

Program Responsibilities, Intelligent Transportation Systems (ITS)/Operations

Background

➤ **Intelligent Transportation Systems (ITS)**

Federal regulations (23 CFR 940) define ITS as "...electronics, communications, or information processing used singly or in combination, to improve the efficiency or safety of a surface transportation system." This is a broad definition, covering the range from small, simple devices up to large and complex systems. In addition to this definition, ITS systems should include comprehensive management strategies and apply technologies in an integrated manner. The purpose of ITS integration is to share information and reduce redundant spending between jurisdictions. ITS integration includes both technical and inter-agency aspects of system development. An ITS Project is defined as "any project that in whole or in part funds the acquisition of technologies or systems of technologies that provide or significantly contribute to the provision of one or more ITS user services as defined in the National ITS Architecture."

Funding Programs

➤ **CMAQ**

Section 1808 of SAFETEA-LU expands eligibility of projects or programs that improve transportation systems management and operations that mitigate congestion and improve air quality. This could include establishment or operation of a traffic monitoring, management, and control facility. Projects that improve traffic flow, including efforts to provide signal systemization, streamline intersections, improve transportation systems management and operations that mitigate congestion, improving incident and emergency response and real time traveler information are also eligible.

➤ **NHPP**

The National Highway Performance Program supports funding for capital and operating costs in the ITS program area. Capital and operating costs for traffic and traveler information monitoring, management, and control facilities and programs are eligible using NHPP funds. In addition, infrastructure-based intelligent transportation systems capital improvements (project or activity must be associated with the NHS) are eligible under this program.

➤ **STBG**

The Surface Transportation Block Grant provides Federal-aid eligibility for capital and operating costs for traffic monitoring, management, and control facilities and programs. The STBG is also eligible for infrastructure-based ITS capital improvements.

Types of ITS Projects

➤ **Major Intelligent Transportation Systems Projects (both NHS and non-NHS)**

A major ITS project is one that implements in whole, or a part, of a statewide or local agency ITS initiative that is new technology, multi-jurisdictional, multi-modal, or affects statewide or local agency integration of ITS systems. A major ITS project has **one (or more)** of the following characteristics:

- 1) Multi-jurisdictional or multi-modal
- 2) Custom software is required
- 3) Hardware and communications are "cutting-edge" or not in common use
- 4) New interfaces to other systems are required
- 5) System requirements are not detailed or not fully documented
- 6) Operating procedures are not detailed or not fully documented

7) Technology service life shortens project life-cycle

The project manager must submit a Systems Engineering (SE) Analysis Form (SEAFORM) for further determination by the FHWA. Upon approval of the SEAFORM, the project manager must submit a Systems Engineering Management Plan (SEMP) to the FHWA for approval to advance to final design for all major ITS projects classified as a Project of the FHWA division Interest.

➤ **Minor ITS Projects**

Minor ITS projects do not require a Systems Engineering Management Plan approval by the FHWA. However, a SEAFORM must be filled out and approved prior to Preliminary Engineering.

Minor ITS projects are often referred to as ITS infrastructure expansion. Standard Plans, Standard Specifications, and Standard Special Provisions are well documented. These projects will have all the following characteristics:

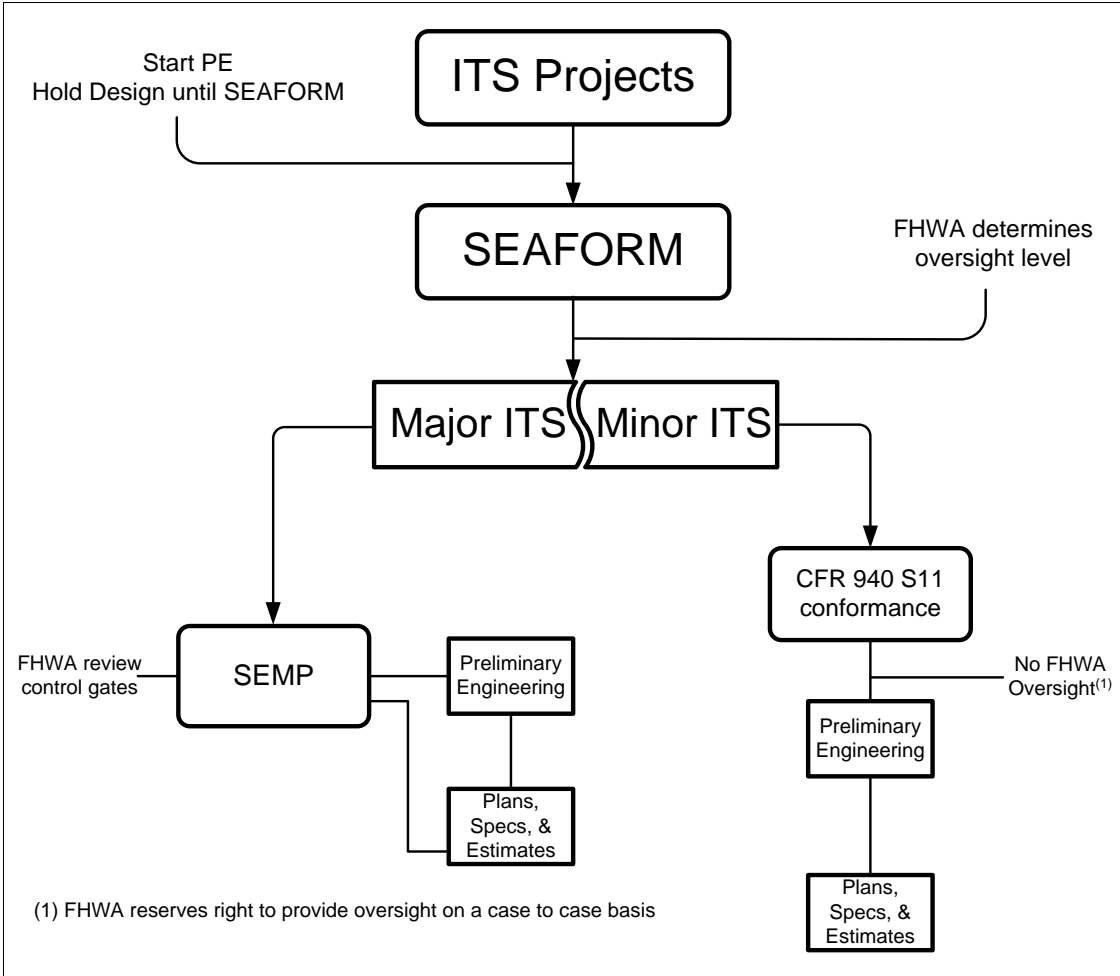
- 1) Single jurisdiction; single transportation mode (highway, transit or rail)
- 2) No software creation; commercial-off-the-shelf (COTS) or proven software
- 3) Proven COTS hardware & communications technology
- 4) No new interfaces
- 5) System requirements fully detailed in writing
- 6) Operating procedures fully detailed in writing
- 7) Project life-cycle not shortened by technology service life

Projects that fit the above definition and characteristics are “minor” ITS projects regardless of project costs. It should be recognized that, although there may be no “formal” Systems Engineering requirements, good procurement practices should ensure the development of detailed systems requirements and specifications plus a thorough acceptance plan. These items are elements of the SE process; hence, this is one example of scaling down the SE process to fit the needs of a minor project.

Operating Procedures

All ITS projects shall follow the process flow diagram shown in Figure 3. Application and control of the SE process is a key element of the PE process on ITS projects. Federal-aid ITS projects shall follow the regular Federal-aid procedures as detailed in the Project Oversight Chapters. The completion of the SEAFORM prior to PE obligation and authorization procedure assures conformity with 23 CFR 940.

Figure 3: PE Process for Intelligent Transportation Systems



Major ITS Projects - Procedures

1. The Project Manager (PM) forwards the SEAFORM to the FHWA for concurrence and oversight determination.
2. The FHWA reviews the SEAFORM for the FHWA oversight determination, comments on the SEAFORM, and sends the information back to the PM.
3. The PM revises the SEAFORM upon receipt from the FHWA. If the project is determined to be a Major ITS project and a Project of the FHWA division Interest, the PM will submit a SEMP and the Systems Engineering process to the FHWA for review and approval.
4. The FHWA notifies the PM that they approved the SEMP and Systems Engineering process.
5. Upon receiving final SEMP and process product(s) approval, the PM may proceed with PE.

➤ Construction

1. If the ITS project includes activities defined as construction; the PM must submit a PS&E package requesting construction authorization. The request includes the necessary Federal-aid paperwork and requirements in accordance with 23 CFR 635.
2. Beyond this point, normal Federal-aid procedures apply for completing the project.

➤ Minor ITS Projects - Procedures

The procedures for minor ITS projects will follow the traditional Federal aid PE procedures. ITS documentation remains a requirement in accordance with the CTDOT oversight requirements. However, no SEMP review and the FHWA review are required.

1. The Project Manager (PM) forwards the SEAFORM to the FHWA for concurrence and oversight level.
2. The FHWA reviews the SEAFORM for the FHWA oversight determination, comments on the SEAFORM, and sends the information back to the PM.
3. The PM revises the SEAFORM upon receipt from the FHWA. If the project is determined to be a Minor ITS project, the PM will proceed with PE.

➤ ITS in Traditional Roadway and Other Federal-aid Projects

The procedure for any ITS elements in traditional roadway or other Federal aid projects shall follow the Operating Procedures described above.

Project Oversight

➤ ITS Regional (Statewide) Architecture – 23 CFR 940.9

The applicable regulation for ITS projects is contained in 23 CFR 940, entitled Intelligent Transportation System Architecture and Standards. This regulation requires States and metropolitan areas to develop regional architectures and to follow a systems engineering process for ITS project development whenever Federal-aid funds are utilized for ITS deployment. ITS projects are defined in 23 CFR 940.3.

Connecticut has developed a Statewide architecture in accordance with the requirements in 23 CFR 940.9. This Statewide architecture shall be a guide to the development of ITS projects and

programs, consistent with ITS strategies and projects contained in applicable transportation plans.

The State shall develop and implement procedures and responsibilities for maintaining the regional ITS architecture as needs evolve within the State.

➤ **Project Implementation – 23 CFR 940.11**

All ITS projects funded with highway trust funds shall be based on a systems engineering analysis, and the analysis should be on a scale commensurate with the project scope.

The systems engineering analysis shall meet the minimum requirements in 23 CFR 940.11, (c), (1) to (7).

All ITS projects entering final design shall accommodate the interface requirements and information exchanges as specified in the Statewide ITS architecture. If the final design is inconsistent with the Statewide architecture, then the Statewide architecture shall be updated as provided in 23 CFR 940.9.

All ITS projects funded with highway trust funds shall use applicable ITS standards and interoperability that have been adopted through rulemaking by the USDOT.

➤ **Project Administration – 23 CFR 940.13**

Prior to the authorization of highway trust funds for the construction or implementation of ITS projects, compliance with 23 CFR 940.11 shall be demonstrated.

Compliance with this part will be monitored under Federal-aid oversight procedures as provided in 23 U.S.C. 106 and 133.

Determinations if the Project is of the FHWA Division Interest (PODI) for ITS projects, and the FHWA approval authority will be accomplished in accordance with the framework in the Project Oversight, Project Development, and Project Construction Chapters. These determinations will also consider the process flow for ITS projects described in the “Operating Procedures” section for determining the FHWA oversight on a project case by case basis.

Program Evaluation

Periodic review of Operating Procedures between the FHWA and the CTDOT may be conducted, when necessary, to identify areas for greater efficiency and improvements to the ITS program.

The SEAFORM and SEMP approvals shall be tracked and compared to provide exemplary practices.

Operations Program Activities

Operations program activities are eligible for funding with the use of NHPP and STP Federal-aid funds and also with the use of CMAQ funds for a period not to exceed three years from the date of deployment of an ITS system or project. Operations projects are approved and authorized for Federal-aid funding using regular Federal-aid procedures. The CTDOT and other State agency operations activities below have been previously approved for Federal-aid funding by the Connecticut Division.

The CTDOT will utilize Federal-aid funds to operate the Newington and Bridgeport Highway Operations Centers (HOC). These centers are staffed by system operators on a 24 hour-a-day/7 day-a-week basis. Consultant staff responsible for operating the Bridgeport HOC are procured using the CTDOT's qualifications based selection process. In addition, engineering staff in the CTDOT Office of Highway Operations will charge their payroll to these Federally-funded projects when working on Operations Center assignments or tasks.

Staff that operate and maintain the CTDOT CHAMP service patrol vehicles will charge their payroll to the Federally-funded Highway Operations Center projects, as appropriate. In addition, Office of Maintenance personnel that respond to after-hour calls involving traffic incidents or traffic signal malfunctions will continue to charge their time to the Highway Operations Center projects.

Federal funds will continue to be provided to the Connecticut State Police for the provision of enhanced incident management patrols along the I-95 Corridor in southern and southwestern Connecticut. These patrols ensure the timely response and clearance of traffic incidents along this corridor.

References

- ✓ SAFETEA-LU Sections: 1201, 1808, 5101(a), 5211, 5305, 5306, 5310(8)
- ✓ 23 U.S.C. 103, 149, 511
- ✓ 23 CFR 940

Table 20: ITS Process Summary for Projects

Activity	CTDOT ACTION	FHWA ACTION	Remarks
SEAFORM and/or SEMP for Systems Engineering Analysis Process	Prepare & Submit	Review and Approve (14 Days)	Begin Preliminary Engineering
Copies of all project reports, quarterly progress reports, correspondence, meeting announcements and minutes	Prepare & Submit for PODI Only	Information	Reports and Updates
Update Regional ITS Architecture	Prepare & Submit	Information	Updated Regional ITS Architecture
ITS Design Project Submittals	<i>See Project Development and Project Construction Chapters</i>		
ITS Construction Project Submittals			

ITS Process for Programs

Activity	Authority	CTDOT ACTION	FHWA ACTION	Remarks
Traffic Incident Management Self-Assessment	Annual Memo from HQ	Complete annually with the FHWA by August 1	Submit to HQ	
Intelligent Transportation System Architecture & Standards	23 CFR 940	Prepare & Submit	Review and Approve	