced into the cable.  If the fiber removal and installation of a new cable is needed the designer shall:

* Verify the location existing full termination splices
* Verify existing drop cable splicing
* Determine if Multimode and/or Single Mode FOC is in use
* If Multimode is in use:
  + Coordinated with Multimode user(s) to migrate to Single Mode
  + If Multimode is to continue.
    - Develop a MM TSP (requiring both 50 micron and 62.5 micron)
    - Provide a 24/12/12 or existing cable whichever is larger.
* If Single Mode only is to be used provide a 72SM or existing cable whichever is larger
* Coordinate with cable users for allowable downtime.  The users include:

Customize to the project area; please note that jurisdictional boundary are often exceeded within ITS; example Seminole County has communication along SR 436 all the way to SR 408. Call Tushar Patel and/or Katie King for guidance

* + Orange County
  + City of Orlando
  + FDOT
* Provide plan sheets that
  + Restrict downtime
  + Present a Maintenance of Communication plan meeting the downtime requirement
  + Require a single uninterrupted cable will be used
  + Reflect splices for all drops cables to return existing functions

**Fiber in the area (from map) of Underground Work in areas with Single Mode only (Lake County, Marion County, Osceola County, Flagler County, Sumter County, and Seminole County)**-Contact Tushar Patel (x5315) or Katie King (x5333) for guidance.

## Scope Language for Projects with underground work in the areas where Single Mode only Fiber is present

FDOT and (\_\_\_\_\_\_\_) County Fiber Optic Cable is in the area of the underground work (guardrail setting and multipost signs, etc) for this project.  The EOR is responsible to designate the fiber location in the plans and to determine if there is a conflict and to resolve the conflict.  No additional splices may be introduced into the cable.  If the fiber removal and installation of a new cable is needed the designer shall

         Verify the location existing full termination splices

         Verify existing drop cable splicing

         If Single Mode only is to be used provide a 72SM or existing cable whichever is larger

         Coordinate with cable users for allowable downtime.  The users include:

Customize to the project area; please note that jurisdictional boundary are often exceeded within ITS; example Seminole County has communication along SR 436 all the way to SR 408. Call Tushar Patel and/or Katie King for guidance

o   Seminole County

o   FDOT

         Provide plan sheets that

o   Restrict downtime

o   Present a Maintenance of Communication plan meeting the downtime requirement

o   Require a single uninterrupted cable will be used

o   Reflect splices for all drops cables to return existing functions

## Does the Project involve Trails in Seminole County?

Seminole County installs fiber optic cable along trails in their region.

## Scope Language for Trail Projects in Seminole County

Seminole County installs Fiber Optic Cable along trails within the County.  The engineer is responsible to design ITS plans for new cable installation. Examples of design plans and details from model ITS Projects are available online for reference at <http://www.cflsmartroads.com/projects/design_plans_production.html#modelprojects>

## Does the Project involve Landscaping?

## Scope Language for Projects that include landscaping:

The engineer shall verify if any ITS devices are present within the project limits. If present within the project limits, the EOR is responsible to provide and maintain proper site distance for all ITS device locations.

* Provide plan sheets that:
  + Present a Maintenance of Communication plan meeting the site distance requirements.

## Does the Project involve a new signal?

## Scope Language for Projects that include a new signal:

The engineer shall verify if the new signalized intersection is within the limits of an interconnected corridor. If interconnect exists within the existing corridor, then the engineer is responsible to design a drop to the new cabinet and to verify that enough slack exists to provide the drop cable without introducing a new full termination splice location. If slack is not available, no additional splices may be introduced into the cable.  If the fiber removal and installation of a new cable is needed the designer shall

         Verify the location existing full termination splices

         Verify existing drop cable splicing

         If Single Mode only is to be used provide a 72SM or existing cable whichever is larger

         Coordinate with cable users for allowable downtime.  The users include:

Customize to the project area; please note that jurisdictional boundary are often exceeded within ITS; example Seminole County has communication along SR 436 all the way to SR 408. Call Tushar Patel and/or Katie King for guidance

o   Seminole County

o   FDOT

         Provide plan sheets that

o   Restrict downtime

o   Present a Maintenance of Communication plan meeting the downtime requirement

o   Require a single uninterrupted cable will be used

o   Reflect splices for all drops cables to return existing functions

The engineer shall design the new signal to be a smart signal compatible with the districtwide ATSPM database and future compatibility for CV including enhanced detection. The smart signal design shall include:

         Provide plan sheets that include:

o   Stop bar detection for all lanes of the intersection which will provide 1 min batch Turning Movement Counts.

o   Advance detection for all lanes of the intersection (including turn lanes).

o   Communication between the controller and ATSPM system.

o   ATC controller that are compatible with the maintaining agencies ATMS software, capable of high-resolution data logging and are forward compatible with CV and ICM expansion efforts.

* Upgrade to the existing cabinet to Type 6, TS-2, Type 1 with 64 channels if it is not already of this type.
* Provide detector channel designation details within the plans.

        Provide any MSP/TSPs necessary to require submission of the signal field inventory application prior to Final Acceptance of construction for approval of the department and entry into the ATSPM system.

The designer is not to use plan notes to ensure compatibility with existing ATMS.  Proprietary Product Certification process shall be used.

## Does the Project involve modification of existing signalized intersection detection or impact the existing traffic signal cabinet?

## Scope Language for Projects that include modification to an existing signal:

The engineer shall design the new signal detection and traffic signal controller to be a smart signal compatible with the districtwide ATSPM database and future compatibility for CV including enhanced detection. The smart signal design shall include:

         Provide plan sheets that include:

o   Stop bar detection for all lanes of the intersection which will provide 1 min batch Turning Movement Counts.

o   Advance detection for all lanes of the intersection (including turn lanes).

o   Communication between the controller and ATSPM system.

o   ATC controller that are compatible with the maintaining agencies ATMS software, capable of high-resolution data logging and are forward compatible with CV and ICM expansion efforts.

* Upgrade to the existing cabinet to Type 6, TS-2, Type 1 with 64 channels if it is not already of this type.
* Provide detector channel designation details within the plans.

        Provide any MSP/TSPs necessary to require submission of the signal field information form prior to Final Acceptance of construction for approval of the department and entry into the ATSPM system.

The designer is not to use plan notes to ensure compatibility with existing ATMS.  Proprietary Product Certification process shall be used.

## Does the Project involve sidewalk and/or curb cut ramps being installed or replaced?

## Scope Language for Projects that include sidewalk/curb cut ramp work:

The engineer shall verify if any existing pullboxes are present within the project limits. If present within the project limits, the EOR is responsible to provide ITS/Signalization plans for the replacement of the pullboxes. Relocation of pullboxes is not allowed.

* Provide plan sheets that:
  + Show the replacement of pullboxes within the limits of sidewalk and/or curb cut ramp work.

## Does the Project involve existing conduit to be reused for temporary or permanent signal cable, fiber optic cable, or any other type of transportation cable?

## Scope Language for Projects that include use of existing conduit:

If an existing conduit greater than 1,000 ft in length is to be reused for temporary or permanent signal cable, fiber optic cable, or any other transportation cable, the engineer is responsible to proof during design. Please contact Patrick White (321) 257-7200 for coordinating the mobilization of a contractor to proof the conduit. The design shall document the proofing testing including, time, date, attendees, and results by conduit run, dowel size, and conduit size. This information shall be part of the design documentation.

## Is this project within the limits of a Connected Vehicle deployments

Anything in the limits of 440413-1-52-01: CV Pilot on SR 434, 440821-1-52-01: PedSafe Greenway Deployment, or 440900-1-52-01: I-75 FRAME intersections.

Check the Proposed CV locations KMZ file. These locations have electronic map messages tied to the physical intersection geometry. Any change to intersection geometry (examples: crosswalk location movement, turn lane extension, changed lane width, etc.) will require updated map message survey information scoped.

## Scope Language for Projects that are within a Connected Vehicle Deployment area

This project is within the limits of an existing Connected Vehicle (CV) project. Future projects in areas with connected Vehicle technology will have to be updated to indicate changes in geometry. This will include temporary changes due to Temporary Traffic Control as project that will update the geometry on the intersections and/or intersection approaches. Strong consideration for construction activities is recommended, either update Map messages or unplug the CV device to avoid wrong messages during construction. For projects where geometry changes will take place Technical Special Provisions for the contractor to update Map messages for TTC and permeant condition need to be prepared by the EOR.

* **Intersection Geometry Changes** – *Connected Vehicles (CV) Map Messages* for the RSU(Road Side Units) need to be updated to work with the new geometry and during the MOT. Projects with Geometry changes after CV deployments projects have to update the Map Messages.
  + Apply to any change to intersection geometry(crosswalk locations movements, turn lane extension, change lane width, etc.) will required Updated Map Messages.
* **MOT** – *Map messages* need to be updated during and after MOT for the RSU - BSM(Basic Safety Messages) to work during and after construction. The CV technology need to provide correct information to the traveling public.
  + Provide KMZ file (GIS enable) of proposed changes- with pavement marking (proposed crosswalk changes at intersection).
  + Define lanes, approaches and crosswalk on ISD Message(<https://webapp.connectedvcs.com/> ) and provide information link to the Department (attached is a request access to CV tools example and Clay is working on a video for the CV tools)
  + Add a note for the contractor to contact ITS two weeks in advanced of the beginning of his work and inform about the existing CV devices(Map messages Update needs).

## Does the Project involve modification to an existing signal geometry or detection for a signal that is in the ATSPM system?

## Scope Language for Projects that include modification to intersection geometry or intersection detection in the ATSPM system:

This project has intersections within the districtwide ATSPM system. The engineer shall:

* + Provide any MSP/TSPs necessary to require submission of the signal field inventory information using the Signalized Intersection Inventory Application (SIIA) prior to Final Acceptance of construction for approval of the department and entry into the ATSPM system.