Local Programs Procedures

LPP 10-01 Manual Update
Subject: Intelligent Transportation Systems (ITS) Program

Reference: *Local Assistance Program Guidelines,* Chapter 13-Intelligent Transportation Systems (ITS) Program, Chapter 12-Other Federal Programs, and Appendix B-Financing the State Funded Highway Program;
Local Assistance Procedures Manual, Chapter 2-Roles and Responsibilities, Chapter 3-Project Authorization, Chapter 7-Field Review, and Chapter 11-Design Standards.

Effective Date: April 30, 2010 Approved: _____

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WHAT IS AN LPP?

LPPs are Local Programs Procedures. These documents are used for the deployment of new procedures and policies between updates of Local Assistance manuals, guidelines and programs. They are numbered according to calendar year and order in which released. This is the first LPP issued in 2010, hence it is LPP 10-01.

PURPOSE

The purpose of this LPP is to provide updated guidance on the Intelligent Transportation Systems (ITS) Program, issued in its entirety as Chapter 13 (originally Section 12.6, "Intelligent Transportation Systems") of the *Local Assistance Program Guidelines* (LAPG). The original Chapter 13, "Financing the State Funded Highway Program", is renamed as "Appendix B" of LAPG. The revision also includes Chapter 2, "Roles and Responsibilities", Chapter 3, "Project Authorization", Chapter 7, "Field Review", and Chapter 11, "Design Standards", of the *Local Assistance Procedures Manual* (LAPM).

BACKGROUND

Newly issued Chapter 13 "Intelligent Transportation Systems (ITS) Program," of the LAPG contains ITS program guidelines local agencies must follow to be in compliance with the CFR 940, "Intelligent Transportation System Architecture and Standards", and other federal ITS related laws. Failure to comply with these federal regulations will render the local agency federal-aid transportation project ineligible for federal reimbursement. The ITS Program Guidelines establish the roles and responsibilities of local agencies, Caltrans District Local Assistance Engineers (DLAEs), Division of Local Assistance (DLA) Implementation Area Engineers and ITS Program Coordinators. It also provides the procedural steps for ensuring compliance by the most efficient means possible.

PREVIOUS PROCEDURE

March 19, 2004 ITS program guidelines were issued by DLA as the first ITS Program Guidelines in the state. It helped local agencies to handle Federal-aid ITS programs. However, some parts of the guidelines, such as "National Architecture", had little connection with the guidelines themselves. The definition of minor ITS projects was not clear, while some minor ITS projects did not have ITS components.

NEW PROCEDURE

The "ITS Program Guidelines" have been rewritten to clarify the duties of local agencies, DLAEs, DLA Implementation Area Engineers, and ITS coordinators. A new category of ITS project, "exempt" ITS project, has been added into the guidelines. The relation between risks of systems engineering and project types were investigated. The "Major" and "Minor" ITS Projects were referred as "High-Risk" and "Low-Risk" ITS Projects based on the risk evaluation, while both terms are used in this ITS Program Guidelines.

Major changes are:

- Chapter 13 is issued as "Intelligent Transportation Systems (ITS) Program", while the original Chapter 13 "Financing the State Funded Highway Program" is renamed as Appendix B and moved to the back of the LAPG.
- New Exhibits 13-A for High-Risk ITS projects and 13-B for Low-Risk ITS projects are added, while Exhibits 12-C through 12-F are deleted.
- System Engineering Report Form (SERF), Exhibit 7-I of the LAPM, is revised.
- Minor changes related to ITS projects are made in Chapters 2, 3, 7 and 11 of the LAPM, while related Exhibit 7-B in Chapter 7 is also updated.

UPDATE NOTIFICATION

- To receive electronic notification when new information is posted on the DLA website, please subscribe to the DLA list server at: http://www.dot.ca.gov/hq/LocalPrograms/sub.htm.

SUMMARY OF CHANGES

LAPG Item	**Change**
Chapter 13, Table of Contents	Reissued as "Intelligent Transportation System(ITS) Program". Original Chapter 13 "Financing the State Funded Highway Program" is renamed as Appendix B.
Chapter 13	Reissued in its entirety as Intelligent Transportation Systems (ITS) Program. Original Chapter 13 "Financing the State Funded Highway Program" is renamed as Appendix B.
Exhibit 13-A, pages 13-29, 30	New exhibit—Process Flowchart High-Risk (formerly "Major") ITS Project
Exhibit 13-B, pages 13-31, 32	New exhibit— Process Flowchart Low-Risk (formerly "Minor") ITS Project
Chapter 12, Table of Contents	Table of Contents was modified to reflect deletion of section 12.6 and exhibits 12C~12F.
Section 12.5 (Defense Access Roads), page 12-15, 16	Pages were modified for deleted section 12.6.
Section 12.6 (Intelligent Transportation Systems), page 12-16	The whole section was deleted. Chapter 13 (LAPG) was reissued as "Intelligent Transportation Systems (ITS) Program".
Exhibit 12-A and 12-B, pages 12-17 thru 20	Footers were changed to reflect page number changes due to deletion of Section 12.6.
Exhibits 12-C, D1, D2, E F, (original) pages 12-53 thru 83	Three exhibits were deleted and two of them modified and moved to Chapter 13 of the LAPG.
Appendix B	Original Chapter 13 "Financing the State Funded Highway Program" is renamed as Appendix B and moved to the back of the manual.
LAPM Item	**Change**
Chapter 2, Section 2.7 (FHWA Responsibilities), page 2-7	Definition of ITS projects is updated.
Section 2.9 (City, County and other Local Public Agency Responsibilities) page 2-10	Under "Project Implementation," added in the bulleted list the preliminary classification of High-Risk, Low-Risk, or Exempt ITS projects.
Exhibit 2-B, page 2-15	Under "Activity" column, added the activity "Approve SEMP for High-Risk ITS Projects".
Chapter 3, Section 3.2 (Prior to Federal Authorization), pages 3-7, 8	Added second paragraph in regards to ITS Projects and reference to Chapter 13 "Intelligent Transportation Systems (ITS) Program," of the LAPG. The last line of page 3-7 shifted to page 3-8.
Section 3.3 (Request for Authorization), pages 3-9, 10	Modified the whole section "Intelligent Transportation Systems". Under "Construction and Construction Engineering", updated the ITS project activities related to construction.

Section 3.12 (References), page 3-20	Added one new reference "Title 23 CFR 940, National ITS Architecture".
Exhibit 3-A, pages 3-21, 22a	"Major ITS projects" is replaced by "High-Risk (formerly "Major") ITS Projects" in "Request for Authorization Package". Added the requirement for SERF (exhibit 7-I) for High-Risk and Low-Risk ITS projects.
Exhibit 3-F, page 3-37	Under "FHWA Oversight", updated the role of FHWA Oversight.
Exhibit 3-G, page 3-41	Under "Federal Project Log Sheet (Minimum Requirements)," added column for 'SERF' ITS Projects, after column "E76".
Chapter 7, Section 7.1 (Instruction) page 7-3	Modified the 6th bulleted item for ITS projects. Modified classification of ITS projects.
Exhibit 7-B, pages 7-13, 14a	Modified classification of ITS projects and added Check Box for exempt ITS project in item 2. Last sentence of item 5 was changed. "System manager/Integrator" in item 7 was changed as "ITS System Manager or Integrator". Changed "Req'd for ITS projects" to "Req'd for High-Risk (formerly "Major") or Low-Risk (formerly "Minor") ITS projects" on line 4.
Exhibit 7-I, pages 7-27, 28	SERF form was modified.
Chapter 11, Section 11.2 (State wide Design Standards for Local Assistance Projects), page 11-7	Under "Intelligent Transportation Systems/Traffic Signal Controllers," corrected the chapter number for ITS Program Guidelines.

AUTHORITIES AND REFERENCES

- 1991 Intermodal Surface Transportation Efficiency Act (ISTEA)
- 1998 Transportation Equity Act of the 21st Century (TEA-21), Section 5206(e)
- Title 23 USC 103(b)(6), Eligibility for NHS Program
- Title 23 USC 133(b), Eligibility for STP Program
- Title 23 CFR 655, Traffic Operations
- Title 23 CFR 940, ITS Architecture and Standards
- Title 49 CFR 18, Common Rule
- FHWA Memorandum dated March 22, 2002, Guidance on Federal-aid Eligibility of Operating Costs for Transportation Management Systems
- 2002 Project Approval and Oversight Letter of Agreement (Stewardship Agreement) between the Federal Highway Administration and the California Department of Transportation
- January, 2002 Using the National ITS Architecture for Deployment, NHI training course
- Local Assistance ITS Program Website: http://www.dot.ca.gov/hq/LocalPrograms/ITS/ITS.htm
- US DOT ITS Website: http://www.its.dot.gov/

CHAPTER 13 INTELLIGENT TRANSPORTATION SYSTEMS (ITS) PROGRAM

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EXHIBITS

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13-A	Process Flowchart - High-Risk (Formerly “Major”) ITS Projects	13-29
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CHAPTER 13 INTELLIGENT TRANSPORTATION SYSTEMS (ITS) PROGRAM

13.1 INTRODUCTION

These guidelines, "Intelligent Transportation System (ITS) Program", focus on federal-aid Intelligent Transportation Systems (ITS) project development procedures to ensure compliance with the federal ITS regulations, per Code of Federal Regulations (CFR), Chapter 23, Section 940 (23 CFR 940) entitled "Intelligent Transportation System Architecture and Standards." In addition, these procedures establish the roles and responsibilities for all parties who are involved in the federal-aid ITS process.

13.1.1 GUIDELINES OVERVIEW - ROADMAP TO ITS COMPLIANCE

The application and oversight process for ITS projects is different in some significant ways from the traditional roadway construction process. Because of this difference, many ITS projects have **not** been successful. This is especially true of ITS projects that involve something **new**, which the lead agency has not done before. This might include new technology or new software or new communications, or joint efforts with new partners. Because of the high risk of failure for certain ITS projects, a special process is required to help **mitigate those risks** and to avoid the waste of taxpayer's funds that occurs when ITS projects fall short.

The process is summarized immediately below and described in full detail in the following sections. The process varies depending upon degree of **risk** involved. As shown in Figure 13-1, there are three steps in the project funding and delivery process shown in Figure 13-1.

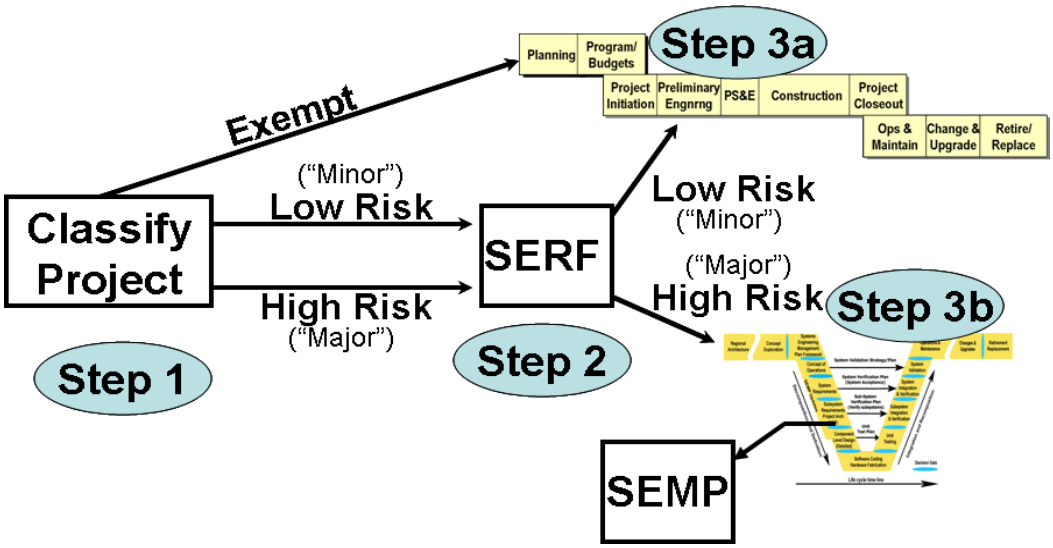

Figure 13-1: Steps to ITS Compliance

<u>**Step 1**</u> occurs when the ITS project is added to the Transportation Improvement Program (TIP). The lead agency makes a **preliminary** classification of the project as **High-Risk**, **Low-Risk**, or **Exempt**. If the project is **Exempt**, then the remainder of the process is exactly the same as for a traditional road building project. **Low-Risk** and **High-Risk** projects proceed to Step 2.

<u>**Step 2**</u> occurs when initial funding is requested. As part of the E-76 application package, the Project Manager must fill out a Systems Engineering Review Form (SERF), which consists of

seven questions. Based on the answers, the project is classified as **Low-Risk** or **High-Risk**, then proceeds accordingly.

Step 3a – For **Low-Risk** projects, the remainder of the process (after the E-76 is approved) is *exactly the same* as for a traditional road building project.

Step 3b – For **High-Risk** projects, the traditional road building process is **not** appropriate. Instead, the best approach is usually a Systems Engineering process. There are two funding cycles in this process – one at the beginning and the second after most of the design is complete (before implementation begins). A Systems Engineering Management Plan (SEMP) must be completed during the first funding cycle to help manage the implementation and testing.

13.1.2 How to Use these Guidelines

The ITS Program Guidelines are written for a diverse set of audiences, including: MPO/RTPA planners, local-agency project implementers, Caltrans Division of Local Assistance (DLA), and FHWA ITS staff. Some readers have ITS experience, others none.

For those with experience in using the previous version of these ITS Program Guidelines, **significant changes are included in this update.** Emphasis is now placed on **management of risk**. This has introduced new definitions of types of ITS projects and associated examples. The approach to compliance with 23 CFR 940 now takes a closer look at characteristics of risk in addressing the SERF requirements. With the experience from implementation of the ITS Program Guidelines in 2004, the resultant approach is more clearly defined and has resulted in the "Roadmap" in Figure 13-1. A new section on Americans with Disabilities Act (ADA) Requirements has also been added. By no means do we suggest that the reader skip any section of these guidelines, but the significant changes will be found in the sections on "Types of ITS Projects," "ITS Project Development and Funding," and "ADA Requirements."

Any new users of these ITS Program Guidelines should familiarize themselves with the entire chapter. Over time the users will likely return to specific sections. For example, to clarify which type category a project falls into, the user may want to revisit section 13.2 on "Types of ITS Projects." To initiate project funding, the user may revisit section 13.5 on "Funding Process Step-By-Step Procedures."

13.1.3 Purpose of these Guidelines

The ITS Program Guidelines describe best professional practices for planning and implementing ITS projects. They also establish the roles and responsibilities for all parties who are involved in the federal-aid ITS process, as well as define the process required for all ITS projects that will utilize federal funds (in any amount). 23 CFR 940 requires that all federal-aid projects:

- be consistent with **the Regional ITS Architecture**,
- use applicable **ITS Standards**,
- perform a **Systems Engineering Analysis** that is commensurate with the scope of the project.

Designing and developing ITS projects represent a paradigm shift in the engineering mindset, compared to traditional highway projects. For example, ITS projects may not have a clear break between the preliminary engineering phase and construction phase. Furthermore, some ITS projects may not include a construction phase and will not be suitable for "low-bid" construction contracts. The nature of the engineering development for ITS projects also implies a greater risk and uncertainties to successful completion.

Although not a requirement, FHWA strongly encourages the use of the FHWA/Caltrans "*Systems Engineering Guidebook for ITS"* (http://www.fhwa.dot.gov/cadiv/segb) as a reference for organizing the ITS project tasks, defining work products, and managing the development. The terminology used in these ITS Program Guidelines is defined fully at the Systems Engineering guidebook website.

13.1.4 TARGET AUDIENCES

The ITS Program Guidelines will be used by several audiences:

1.) **Planning agencies,** who will program the funds in the TIP and maintain the regional ITS architecture.
2.) **Local agencies,** who will carry out the projects. This includes their consultants, who may provide assistance with project management, and/or provide systems engineering technical assistance.
3.) **Caltrans DLA**, who will be the contracting agency for federal funding.
4.) **FHWA Division Office**, who will obligate federal funding and oversee some aspect of High-Risk projects.

Some of these participants may have little or no expertise in ITS, therefore, every effort is made to simplify the definitions and language in this guideline. A point to make is that no individual is expected to understand everything there is to know about systems, telecommunications, electronics, etc. in order to manage ITS projects.

As a relatively new field for most public-sector transportation managers, the knowledge required to successfully implement these projects varies widely. In particular, highly complex and risky projects require special knowledge and skills, which are often not available with local agencies. A certain amount of education and training will be necessary to comprehend and assure compliance with ITS regulations. Periodic training may also be necessary in order to keep up with technological changes in ITS.

For more information on ITS and Systems Engineering training opportunities, please see the USDOT ITS Professional Capacity Building Program website: http://www.pcb.its.dot.gov.

13.1.5 DEFINITION OF ITS

The definition of ITS has changed dramatically over the past decades, and it continues to evolve. Several decades ago, most people considered a computerized traffic signal to be "state-of-the-art" ITS. Today, every traffic signal is computerized and most people do not call them "ITS" – they are just "hardware" now. As state and local agencies have installed more and more electronic equipment over the past two decades, the emphasis of ITS has shifted from **internal** operational improvements to **external** coordination with other agencies, which enable each agency to achieve their mission more effectively. This **inter-agency cooperation** is the major objective of the Regional ITS Architecture (RA).

In 2001, 23 CFR 940 defined ITS as ***"…electronics, communications, or information technology, used singly or in combination, to improve the efficiency or safety of the 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 legal definition, most people say that **ITS must 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.

The inter-agency (or "institutional") challenge is to take advantage of the investment in infrastructure that has occurred over the years and use it to tackle **regional** mobility challenges. This means removing the institutional barriers that have existed in order to benefit a region as a whole. One example of institutional integration is sharing information between transit, arterial, and freeway agencies to improve flow for buses on the transportation network. Another type of integration is when agencies use technologies that are compatible with each other, such as traffic signals and emergency vehicle preemption to enable emergency vehicles to respond faster.

These ITS Program Guidelines reflect the latest ITS concepts by emphasizing "best professional practices" and requirements for ITS projects that are more complex and that include external cooperation. In contrast, procedural requirements for simple and Low-Risk projects have been simplified or eliminated.

To gain a basic understanding of ITS applications, please see the following USDOT website: http://www.itsoverview.its.dot.gov.

13.1.6 RISK MANAGEMENT

As said above, the application and oversight process for ITS projects is different in some significant ways from the traditional roadway construction process. This is because most ITS projects have **not** been successful. A successful ITS project is one which completes on schedule, within budget, and delivers all capabilities required. Studies of Information Technology (IT) application developments in the U.S. show 24% of projects are cancelled prior to completion. Further results indicate 44% were challenged (late, over budget, and/or with less than the required features and functions. This is especially true of ITS projects that involve something **new**, which the lead agency has not done before. This might include new technology or new software or new communications, or joint efforts with new partners. Because of the high risk of failure for certain ITS projects, special procedures are required to help **mitigate those risks** in order to avoid the waste of taxpayer's funds that occurs when ITS projects fall short.

Project risk may be defined in terms of schedule, cost, quality, and requirements. These risks can increase or decrease significantly based on several identified factors associated with ITS projects. The factors are:

1.) Number of jurisdictions and modes
2.) Extent of software creation
3.) Extent of proven hardware and communications technology used
4.) Number and complexity of new interfaces to other systems
5.) Level of detail in requirements and documentation
6.) Level of detail in operating procedures and documentation
7.) Service life of technology applied to equipment and software

The following Section 13.2 will address the level of each of these risk factors for types of ITS projects. For more information on Risk Management, the reader is encouraged to access the FHWA/Caltrans *Systems Engineering Guidebook for ITS* website at: http://www.fhwa.dot.gov/cadiv/segb/views/process/index.htm.

13.2 TYPES OF ITS PROJECTS

13.2.1 SUMMARY – TYPES OF PROJECTS

For purposes of these Guidelines, ITS projects are divided into three types: **Exempt, Low-Risk, and High-Risk projects**. The planning and development process to be followed is different for these three types. **The previous version of this Guideline referred to Low-Risk projects as "Minor" ITS projects, and High-Risk projects as "Major" ITS projects.** As a transition for the reader, both terms will be noted in these ITS Program Guidelines.

The following attributes can often be used to classify ITS projects as exempt, low, or high risk.

Exempt ITS projects do not require a Systems Engineering Analysis (SEA) and are not covered under these ITS Program Guidelines. All activities of the traditional roadway project development life-cycle process will be followed. No further ITS-specific action is necessary. They can be ***any*** the following:

1.) Upgrades to an existing traffic signal – This may include, for example, adding or revising left-turn phasing or other phasing, adding pedestrian-crossing displays.
2.) Installing an "isolated" traffic signal – This is a signal not connected to any type of external signal-control system, nor likely to be in the future because of its isolation.
3.) Traffic signal timing projects – This includes all "studies" whose purpose is to change the coordination parameters for controlling a group of signals – but with ***no*** installation of new hardware or software.
4.) Studies, Plans, Analyses – This includes ITS Master Plans, Deployment Plans, Technology Studies, etc. whose product is only a document, with no new hardware of software installed.
5.) Routine Operations – This includes operating and maintaining any ITS elements or systems – again with no new hardware or software installed.

Low-Risk (formerly "Minor") ITS projects are often referred to as ITS infrastructure expansion. Standard Plans, Standard Specification, and Standard Special Provisions are well documented. They will have ***all*** of 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

High-Risk (formerly "Major") ITS projects are often referred to as ITS "System Developments." They have ***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 not detailed or not fully documented
6.) Operating procedures not detailed or not fully documented
7.) Technology service life shortens project life-cycle

These risk factors are discussed in more detail in Table 13-1.

Table 13-1 – Risk Assessment for ITS Projects

	Low-Risk Project Attributes	High-Risk Project Attributes	Risk Factors
1	Single jurisdiction and single transportation mode (highway, transit or rail)	Multi-Jurisdictional or Multi-modal	With multiple agencies, departments, and disciplines, disagreements can arise about roles, responsibilities, cost sharing, data sharing, schedules, changing priorities, etc. Detailed written agreements are crucial!
2	No software creation; uses commercial-off-the-shelf (COTS) or proven software	Custom software development is required	Custom software requires additional development, testing, training, documentation, maintenance, and product update procedures -- all unique to one installation. This is very expensive, so hidden short-cuts are often taken to keep costs low. Additionally, integration with existing software can be challenging, especially because documentation is often not complete and out-of-date.
3	Proven COTS hardware and communications technology	Hardware or communications technology are "cutting edge" or not in common use.	New technologies are not "proven" until they have been installed and operated in a substantial number of different environments. New environments often uncover unforeseen problems. New technologies or new businesses can sometimes fail completely. Multiple proven technologies combined in the same project would be high risk if there are new interfaces between them.
4	No new interfaces	New interfaces to other systems are required.	New interfaces require that documentation for the "other" system be **complete and up-to-date.** If not (and often they are not), building a new interface can become difficult or impossible. Duplication of existing interfaces reduces the risk. "Open Standard" interfaces are usually well-documented and low risk.
5	System requirements fully-detailed in writing	System Requirements not detailed or not fully documented	System Requirements are critical for an RFP. They must describe in detail all of the functions the system must perform, performance expected, plus the operating environment. Good requirements can be a dozen or more pages for a small system, and hundreds of pages for a large system. When existing systems are upgraded with new capabilities, requirements must be revised and rewritten.
6	Operating procedures fully-detailed in writing	Operating procedures not detailed or not fully documented	Standard Operating Procedures are required for training, operations, and maintenance. For existing systems, they are often out-of-date.
7	None of the technologies used are near end of service life	Some technologies included are near end of service life	Computer technology changes rapidly (e.g. PC's and cell phones become obsolete in 2-4 years). Local area networks using internet standards have had a long life, but in contrast some mobile phones that use proprietary communications became obsolete quickly. Similarly, the useful life of ITS technology (hardware, software, and communications) is short. Whether your project is a new system or expanding an existing one, look carefully at **all** the technology elements to assess remaining cost-effective service life.

13.2.2 Examples of ITS Project Types

An example of an **Exempt** ITS project would be the installation of traffic signal hardware (traffic controller/software, cabinet, detectors, etc) to control an isolated intersection in City A. It meets the signal warrants found in Chapter 4 of the California MUTCD, but there is no current or foreseen need to interconnect to other signals. No software development is needed; merely adjusting programmable settings and parameters for control. Standard plans, specifications, identified special provisions have been well documented over the years for the design and construction of signal control field equipment. The traditional roadway project development process will be used. Typical of this kind of project is for plans, specifications, and estimate (PS&E) to be developed, and construction contracts handled through a low-bid selection.

An example of a **Low-Risk** ITS project is the addition of 30 full matrix changeable message signs to an existing system that has five identical signs already deployed. No changes are needed to the existing central or field equipment. The system was initially designed to accommodate these additional signs so no additional software is needed. Assumptions are: 1) the initial system has been completed and the system is working well, 2) the contractor will deploy the signs, poles and foundations, controllers, and wire the controllers into the signs, and 3) the agency will add configuration information about the signs at the central computer. Updates to the existing plans have been reviewed to ensure that the original design and implementation is not adversely affected as a result of adding the elements.

During the design process, it may be discovered that a number of changes to the existing system are needed in addition to adding the expansion elements. This need could arise because of new and better technologies (or the old hardware is no longer available), or because of the desire to improve or expand the functionality of the "previous" system, or because of the need to use the system in a different way (e.g. sharing control with another party). **Any of these instances would elevate the project to a High-Risk implementation.**

Additional examples of **Low-Risk** ITS projects include:

- Adding five identical CCTV cameras to the existing 20 – with no other changes to the system or how it's used.
- Adding 50 identical new loops to the existing 200 – no other changes
- Installing an existing parking management system at 2 additional garages – with no changes
- Expanding the pre-existing system/network by adding several more XXXX units – with no changes. (XXXX can be almost any ITS element)
- Expanding existing communications systems – this consists of extending existing fiber-optic or wireless communications systems, using the same technology and specifications as the pre-existing system.
- Leasing turnkey services only (e.g., website-based information service) – with no hardware or software purchases.

High-Risk ITS projects are often referred to as ITS System developments. For example, a High-Risk ITS project will result from adding the following new requirement to the previously described Low-Risk project: "The changeable message signs will have shared control with a partner Agency B." For this example, Agency B manages events at two activity centers. As part of the installation, Agency A will be installing six signs that would assist agency B for their event management. Agency B would use the CMS to divert traffic to get the attendees in and out of the event faster and more safely. To enable this shared control, new software may need to be developed and integrated into the existing system. With this requirement for new functionality (shared control), new risks and complexity are introduced. Although the traditional roadway

Design/development and construction process is needed for the signs and controllers at each location, there will be a need for systems engineering to address the software development and integration efforts. In this example, revisions to the existing "concept of operations" and development of agreements for interagency coordination will be especially important to clarify expectations and avoid future disputes.

Additional examples of **High-Risk** ITS projects include:

- Multi-jurisdictional or multi-modal system implementation -- Because of the external interfaces required, these projects generally include substantial software development. For example:
  - A traveler information system that collects data from multiple agencies or modes
  - A Bus Traffic Signal Priority system between City Traffic and Regional Transit, or one that crosses multiple jurisdictions.
- The first stage of an "umbrella" system implementation. During this first stage, the full system engineering process would be used to develop the overall system framework plus the first implementation of that framework. For example:
  - New Traffic Signal Coordination system design plus implementation at an initial number of signals, with more signals added in later project(s).
  - New Traffic Information System design plus the first implementation in Cities X and Y, with more cities added in later project(s).
  - New Electronic Fare-Payment System design and initial implementation on Metro buses, with other transit agencies added in later project(s).

  If subsequent stages replicate the initial implementation, they would not be high risk. Instead, they fit the definition of a low risk ITS project, expanding the existing system with no new capabilities, and no new interfaces.

13.3 ITS PROJECT DEVELOPMENT AND FUNDING

The three types of ITS projects (Exempt, Low-Risk, and High-Risk) are linked to specific process by way of their risk characteristics. The traditional road building process as shown in Figure 13-2 has been used for many years. Design and installation is well documented. Over the years, requirements have become well defined, product performance is solid, and the technology is proven. As with roadway elements (pavement, drainage), ITS field elements (signals, CMS, CCTV, RWIS) are designed and constructed with Standard Plans, Standard Specifications, and Standard Special Provisions that are well documented. Risk of failure is low for these ITS projects, except when changing to new technology.

For **Exempt and Low-Risk** (formerly "Minor") ITS projects, the traditional single-phase PE obligation and authorization process will be followed. Work will include all activities of the traditional roadway project development life-cycle process leading up to construction. Funding steps for Low-Risk ITS Projects can be seen in Figure 13-2.

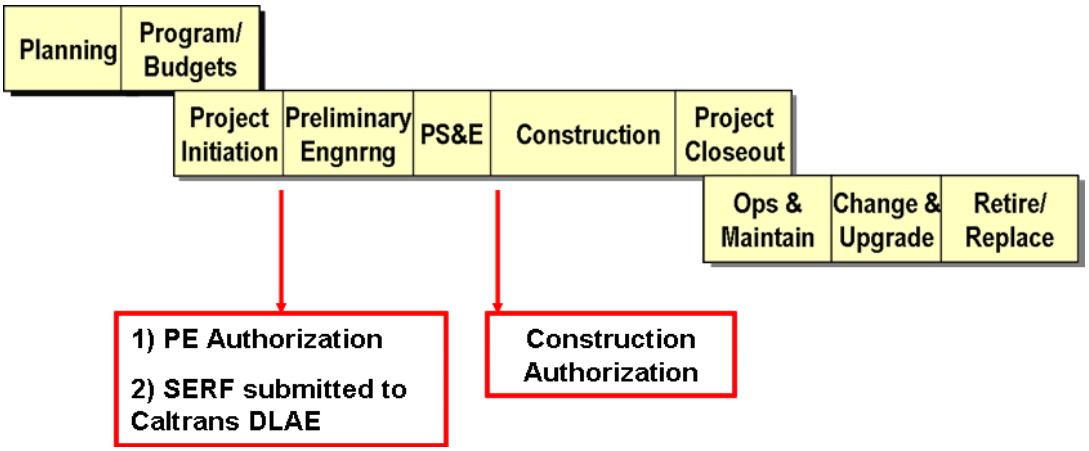

Figure 13-2: Process and Funding Steps for Low-Risk ITS Projects

More complex ITS projects lead to higher risk of failure (termination, time delays or cost increases). Additional elements are needed in the process of development to mitigate the higher risks. These additional elements can be thought of as extensions to the traditional road building process. The systems engineering approach is graphically depicted in Figure 13-3. To learn more about the Systems Engineering process, see the USDOT ITS Professional Capacity Building Program website: http://www.pcb.its.dot.gov, and FHWA/Caltrans *"Systems Engineering Guidebook for ITS"* at: http://www.fhwa.dot.gov/cadiv/segb/views/process/index.htm.

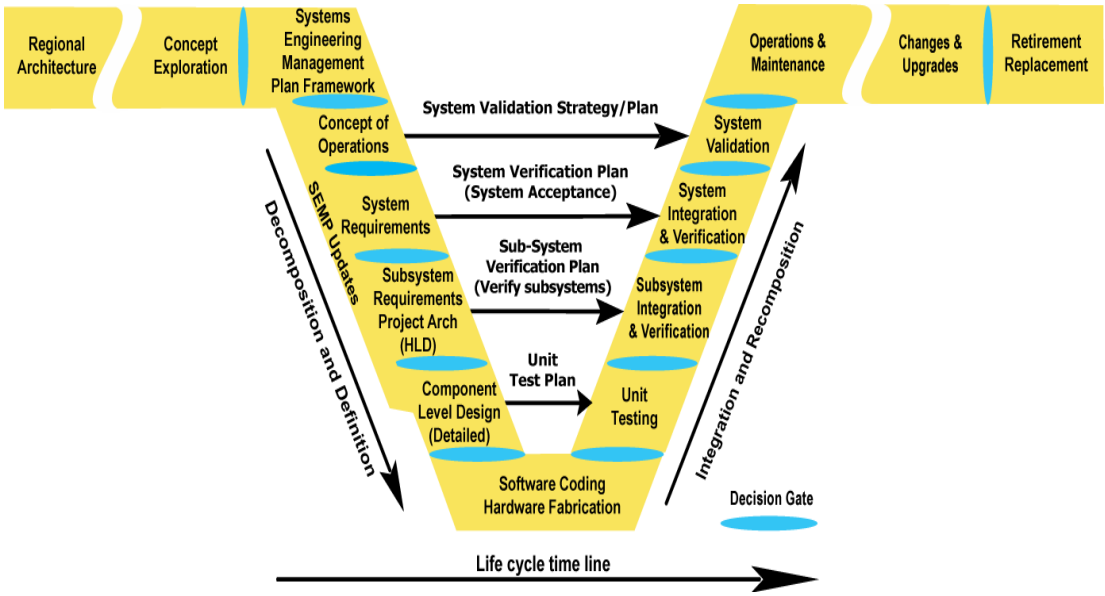

Figure 13-3: Systems Engineering Vee Life Cycle Process

For **High-Risk** (formerly "Major") ITS projects, a 2-phase PE obligation and authorization process will be followed. Figure 13-4 pinpoints when each Phase begins. A separate construction obligation and authorization will be needed for traditional roadway (infrastructure) improvements that accompany system development. Figure 13-4 does not infer that work provided by the PE contractor ends with Construction authorization. As shown in Fig 13-6 in Section 13.9, the same PE contractor will often be involved in system engineering activities on the right side of the Vee Life Cycle Process in support of verification and validation.

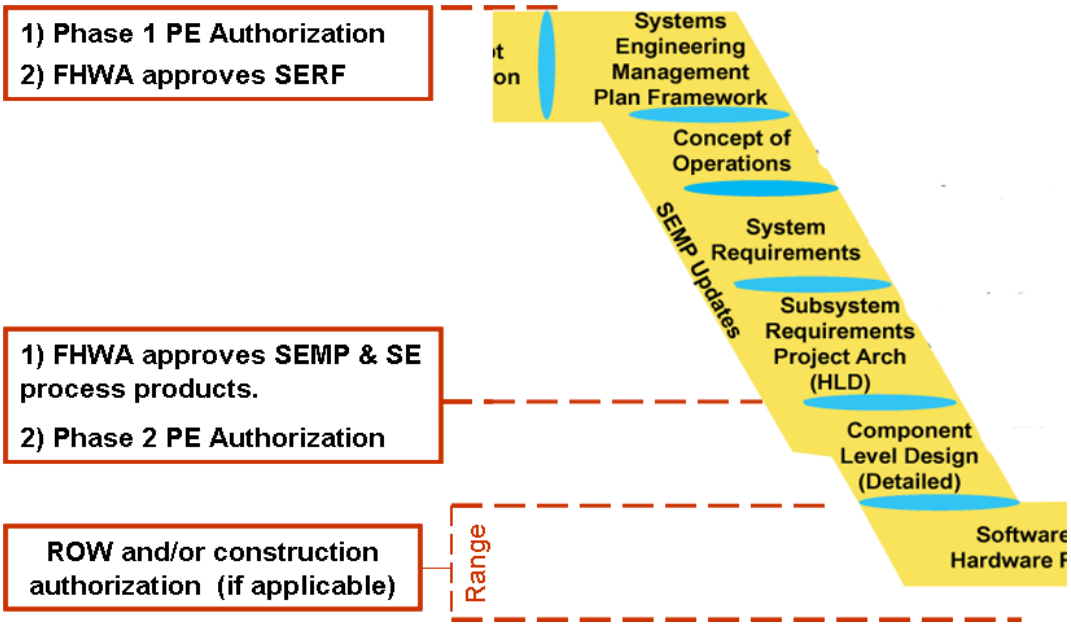

Figure 13-4: Funding Steps for Systems Engineering Process

Early determination of risk leads to early determination of type of ITS project, which leads to an early determination of budgeting approach. The systems engineering Vee process concentrates more time and cost on the up-front engineering activities relative to the traditional road building process that typically concentrates funding and scheduling priorities to the construction (back-end) phase.

For more information on Systems Engineering, the reader is encouraged to access the FHWA/Caltrans *Systems Engineering Guidebook for ITS* website at: http://www.fhwa.dot.gov/cadiv/segb/views/process/index.htm.

13.4 General ITS Responsibilities

This section describes ITS responsibilities, during planning and implementation of the project, from the perspective of four different roles:

1.) Regional/Metropolitan Transportation Planning Agency (RTPA/MPO)
2.) Local agency (including their consultants in a project management role)
3.) Caltrans Division of Local Assistance
4.) FHWA Project Engineer
5.) Communities

The user ***should*** read the section that corresponds to their role. The other sections are optional. For each role, the responsibilities are described for each of the three steps in the Roadmap below in Figure 13-5, which can be briefly described as Planning, Funding, and Implementation.

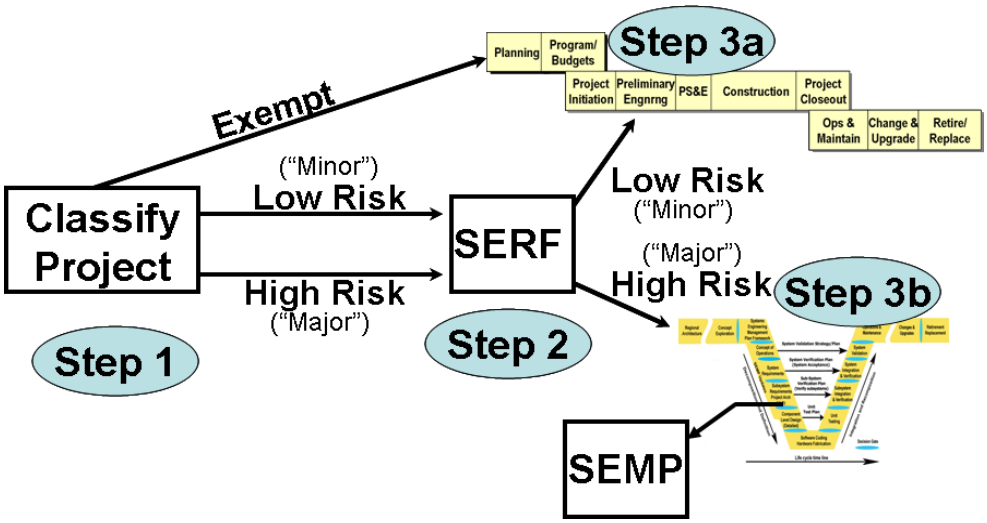

Figure 13-5: Steps to ITS Compliance

13.4.1 Regional/Metropolitan Transportation Planning Agency

Step 1 Roadmap Step 1

All ITS projects must be listed on the FTIP prior to obligation of funds. However, many ITS projects are not required to be listed individually, since they are classed as air quality exempt. Such projects may be lumped together in the FTIP. If a traditional roadway design project contains an ITS element, then the requirement for FTIP listing is determined by the overall project.

Because of this variation in project classification, projects with ITS elements may not be identified. For this reason, the MPO or RTPA is encouraged to coordinate with the local agencies (project sponsors) to "flag" ITS projects, or at least note the High-Risk (formerly "Major") ITS projects, within their FTIP submittal to Caltrans/FHWA. This may be a symbol designation within the current FTIP format, a separate page listing, or some other reporting means.

By delineating operational improvements from the rest of the capital program, this gives FHWA ITS Engineers opportunity to make pre-authorization outreach visits to project sponsors to assess degree of education, technical assistance, and oversight that will be needed before the project reaches its funding year. This can reduce risk of project failure.

Step 2 Roadmap Step 2

The regional planning agency (RTPA or MPO), as owner/maintainer of the regional ITS architecture, will assist the ITS project sponsor (local agency) to address the architecture aspects of the Systems Engineering Review Form (SERF).

For more information on regional ITS architectures, the reader is encouraged to access USDOT ITS Architecture website at: http://www.its.dot.gov/arch/index.htm.

Step 3 Roadmap Step 3

As each ITS project is implemented, the regional ITS architecture will need to be updated to account for any expansion in ITS scope, and to allow for the evolution and incorporation of new ideas. When actually defined or implemented, a project may add, subtract or modify elements, interfaces, or information flows from the regional ITS architecture. Because the regional ITS architecture is meant to describe the current (as well as future) regional implementation of ITS, it must be updated to correctly reflect how the developed projects integrate into the region.

Updates will be submitted by the local agency project manager. This can occur at two points in time during project development process. The first time is upon documentation of the project architecture at completion of the High-Level (functional) Design. Additionally, during implementation, project architectures may change. If so, the project manager will submit those changes at project completion.

A regional ITS architecture maintenance process is documented in the region, and used to make any changes.

13.4.2 Local agency (include consultants in project management role)

Step 1 Roadmap Step 1

The local agency is responsible for submitting their projects to the MPO/RTPA for inclusion in the State Transportation Improvement Program for Federal approval (FTIP). For projects that include ITS elements, the local agency makes a **preliminary** classification of the project's risk as exempt, low, or high. It may take a number of months for the project to be added to the FTIP, so Step 1 should be performed well ahead of the expected project start date.

If the project is considered **Exempt**, then all activities of the traditional roadway project development life-cycle process will be followed. Exempt projects are not considered "ITS" for purposes of these procedures and no further ITS-specific action is necessary.

Step 2 Roadmap Step 2

To initiate federal funding of the ITS project, the local agency verifies that the project is listed in the FSTIP and submits to Caltrans District Local Assistance Engineer (DLAE) the "Request For Authorization To Proceed With Preliminary Engineering" (LAPM Exhibit 3-A and associated data sheets (LAPM Exhibit 3-E). This is often referred to as the "E-76 Package" and the process of submitting and approving it is often referred to as the "E-76 Process."

This PE request will often include the completed Field Review Form (*LAPM* Exhibit 7-B) and associated Data Sheets (*LAPM* Exhibit 3-C to 3-I). This Field Review Form will include ITS administrative and financial elements to be addressed when applicable. To accommodate agencies with limited staffing, the Field Review Form may be submitted separate from the request for authorization to proceed, but within four (4) months after the Federal PE authorization date. See Chapters 3, "Project Authorization" and Chapter 7, "Field Review," of the *LAPM* for more information.

The completed Field Review Form includes an ITS Systems Engineering Review Form (SERF) that is required for all ITS projects. The SERF (LAPM Exhibit 7-I) provides responses to the seven requirements for systems engineering analysis within 23 CFR 940 Part 11. The SERF will assist the local agency in determining if the project is Low-Risk or High-Risk. If the local agency does not have enough information to answer all seven questions, the project is probably high risk.

This determination of risk is delegated to the local agency (project sponsor). Completion of the SERF is an opportunity to verify (or perhaps change) the preliminary determination of risk made during project programming in the Roadmap Step 1.

If the ITS project is **Low-Risk** (formerly "Minor"), the response to the SERF will be complete and will document conformance to 23 CFR 940. If DLAE agrees that the project is Low-Risk, then the traditional single-phase PE obligation and authorization process is used.

IF the ITS project is **High-Risk** (formerly "Major"), response to some of the seven questions in the SERF can not be decided at this early stage. Responses in the SERF will identify the points when each question will be answered during the systems engineering process. The first phase of PE (PE1) is authorized after submittal of the initial request for authorization by the local agency.

Step 3 **Roadmap Step 3**

Step 3a For **Low-Risk** ITS projects, the agency's project development process used for regular roadway projects will be followed. These activities are denoted as Step 3a in the "Roadmap to ITS Compliance". For purposes of these procedures, no further ITS-specific action is necessary. Refer to *Section 13.9 Procurement/Construction* for more information on procurement options.

Step 3b For **High-Risk** ITS projects, conformance to 23 CFR 940 will be completed in Step 3b of the "Roadmap of ITS Compliance" during which the systems engineering tasks on the left side of the Vee process are undertaken (i.e., Concept of Operations thru High-Level Design).

If the project architecture - defined as part of the High-Level (functional) Design - adds, subtracts or modifies elements, interfaces, or information flows from the regional ITS architecture, these changes need to be submitted to the RTPA/MPO who maintains the regional ITS architecture. This can be done upon completion of the SEMP. In addition, if similar changes occur during implementation, the project manager should submit those changes at project completion.

Prior to the Component-Level Design task within the SE Vee process, the local agency submits to DLAE the Systems Engineering Management Plan (SEMP) and Systems Engineering process products. Upon receiving final SEMP approval, the local agency may proceed with a request for Phase 2 PE (PE2) authorization. Upon approval, the local agency proceeds with project implementation.

13.4.3 Caltrans Division of Local Assistance

13.4.3.1 District Local Assistance Engineer (DLAE) –

Step 1 **Roadmap Step 1**

The DLAE has no responsibilities during Step 1.

Step 2 **Roadmap Step 2**

The DLAE reviews the request from the local agency for PE authorization to assure satisfactory completion. For those local agencies that require additional time to process the Field Review Form, the DLAE will prepare and submit the E-76 for PE to Headquarters DLA Implementation.

Upon receipt of the Field Review Form, including the SERF, the DLAE verifies that the risk determination made by the local agency is correct. If the DLAE agrees that the project is **Low-Risk** (formerly "Minor"), the traditional single-phase PE obligation and authorization process will be used and no further ITS-specific action is necessary.

If the project is determined to be **High-Risk** (formerly "Major"), the DLAE forwards the SERF to DLA Implementation and FHWA concurrently for review and approval. The DLAE verifies from the E-76 system that FHWA has obligated the funds before issuing authorization to proceed with Phase 1 PE (PE1).

In the instance where the Field Review Form follows Federal PE authorization, further verification of the earlier determination of risk is performed. Where the information leads to a change in project type (Low to High or vice-versa), a corrected E-76 is submitted to DLA Implementation. In the instance of a Low- to High-Risk change, the corrected E-76 will either de-obligate the PE dollar amount for system design and implementation or will include a conditional statement that limits Notice-to-Proceed to only PE1 activities.

Step 3 **Roadmap Step 3**

Step 3a For **Low-Risk** ITS projects, the project development process used for regular roadway projects will be followed by DLAE, noted as Step 3a in the "Roadmap to ITS Compliance." Refer to *Section 13.9 Procurement/Construction* for more information on procurement options.

Step 3b For **High-Risk** ITS projects, the systems engineering tasks on the left side of the Vee process are undertaken (i.e., Concept of Operations thru High-Level Design). The Systems Engineering Management Plan (SEMP) is sent to DLA Implementation and FHWA concurrently for review and approval. The DLAE verifies from the E-76 system that FHWA has obligated the funds before issuing authorization to proceed with Phase 2 PE (PE2) for system design and implementation.

13.4.3.2 Headquarters DLA Implementation –

Step 1 HQ DLA Implementation has no responsibilities during Step 1.

Step 2 For High-Risk ITS projects, DLA Implementation forwards the SERF to the FHWA ITS Engineer for review and approval. Upon notification of FHWA approval, DLA Implementation notifies DLAE, and PE1 may be authorized.

Step 3b DLA Implementation forwards the SEMP to FHWA for review and approval. Upon notification of FHWA approval, DLA Implementation notifies DLAE, and PE2 may be authorized.

13.4.4 FHWA ITS Engineer

Step 1 **Roadmap Step 1**
The FHWA Project Engineer has no responsibilities during Step 1.

Step 2 **Roadmap Step 2**
If the project is a **High-Risk** (formerly "Major") ITS project, the SERF is submitted to FHWA for review and determination of level of federal oversight of the systems engineering process.

The following information defines the FHWA oversight of the Systems Engineering (SE) process for **High-Risk** ITS projects. Please note that **this oversight is limited to the ITS portions of the project only**. General oversight for all other aspects of the federal aid process will continue to be handled through the *Caltrans/FHWA Joint Stewardship & Oversight Agreement.*

The FHWA oversight process is built upon the common SE practice of using "control gates" as a project-management tool. It assumes that implementation of the ITS project (or the ITS elements within a larger construction project) will follow a pre-determined sequence of steps, with each step (or "milestone") being judged by the project manager to be satisfactorily completed before substantive work begins on the next step.

FHWA will exercise its oversight responsibilities primarily via review of deliverable(s) produced at each of the milestones in the SE process (e.g. Concept of Operations, Acceptance Tests, etc.). They will do this in a manner that avoids unnecessary delays to the project. The action at each step will take ONE of the following forms: a.) Review and approval, b.) Review and comment, or c.) Information only. These terms are explained below.

- Review and Approval - FHWA shall receive the final version of the milestone document for review and approval. They will respond within one week -- whenever given at least two weeks advanced notice of the document's arrival. Otherwise, turnaround time will be two to three weeks. If they do not respond within the applicable time period the document is automatically deemed approved.

- Review and Comment - FHWA shall participate in the normal review process that the agency uses at the "final draft" stage of developing the milestone document. They will abide by the same schedule that is given to all other reviewers. If they do not provide comments within the given schedule, project work may proceed without them. Their comments will be treated as suggestions that will be given the same consideration as comments from other reviewers.

- Information Only - Upon completion of the milestone, the project manager shall email the associated document to FHWA. No "approval" by FHWA will be needed. Upon emailing the document, the project may begin the next task immediately (but not before).

This determination of level of oversight, along with SERF approval, will be transmitted to DLA Implementation and DLAE concurrently.

Step 3b Roadmap Step 3b

Regardless of the level of oversight determined for each SE process milestone deliverable, the completed Systems Engineering Management Plan (SEMP) must always be submitted to FHWA for review and approval at completion of the system definition tasks (generally after the “High-Level Design” task). This approval will allow Caltrans Local Assistance to authorize preliminary engineering (PE2) funding for system design and implementation. Specific SEMP development and documentation guidance can be found at the "*Systems Engineering Guidebook for ITS"* website (www.fhwa.dot.gov/cadiv/segb/).

The FHWA review process can be expedited by documents being sent via email to FHWA simultaneously with distribution to Caltrans and/or other stakeholders involved in the project development. Paper copies are **not** required, unless the materials cannot be sent electronically.

13.5 FUNDING PROCESS STEP-BY-STEP PROCEDURES

This section presents an **integrated view** of the funding process, combining all four of the perspectives described separately above. Thus, it presents a more comprehensive picture of all activities and responsibilities during each step of the funding process. As before, the steps are discussed chronologically. The chronological steps for **High-Risk** projects are discussed first, followed by the procedures for **Low-Risk** and then **Exempt** ITS projects.

13.5.1 High-Risk (formerly "Major") ITS Projects

High-Risk federal-aid ITS projects shall follow the regular federal-aid procedures outlined in the LAPM, except for the addition of a 2-phased PE obligation and authorization procedure to assure conformity with the federal regulation 23-CFR-940. Application and control of the Systems Engineering process is a key reason for the 2-phased PE process as specified below.

Step 1 Roadmap Step 1 -
Transportation Planning:

1. The local agency submits project to the regional planning agency for inclusion in the Federal Approved State Transportation Improvement Program (FSTIP). The local agency makes a ***preliminary*** designation of risk for the project.

2. The MPO or RTPA is encouraged to coordinate with the local agencies (project sponsors) to "flag" ITS projects, or at least note the High-Risk ITS projects, within their FTIP submittal to Caltrans. This may be a symbol designation within the current FTIP format, a separate page listing, or some other reporting means.

3. The regional planning organization reviews the project for consistency with the Caltrans transportation planning process before submitting the FTIP to Caltrans HQ.

4. Caltrans HQ incorporates the FTIP in the FSTIP, and submits the FSTIP to the FHWA Division for review and approval.

5. The FHWA Division reviews and approves the FSTIP.

Step 2 Roadmap Step 2 -
Project Development (PE1):

6. The local agency verifies that the project is listed in the FSTIP, and then submits a Phase 1 PE request package to the DLAE.

7. When the PE package is satisfactory, the DLAE forwards the package, and submits E-76 for Phase 1 PE to DLA Implementation.

8. When the PE package is satisfactory, DLA Implementation executes the E-76, and submits it to the FHWA for obligation, with a copy to the DLA ITS Coordinator.

9. The DLAE verifies from the E-76 system that FHWA has obligated the funds before issuing authorization to proceed with Phase 1 PE.

10. If not submitted with the PE (PE1) request package, soon after Phase 1 PE begins the local agency submits the completed Field Review form with SERF (Exhibit 7-I System Engineering Report Form) to the DLAE.

    In the SERF, the local agency must provide as much information as possible for each of the following ITS requirements. If any of these items are not known at this time, the Local Agency must include a commitment to address them in detail during system design.

    a) Identification of portions of the RA being implemented
    b) Identification of stakeholders, communities and participating agencies roles and responsibilities
    c) Requirements definitions
    d) Analysis of alternative system configurations and technology options to meet requirements
    e) Procurement options
    f) Identification of applicable ITS standards and testing procedures
    g) Procedures and resources necessary for operations and management of the system

11. The DLAE forwards the field review package including SERF to DLA Implementation with a copy to the DLA ITS Coordinator.

12. The DLA Implementation forwards the package to FHWA.

13. FHWA reviews the SERF for FHWA oversight determination, comments on the SERF, and sends the information back to the DLA Implementation.

FHWA oversight can consist of approval of the Systems Engineering Management Plan (SEMP); products from each step of the Systems Engineering process, or portions thereof, or merely participate in scheduled process technical review points. FHWA is also available to provide the local agencies with additional ITS technical assistance and guidance as needed.

14. The DLA Implementation relays the information to the DLAE, who relays it to the local agency.

15. Upon receipt of the Field Review package, the DLA Implementation prepares a Program Supplement, with ITS covenants added. After approval by Caltrans Local Program Accounting, the Program Supplement is transmitted directly to the local agency for signature.

16. The local agency signs the Program Supplement and returns it to DLA Implementation.

17. Prior to component detailed design, the local agency submits the completed SEMP as well as the Systems Engineering process products(s) mentioned in Step #12 above, through the DLAE and DLA Implementation (with a copy to DLA ITS Coordinator) for FHWA's review and approval.

18. FHWA notifies the DLA Implementation that they approved the SEMP and specified process product(s).

19. The DLA Implementation relays the approval to the local agency through the DLAE with a copy to the DLA ITS Coordinator.

20. Upon receiving final SEMP and process product(s) approval, the local agency may proceed with a request for Phase 2 PE (component detailed design).

21. The DLAE checks for environmental clearance before preparing and submitting an E-76 for Phase 2 PE to the DLA Implementation with a copy to the DLA ITS Coordinator.

Step 3b Roadmap Step 3b –
Project Development (PE2):

22. The DLA Implementation reviews for completeness and accuracy before transmitting the E-76 to FHWA.

23. The DLAE verifies FHWA obligation of funds on the E-76 before issuing the Authorization to Proceed with Phase 2 PE.

24. The local agency proceeds with component detailed design.

Construction:

25. If the ITS project includes activities defined as construction; the local agency must submit a PS&E package requesting construction authorization. The request includes the necessary federal-aid paperwork and clearances.

26. Beyond this point, normal federal-aid procedures apply for completing the project. Use Form 17-C "Final Inspection Form" of the LAPM to finalize the project.

13.5.2 Low-Risk (formerly "Minor") ITS Projects

Processing Low-Risk ITS projects will follow the traditional one-phase federal-aid PE procedures (see Exhibit 13-B for detail). For those not familiar with the one-phase federal-aid PE procedures, it generally consists of steps 1-11, 15, 16, 24-26. The SERF (Exhibit 7-I, System Engineering Report Form) must be filled out as part of the field review package. However, SERF review and approval by FHWA are **not** required.

The DLAE forwards the field review package including the SERF to DLA Implementation with a copy to the DLA ITS Coordinator.

13.5.3 Exempt Projects

Processing Exempt ITS projects will follow the traditional one-phase federal-aid PE procedures. The **SERF will not be required** as part of the field review package.

13.6 ENVIRONMENT

The environmental process and environmental clearances for ITS projects are processed under normal federal-aid regulations and procedures. For environmental guidance, see Chapter 6 "Environmental Procedures" of the LAPM. With few exceptions, most ITS projects can be classified as either Programmatic Categorical Exclusion (PCE) or Categorical Exclusion (CE). PCE and CE approvals are performed by Caltrans.

Generally, ITS projects involve little to no disturbance of the ground. The ground disturbance that normally occurs on ITS projects is related to digging foundations for utility, signal, camera, or message sign poles and excavation of trenches for communications cabling. Occasionally ITS

projects involve the construction of transportation management center buildings or information kiosks. Such projects are not likely to cause any negative environmental impacts, except in rare cases where they might encounter an archaeological site, a historic site or an endangered species habitat.

13.7 AMERICANS WITH DISABILITIES ACT (ADA) REQUIREMENTS

ADA standards which deal with the public right of way (such as curb ramps, sidewalks, etc.) apply to ITS projects. Common elements in ITS projects in California are computer hardware/software, Changeable Message Signs (CMS) and Closed-Circuit Television (CCTV), Communications, and public websites. These elements are discussed individually below.

1.) Computer Hardware and Software
Computer hardware and software that is used **internally** by public agencies are generally not subject to ADA requirements. This includes computer equipment at traffic/transit management centers, or other locations. However, one key exception is websites or kiosks that are accessible to the general public (see item 4 below).

2.) Changeable Message Sign and Closed-Circuit Television
ITS projects sometimes include one or several Changeable Message Signs (CMS) or Closed-Circuit Television cameras (CCTV). These are often mounted on poles near a roadway. One key question for analyzing this element for ADA requirements is, “Does the installation or operation of a CMS or CCTV unit disturb any pedestrian facilities or travel routes”? The term "disturb" includes partial or complete removal as well as damage to the pedestrian facility or travel route that was caused by tunneling underneath. If a pedestrian facility or travel route is disturbed in any of these ways, then that portion disturbed **must be re-built in compliance with ADA standards**. If the installation of CMS or CCTV units do not disturb pedestrian facilities or travel routes, then they do not have to be rebuilt. Note that CMS and CCTV units generally require communications (see below).

3.) Communications
Communications systems are sometimes installed as part of ITS Integration projects. For both Wireline and Wireless communications, a key question in determining ADA requirements is, “Does the installation or operation of this ITS communication system disturb any pedestrian walkways”?

These systems can take several forms:

a) "Wireline" (e.g. fiber-optic, coax, other types of cables) - If these are installed above ground using existing facilities (e.g. telephone or cable-TV poles) or underground in existing conduit, and if no pedestrian walkways are disturbed during the installation process, then the ADA standards do not require any changes to nearby walkways. If installation requires digging trenches in the ground and those trenches disturb a pedestrian facility or travel route, then that facility or travel route must be rebuilt to ADA standards. If the trench is within the roadway itself, all legal crossings and crosswalks are considered pedestrian facilities or travel routes and the portion of the roadway that is disturbed must be rebuilt to ADA standards.

b) "Wireless" communications require antennas, which can be mounted on poles, buildings, roadside signs, or other structures. If these structures already exist and ***no*** pedestrian

walkways are disturbed during installation or operation of these communications systems, then ADA does not require any changes to nearby walkways.

4.) Public Websites or Kiosks
ITS Integration Projects sometimes include a website, which may be accessible to the public or restricted to designated parties. If the website (or kiosk) will be available to the public (e.g. for distributing traveler information), then it must meet the requirements of Section 508 of the Rehabilitation Act of 1973 (as amended in 1998). This means that the website must include features that enable the use of "assistive technology", by people with certain types of disabilities. Section 508 is a requirement for recipients of federal funds and for federal agencies. If the kiosk or website is not intended for public use, then both the recipient and the federal agency must ensure that accessibility for the information on the technological device is available for any employees.

For more information on ADA Requirements, please see the following websites: www.ADA.gov and www.section508.gov.

13.8 RIGHT OF WAY

Generally, new right of way is rarely needed for ITS projects. Easements may be needed for communications cabling. Occasionally, an ITS project may involve utility relocations or the purchase of right of way for construction of a traffic management center building or information kiosk. For guidance on right of way procedures, see Chapter 13, “Right of Way” of the LAPM.

13.9 PROCUREMENT / CONSTRUCTION

The federal-aid procurement regulations as set forth in 23 CFR 172, 635, 655, and 49 CFR 18, define the requirements that state and local agencies must adhere to when procuring projects with federal-aid highway funds. These procurement regulations identify possible contracting options available for designing and constructing projects including such contracts as “engineering and design related services,” “construction,” and “non-engineering/non-architectural.” The regulations also require use of competitive contract award procedures for any project financed by federal highway funds.

The regulations require state and local agencies to award:

- Construction contracts on the basis of competitive bidding,
- Engineering and Design services contracts on the basis of qualifications-based selection,
- Non-engineering/non-architectural contracts use state approved procurement procedures in accordance with 49 CFR 18.

The procurement approach required for construction projects (as defined by 23 USC 101 and the related FHWA regulations) does **NOT** always apply to ITS projects. Many standalone ITS projects do not meet the FHWA definition of construction.

- **ITS Construction** – If field devices and/or communications infrastructure are being physically installed in the roadway, then that work and required equipment usually meets the definition of construction. Examples are the purchase and installation of new traffic signals, new controller cabinets, vehicle detectors, and conduit for cabling.

- **ITS Engineering & Design** – The purchase and installation of **electronic** equipment (as long as it does not involve "construction" as defined above), **can** be performed as part of P.E. This includes the computers and electronic equipment at a central site, and also the electronic components within the field equipment. Examples are the controller inside a signal cabinet, or the electronic tolling pricing display panels and associated electronics inserted into panel cutouts of changeable message signs already in place.

An agency also has the option of procuring electronic equipment as part of a construction contract (e.g. a complete changeable message sign including electronics). This might be useful when the project is primarily construction, and the electronic equipment is a minor element. However, development of new software should never be included in a "construction" contract.

The Engineering and Design Services contracting mechanism has been successfully used to retain System Engineers and System Integrators that can provide the entire spectrum of services required to implement an ITS project, such as a traffic management center. This might include the specification, procurement, configuration and installation of all hardware and software to provide the functionality required. For these types of services, the consultant selection procedures (qualifications-based) in Chapter 10 of the LAPM must be followed. Figure 13-6 depicts typical contracting arrangements for most High-Risk ITS projects.

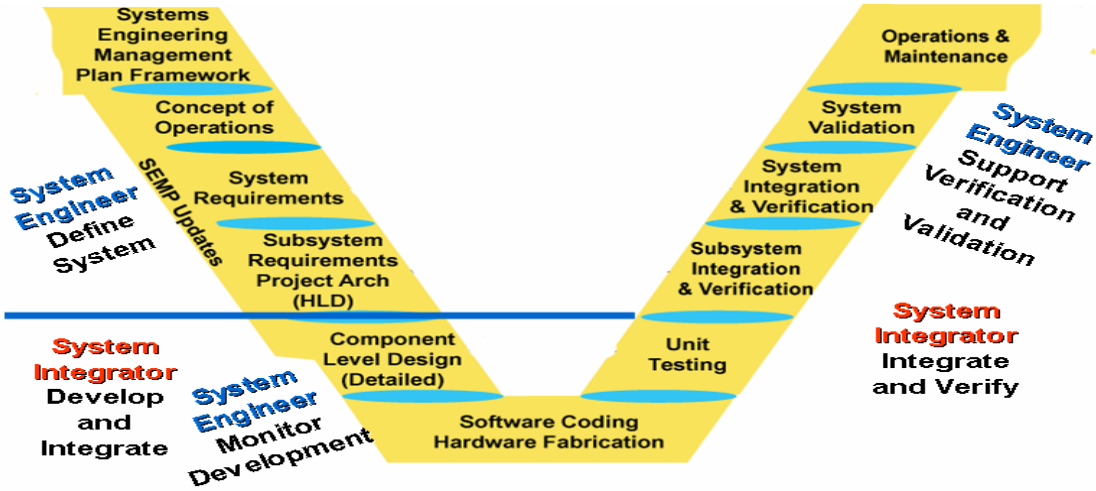

Figure 13-6: Contracting Systems Engineering Services

If an ITS project includes ***minor*** amounts of construction, up to approximately 10% of the cost of the project, then ***flexibility is allowed to have the entire project deployed in the PE phase, without a separate construction phase.*** This option can be very valuable to many ITS projects.

If the construction portion is significant, and a significant amount of system (software procurement and/or software/hardware integration) development is involved, care should be taken to coordinate closely the completion of the system portion with the construction portion to avoid any contract delays. This will be typically performed by different procurement methods - system development by consultant services and construction by low-bid contract.

ITS projects that include a state contribution of funds (STIP funds) have relatively short PE and construction deadlines. These state-mandated deadlines are too short to account for the services of a System Engineer or System Integrator. Therefore, the local agencies must be aware of the need to request time extensions in advance of the deadline in order to be reimbursed for these

services, or classify the construction phase of the consultant's activities as construction engineering. See Chapter 23.2.1, "Timely Use of Funds" of the LAPG for information on STIP deadlines and time extension.

13.10 RECORD KEEPING

The U.S. DOT and the Comptroller General of the United States have the right to access all documents pertaining to federal-aid projects. Nonfederal partners must maintain sufficient documentation to substantiate the costs. Such items as direct labor, fringe benefits, material costs, consultant costs, public involvement costs, subcontract costs, and travel costs should be included in that documentation. **This includes any local-agency costs that are to be reimbursed or used to satisfy matching requirements.** The records for each project must be kept on file for a minimum of three (3) years beyond the payment date of the final voucher.

13.11 REFERENCES

- Title 23 USC Part 103(b)(6), Eligibility for NHS Program
- Title 23 USC Part 133(b), Eligibility for STP Program
- Title 23 CFR Part 172, Administration of Engineering and Design Related Service Contracts
- Title 23 CFR Part 635, Construction and Maintenance
- Title 23 CFR Part 655, Traffic Operations
- Title 23 CFR Part 940, Intelligent Transportation System Architecture and Standards
- Title 28 CFR Part 35, Nondiscrimination on the Basis of Disability in State and Local Government Services (See especially Section 151(b)
- Title 29 USC Part 794d, Rehabilitation Act, Section 508, Electronic and Information Technology
- Title 49 CFR Part 18, Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments
- FHWA Memorandum dated March 22, 2002, Guidance on Federal-aid Eligibility of Operating Costs for Transportation Management Systems
- 2007 Joint Stewardship and Oversight Agreement (FHWA and Caltrans)
- 2007 Systems Engineering Guidebook for ITS, Version 2.0
- LAPM, Chapter 2, Roles and Responsibilities
- LAPM, Chapter 3, Project Authorizations
- LAPM, Chapter 6, Environmental Procedures
- LAPM, Chapter 7, Field Review
- LAPM, Chapter 10, Consultant Selection Procedures
- LAPM, Chapter 11, Design Standards
- LAPM, Chapter 12, Plans, Specifications & Estimate
- LAPM, Chapter 13, Right-of-Way
- LAPM, Chapter 15, Advertise and Award Project
- LAPM, Chapter 16, Administer Construction Contracts
- LAPM, Chapter 17, Project Completion

13.12 WEB SITES

USDOT ITS Websites:

- ITS Overview: www.its.dot.gov/its_overview.htm
- ITS Applications: www.itsoverview.its.dot.gov/
- ITS Benefits: www.itsbenefits.its.dot.gov/
- ITS Costs: www.itscosts.its.dot.gov/
- ITS Lessons Learned: www.itslessons.its.dot.gov/
- ITS Deployments: www.itsdeployment.its.dot.gov/
- ITS Library: www.its.dot.gov/library.htm
- ITS Research: www.tfhrc.gov/its/its.htm

ITS Architecture Resources:

- National ITS Architecture: http://www.its.dot.gov/arch/index.htm
- CA Statewide ITS Architecture: http://www.kimley-horn.com/CAArchitecture/index.htm

Systems Engineering Resources:

- S.E. Handbook – Introduction: http://ops.fhwa.dot.gov/publications/seitsguide/index.htm
- S.E. Guidebook – Comprehensive "how to" guide: http://www.fhwa.dot.gov/cadiv/segb/

ITS Training Websites:

- ITS Prof. Capacity Building: http://www.pcb.its.dot.gov
- National Highway Institute: www.nhi.fhwa.dot.gov/training/brows_catalog.aspx
- (then click on topic #137 – ITS)
- UC Berkeley Tech Transfer: www.techtransfer.berkeley.edu/itstraining
- CITE (training via Internet): www.citeconsortium.org/curriculum.html

Americans with Disabilities Act Websites:

- USDOJ Americans with Disabilities Act website: www.ADA.gov
- USGSA website: www.section508.gov

FHWA Federal-aid Procurement Regulations and Contracting Options Website:
http://www.its.dot.gov/jpodocs/repts_te/3029/chap3.htm#2

13.13 DEFINITIONS

Architecture – See *ITS Architecture* and *National ITS Architecture (NA)* below.

Configuration Management - A process developed to control change in complex information technology based systems.

Center Subsystems - Subsystems that provide management, administrative and support functions for the transportation system. Also one of four general subsystems defined in the NA.

Data Dictionary Entry (DDE) - Contains definitions and description of every data flow included in the logical architecture view of the NA as well as identification of lower level data elements that make up the data flow.

Data Flows - They represent data flowing between processes or between processes and a terminator. A data flow is shown as an arrow on a data flow diagram and is defined in a data dictionary entry. Data flows are aggregated together to form high-level architecture flows in the physical architecture view of the NA. See Data Flow diagram.

Data Flow Diagram - The diagrams in the logical architecture view of the NA that show the functions that are required for ITS and the data that moves between these functions.

Dedicated Short Range Communications (DSRC) - A wireless communications channel used for close-proximity communications between vehicles and the immediate infrastructure. It supports location-specific communications for ITS services such as toll collection, transit vehicle management, driver information, and automated commercial vehicle operations. Also one of four types of interconnects defined in the NA.

Equipment Package - A group of ITS elements that are combined to perform one or more specific functions. A Market Package is generally made up of one or more *Equipment Packages*.

Exempt ITS Project – See Section 13.2.1 above for a full definition and examples.

Functional Requirements - What a system must do to address the needs or provide the services that have been identified for the ITS Project. In a regional ITS architecture, the functional requirements focus on the high-level requirements for providing desired service to the user.

High-Risk ITS Project – (Previously called "Major ITS Project.") An ITS project that has one or more of the seven risk factors identified in Section 13.2 (above) is generally considered a high-risk ITS project. (See also "*Low-Risk ITS Project*.")

Institutional Integration- Represents the process of combining existing and emerging institutional constraints and arrangements.

Interchangeability - The capability to exchange devices of the same type from any vendor without changing the software.

Interconnect - See architecture interconnect. Also applies to traffic signal interconnect.

Interoperability - The capability to operate devices from different manufacturers or different device types (e.g., signal controllers and dynamic message signs on the same communication channel).

Intelligent Transportation Systems (ITS) - Federal regulations (23 CFR 940) defined **ITS** as "*…electronics, communications, or information technology, used singly or in combination, to improve the efficiency or safety of the 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 legal definition, most people say that ITS must 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. (See section 13.1.5 above for further information.)

ITS Architecture - Defines how systems functionally operate and the interconnection of information exchanges that must take place between these systems to accomplish transportation services.

ITS Strategic Plan - A guide for long-term implementation of ITS in the state, metropolitan area or region. It normally includes identifying regional transportation needs and then defining ITS elements to be implemented over time, aimed at meeting those needs. RA is typically a core component of an ITS strategic plan.

Legacy System - Existing transportation systems, communication systems or institutional systems.

Life cycle - Denotes the strategic cycle or sequencing of a specific process.

Logical Architecture - This relates primarily to the software part of the system. It defines the thought or logic processes that perform ITS functions and the information or data flows that are shared between these processes.

Low-Risk ITS Project – (Previously called "Minor ITS Project.") An ITS project that has none of the seven risk factors identified in Section 13.2 (above) is generally considered a low-risk ITS project. (See also "*High-Risk ITS Project*.")

Maintenance Plan - A description of configuration control and update guidelines for regional and/or project ITS architectures. The primary purpose of the maintenance plan is to maintain an architecture baseline.

Market Package – A group of ITS elements that can be combined to perform a *User Service*. A Market Package is generally made up of one or more *Equipment Packages*.

Major ITS Project – See "*High-Risk ITS Project.*" This terminology is obsolete.

Minor ITS Project – See "*Low-Risk ITS Project.*" This terminology is obsolete.

National ITS Architecture (NA)- A common established national framework for ITS interconnectivity and interoperability. It comprises the logical architecture and physical architecture that satisfy a defined set of user services. Maintained by the U.S. Department of Transportation (USDOT), under contract at: http://itsarch.iteris.com/itsarch.

Physical Architecture - This is primarily the hardware part of the system. The part of the NA that provides a physical representation of the important ITS interfaces and major system components. The principal elements of the physical architecture are the subsystems, terminators and the communication interface between them.

Process Specification (PSpec)- The textual definition of the most detailed process identified in the logical architecture view of the NA. The PSpec includes an overview, a set of functional requirements, a complete set of inputs and outputs, and a list of user service requirements that are satisfied by the PSpec.

Project ITS Architecture (PIA)- A framework that identifies the institutional agreement and technical integration necessary to define an ITS project and its interface with other ITS projects and systems.

Protocol Communications - A set of rules for how messages are coded and transmitted between electronic devices. The equipment at each end of a data transmission must use the same protocol to successfully communicate. It is like human language that has an alphabet, vocabulary, and grammar rules used by everyone who speaks that language.

Regional ITS Architecture (RA) - A regional or state level framework for ensuring institutional agreement and technical integration for the implementation of ITS projects or groups of projects. It defines what pieces of the system are linked to others and what information is exchanged between them.

Requirements Definitions - A total set of considerations that govern what is to be accomplished, how well and under what conditions.

Roadside Subsystems - One of four general classes of subsystems defined in the NA. This class is distributed along the transportation network, which performs surveillance, information provision, and control functions. Located on roadway facilities, parking facilities, toll systems, and commercial vehicle check systems that are at or near the roadside.

Sausage Diagram - A top-level diagram, which depicts all subsystems in the NA and the basic communication, interconnects between the subsystems. It can be used as a template for the physical architecture portion of a RA.

SEMP – See *"Systems Engineering Management Plan"* below.

SERF – See *"Systems Engineering Management Plan"* below.

Service Boundaries - The geographic boundary of a specific service or agency that provides a service. An example is the service area of a transit agency. The transit agency provides services within a defined boundary.

Standards - Established and documented technical specifications sponsored by a Standards Development Organization (SDO) to be used consistently by industries or government for interoperability, compatibility, interconnect ability, interchangeability and expandability. Already developed ITS standards can be found in the NA web site by selecting an Architecture Flow.

Subsystem - The principal structural elements of the physical architecture view of the NA. Subsystems are grouped in four classes: centers, roadside, vehicles and travelers.

System Inventory - The collection of all ITS related elements in a RA.

Systems Engineering Analysis - Is a structured process for arriving at a final design of a system. The final design is selected from a number of alternatives that would accomplish the same objectives and considers the total life-cycle of the project including not only the technical merits of potential solutions but also the costs and relative value of alternatives.

***Systems Engineering Review Form (SERF)* –** The SERF is a form containing seven questions about an ITS project, which must be completed for all *Low-Risk* and *High-Risk* ITS projects. See Figure 13.5 for a diagram showing the role of the SERF, and see Section 13.4.1 for a narrative description.

***Systems Engineering Management Plan (SEMP)* -** The SEMP is a set of documents that describe how the systems-engineering elements of a High-Risk ITS project will be managed. See Figure 13.5 for a diagram showing the role of the SEMP, and see Section 13.4.1 for a narrative description. For a full description of the SEMP plus examples, see the FHWA/Caltrans "*Systems Engineering Guidebook for ITS"* at: http://www.fhwa.dot.gov/cadiv/segb/views/process/index.htm

***Systems Engineering "Vee" Process* –** See Figure 13.3 and related narrative, above. For a full description of this process, see the FHWA/Caltrans "*Systems Engineering Guidebook for ITS"* at: http://www.fhwa.dot.gov/cadiv/segb/views/process/index.htm

***Traveler Subsystems* -** Equipment used by travelers to access ITS services pre-trip and en route. This includes services owned and operated by the traveler as well as services that are owned by transportation and information providers. One of four general subsystem classes defined in the NA.

***Turbo Architecture* -** An automated software tool used to input and manage system inventory, market packages, interconnects and architecture flows with regards to RA. The Turbo Architecture is an excellent software tool for developing RA, PIA, development and design of an ITS project. However, the Turbo Architecture must be purchased since it is not a public domain.

***User Services* -** A service that ITS provides the user from the user's perspective. A broad range of users are considered, include the traveling public as well as many different types of system operators. User Services form the basis for the National ITS Architecture development effort. Currently, 33 user services are defined in the NA.

***User Service Requirements* -** Specific statements specifying what must be done to support the ITS user services. The user services requirements were developed specifically to serve as a baseline to drive NA development. The user service requirements are not requirements to system/architecture implementers, but rather are directions to the NA development team.

***V Diagram (or Vee Diagram)* –** See *Systems Engineering Vee Process* above.

***Vehicle Subsystems* -** They are subsystems located in vehicles, which include driver information and safety systems. One of four general subsystem classes defined in the NA.

***Vehicle-to-Vehicle Communications* -** Dedicated wireless system handling high data rate, low probability of error, line-of-sight communications between vehicles. Advanced vehicle services may use this link in the future to support advanced collision avoidance implementations, road condition information sharing, and active coordination to advanced control systems. One of four types of architecture interconnects defined in the NA.

***Wireline Communications* -** A communications link serving fixed locations. It uses a variety of public or private communications networks that may physically include wireless (e.g. microwave) as well as wireline infrastructure. One of four types of architecture interconnects defined in the NA.

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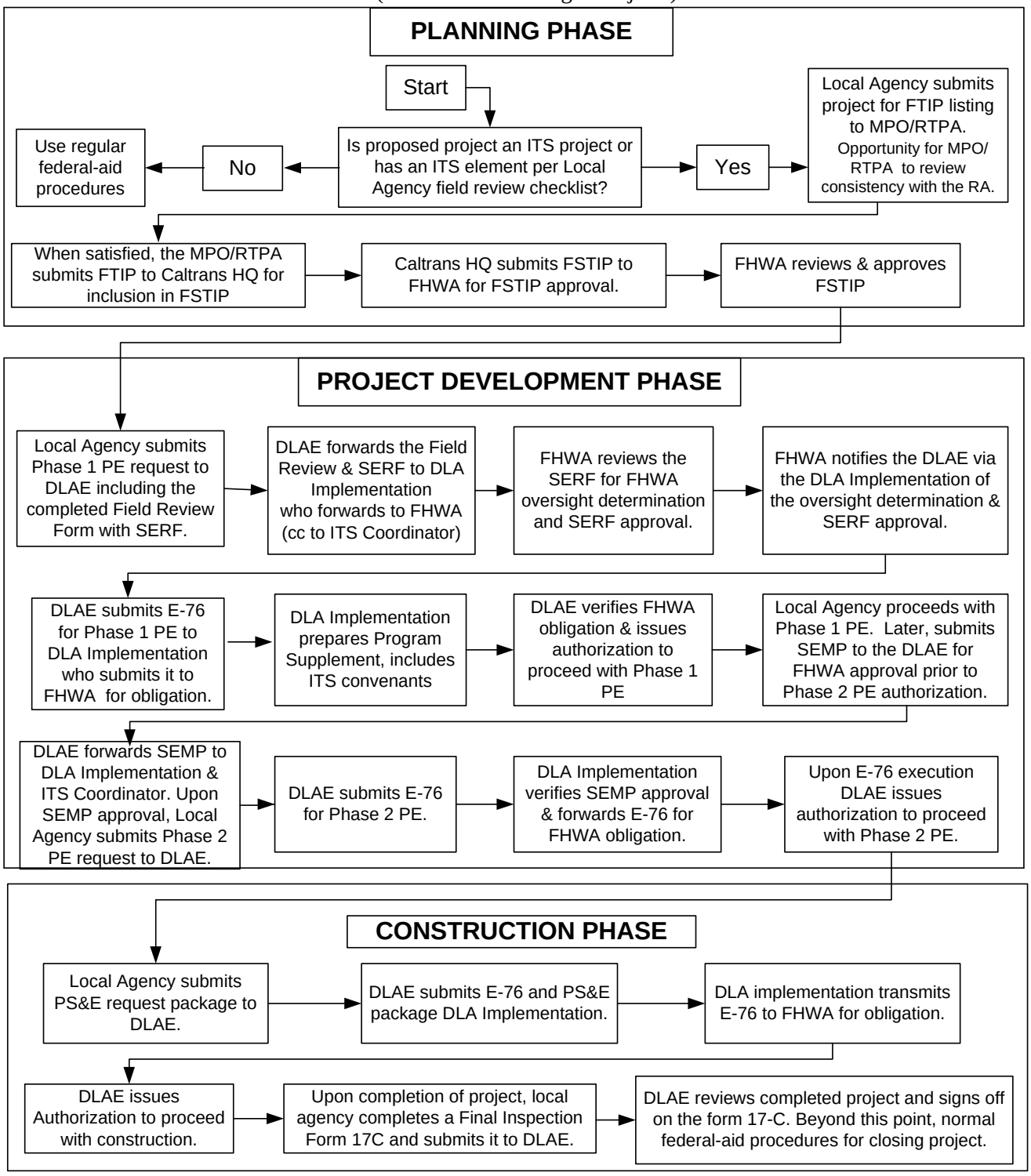
Exhibit 13-A Process Flowchart – High-Risk (Formerly "Major") ITS Projects

(FHWA Full Oversight Projects)



Note:

- This flow chart process does not apply to the earmarked ITS Deployment Projects (QT80 projects).
- This 2-phased PE procedure requires FHWA review of the SERF and approval of the SEMP.
- FHWA Full Oversight for PE phases on all major ITS projects.
- FHWA Full Oversight for E-76 purposes.
- For simplicity, the right of way phase is not shown in this chart. If right of way is involved, refer to Chapter 13,"Right of Way," of the LAPM for information and procedures.
- For FHWA list of criteria for full oversight projects, refer to Section 2.4 of Chapter 2 of the LAPM

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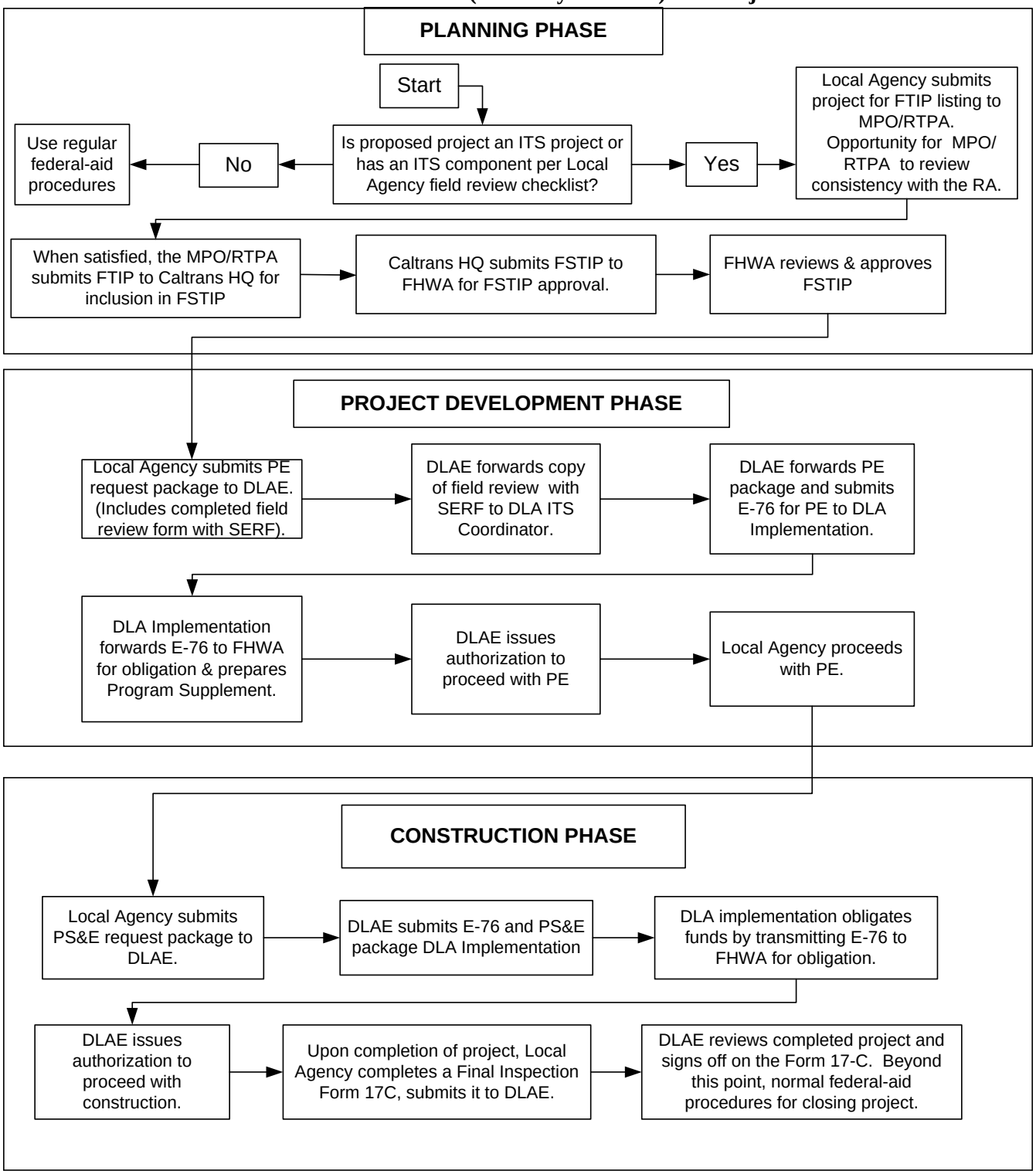
Exhibit 13-B Low-Risk (Formerly "Minor") ITS Projects



Note:

- This flow chart process does not apply to the earmarked ITS Deployment Projects (QT80 projects).
- Minor ITS projects will follow the above traditional single phased PE procedures.
- No FHWA oversight for procedure shown on this flowchart (SERF review and SEMP approval not required).
- State-Authorized for E-76.
- For simplicity, the right of way phase is not shown in this chart. If right of way is involved, refer to Chapter 13, "Right of Way," of the LAPM *for* information and procedures.

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CHAPTER 12 OTHER FEDERAL PROGRAMS

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EXHIBITS

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Exhibit 12-C deleted

Exhibit 12-D1 deleted

Exhibit 12-D2 deleted

Exhibit 12-E deleted

Exhibit 12-F deleted

The STRAHNET is complimented by another 1,700 miles of connectors (additional highway routes) that link more than 200 military installations and ports to the network. While installations may have multiple access/egress routes, the STRAHNET connector is generally the most direct and highest functional class roadway.

As the designated agent for public highway matters, the DOD's MTMC is the proponent for STRAHNET and STRAHNET Connectors. The MTMC identifies STRAHNET and STRAHNET Connectors in coordination with the FHWA, the states' transportation departments, the military services and installations, and the ports.

The ISTEA of 1991 and the National Highway System Designation Act of 1995, provided for inclusion of STRAHNET and STRAHNET Connectors in the 160,955-mile NHS. Federal oversight will ensure optimum maintenance levels for the NHS, thus assuring that the roads can support an emergency deployment.

In addition, the MTMC is also concerned about the traffic safety issues associated with the STRAHNET and STRAHNET Connectors. It is imperative that the number of fatalities, injuries and personal property accidents affecting military personnel are reduced. Therefore, the local agencies, states and FHWA should be cognizant of the need to identify traffic safety issues on this system and program, and appropriate corrective measures.

For official STRAHNET and Update Procedures website:
http://www.fhwa.dot.gov/hep10/nhs

12.6 INTELLIGENT TRANSPORTATION SYSTEMS (moved to Chapter 13)

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Exhibit 12-A

DEFENSE ACCESS ROADS EVALUATION REPORT

a. The narrative report should include as appropriate, but not be restricted to information on:

(1) volume and character of present and future traffic anticipated on the recommended project, as well as a peak-hour turning movement diagram for any major intersection involved,

(2) the percentage of installation traffic compared to total traffic,

(3) personnel strength,

(4) number of shifts worked or to be worked,

(5) a recommended project if warranted or, if no project is warranted, the report should so indicate,

(6) a description of the recommended improvement including a sketch map showing location,

(7) a realistic cost estimate updated to the year of anticipated construction,

(8) a statement to indicate whether similar designs are being used under similar conditions on regular federal-aid, state or local projects in the area. Highway engineering economic analysis should be used as appropriate in evaluating alternatives and justification of the recommended improvements,

(9) discussion of state and/or local plans for improvements in the area including:

(a) priority that the state or local agency has placed on a proposed improvement,

(b) appropriate comments relative to the priority rating furnished by the state or local highway agency,

(c) extent of state or local commitment for participation in need improvements,

(d) an estimate of the date when the work could be accomplished, providing funds were available, and

(e) an estimate of the time (in months) that may be required to accomplish each of the following phases of the recommended project: preliminary engineering, environmental clearance, final design, right-of-way acquisition, and construction including advertisement and award, and

(10) need for control of access to protect the project from obsolescence, especially where a four-lane facility is proposed or will be required at a later date. A determination should be based primarily on the economic justification and desirability of this type of design.

b. Three copies of the narrative report and sketch map are to be submitted to MTMC. If the decision has been made that the project is to be handled by a Federal Lands Highway Division, two additional copies of the report should be furnished to the Federal Lands Highway Division.

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Exhibit 12-B

MILITARY TRAFFIC MANAGEMENT COMMAND ELIGIBILITY CRITERIA

1. Defense Access Roads

a. Military Installations. The Department of Defense has the responsibility for determining the eligibility of proposed improvements for financing with defense access road funds. Generally, projects meeting the following requirements will be considered appropriate for such financing.

(1) Access roads providing new connections between either old or new military installations and main highways may be considered eligible for 100 percent financing with defense access road funds, providing that in urban areas where a new entrance is established and access to a main thoroughfare is via existing city streets, the 100 percent defense access financing extends outward from the reservation only so far as the traffic generated by the installation is greater than other traffic.

(2) Urgently needed improvements of existing highways that are neither a part of nor qualified for inclusion in the federal-aid urban system, but upon which traffic is suddenly doubled (or more than doubled) by reason of the establishment or expansion of a permanent military installation may be considered eligible for financing in whole or in part with defense access road funds. One hundred percent defense access road financing will be considered only on the lightly traveled portion of these highways which are a part of the federal-aid rural system, or which are of insufficient importance to qualify for such designation. The more heavily traveled federal-aid rural highways (upon which traffic is suddenly doubled or more than doubled), generally regarded as being self-supporting from their earnings of road-user revenues, are eligible for only partial defense access road financing.

(3) Urgent improvements needed to avoid intolerable congestion or critical structural failure of any highway serving a temporary surge of defense-generated traffic (such as that which results from the establishment and operation of a temporary military installation, or from large-scale construction activity) may be considered eligible for financing to the extent necessary to provide the minimum essential facility to accommodate the temporary surge of traffic. A temporary surge of traffic is defined as one of several months duration, at least, but very short in duration as compared to the total life of a normal highway improvement.

(4) Alteration of a public road in the immediate vicinity of a military installation to accommodate regular and frequent movements of special military vehicles such as tank transporters or heavy ammunition carriers may be financed with defense access road funds, provided it is impractical or uneconomical to acquire right-of-way and develop such roads for exclusive military use. However, highway funds from other sources should finance any improvement that may be needed to bring the highway to a stage satisfactory for accommodation of all traffic except the special military vehicles.

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APPENDIX B FINANCING THE STATE FUNDED HIGHWAY PROGRAM

CONTENTS

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APPENDIX B FINANCING THE STATE FUNDED HIGHWAY PROGRAM

I. STATE BUDGET PROCESS

The State Budget process is a continuous operation carried out at various levels within the State of California. The process includes the development, review and adoption of the State's annual financial plan or budget. There are two major decision-making groups in the budget process: the Governor (Executive Branch), and the Legislature. Together, they determine what is or are not included in the budget. Separately, each plays a distinct role in the development and approval of the budget.

EXECUTIVE BRANCH

Article IV, Section 12, of the State Constitution requires the Governor to annually submit to the Legislature, by January 10, a budget for the upcoming fiscal year. The Governor assigns the responsibility for the preparation of the budget to the Director of the Department of Finance and his staff. The Department of Finance works with the various Agencies and Departments on the preparation of the Governor's Budget. The Agency's Secretaries, as a part of the Governor's Cabinet, are called upon to guide the Departments for which they have responsibility. The Departments, in turn, are responsible for the development of the budget for their program areas on behalf of the Governor. It is also the Departments' responsibility to administer and carry out the decisions made during the budget process.

LEGISLATURE

Article IV, Section 12, of the State Constitution requires the Legislature to adopt an annual budget. All funds under the custody of the State (this includes federal-aid funds) must be appropriated by the Legislature before they can be expended. The Legislature approaches its consideration of the Governor's Budget, as it does for all other legislation, as a representative body of the people of the State of California. Since the Government achieves most of its objectives through programs and activities funded by the budget, its review by the Legislature including input from the public, has direct impact upon State policy and may result in significant changes to existing program objectives and activities. The Legislature assigns the in-depth review of the Governor's Budget to the Legislative Analyst's Office which is a non-partisan staff to both Houses of the Legislature. The Legislative Analyst's Office makes recommendations to the Legislature after this review.

CTC

An additional decision-making body in directing transportation policy and programs is the California Transportation Commission (CTC). The CTC plays a dual role by providing input to the Legislature on the adequacy of the Department's Budget in meeting the State transportation objectives and goals, as well as participating in the administration of the budgeted funds for the Department. The primary responsibility for the CTC lies in its authority to allocate funds for all capital projects and local assistance funds which have been appropriated in the annual budget.

THE BUDGET PROCESS CALENDAR

DATE	ACTIVITY
May	1 Budget Guidelines Issued
June	2. Finance Budget Policies
April-June	3. District/Divisions Develop Budget Requests
June	4. Program Managers Formulate Issues
June-July	5. Budgets reviews Preliminary Budget Change Proposals (BCPs)
July-August	6. Director's Decision
September 15	7. Caltrans Proposed Budget to Business, Transportation & Housing Agency (BT&H) and Department of Finance
October-November	8. BT&H Agency hearings
November	9. Governor's Review
December 1	10. BCPs to Legislative Analyst
January 10	11. Governor's Budget - Budget Bill
February	12. CTC Response to Legislature
February	13. Legislative Analyst's Report
March-April	14. Response to Legislative Analyst Report
April	15. Budget Augmentation
March April	16. Supplemental Legislative Analyst Report
April-June	17. Legislative Review
June 30	18. Governor Signs Budget Bill

BUDGET TIMELINE

The following describes the major activities of the budget process:

1. Budget Guidelines Issued (May - 14 months prior to fiscal year)
Caltrans - Division of Budgets (Budgets) issues budget guidelines to the districts/divisions and the program managers/advisors.

2. Finance Budget Policies (June)
Various Budget Letters, price data, and schedules are issued by the Departments of Finance and General Services, and the State Controller, as part of the budget process.

3. Districts/Divisions Develop Budget Requests (April - June)
The focus of budget requests should be on transportation policy, emphasizing what is to be accomplished and how the objectives and goals of the Department are to be achieved. This process is a necessary step, as it is at the district/division level that the actual programs of the Department are carried out and needs are known.

The Division of Local Assistance (DLA) determines Local Assistance Capital Outlay Budget. The budget is an estimate of what the capital outlay requirements will be for each of the local assistance programs.

4. Program Managers/Advisors Formulate Issues (June)
The program managers assign review of budget requests to the appropriate Headquarters' functional program advisors. During their review, the program advisors must take into consideration the current program definitions to make sure that the changes requested are consistent with the stated definitions**.**

5. Preliminary BCPs (June - July)
The main purpose of this review is to ensure that the BCP is sound and, to the greatest extent possible, will survive the review of the Department of Finance and the Legislative Analyst's Office.

6. Director's Decisions (July - August)
The Director has the responsibility to decide which BCPs will be included in the Department's proposed budget for submittal to the Department of Finance and the BT&H Agency.

7. Departments Proposed Budget BT&H Agency and Department of Finance (September 15)
By September 15, the Department must submit its proposed budget to the BT&H Agency and to the Department of Finance. The proposed budget is structured by program rather than by district/division and is composed of two major parts: 1) Baseline, and 2) BCP

1) The Baseline Budget provides for current programs and activities at adjusted cost levels (Price Letter information) for current and budget years, but does not include any policy or program changes.

2) The BCPs are prepared in response to the Department's desire to change its programs or activities, or to increase or decrease its resources from the level in the Baseline Budget.

8. Agency Hearing (October - November)
During the months of October and November, the Secretary of the Agency, assisted by the Department of Finance, conducts meetings with representatives of the Department to review the Baseline Budget and BCPs.

9. Governor's Review (December)
The Secretary of the Agency with the Director of Finance, present to the Governor the BCPs which require Executive Office review.

10. BCPs to Legislate Analyst (December)
Copies of all BCPs included in the Governor's Budget are forwarded on December 15, to the Legislative Analyst's Office by the Department of Finance.

11. Governor's Budget/Budget Bill (January 10)
On January 10, the Governor submits to the Legislature a budget containing itemized statements of recommended sources and uses of resources for all Departments and activities in the State. This is the printed budget and is referred to as the Governor's Budget.

12. CTC Response to Legislature (February)
Chapter 1106, Statutes of 1977, (AB 402), requires the CTC to submit annually to the Legislature an evaluation of the Governor's Budget and the adequacy of resources available to the Department.

DLA reviews the proposed local assistance budget and provides input on the adequacy of the proposed budget to meet the needs of the local assistance program.

13. Legislative Analyst's Report (February)
The Legislative Analyst reviews the Governor's Budget and prepares its report, "Analysis of the Budget Bill," which is issued in February.

14. Response to Legislative Analyst's Report (March - April)
After the Legislative Analyst's Office issues its report, "Analysis of the Budget Bill," the Department prepares responses to the issues raised in the Report.

15. Budget Amendments (April)
When there is a need for adjustments to the Governor's Budget, the Department prepares a written request to the Department of Finance (called a Finance Letter). Agency and the Department of Finance reviews the requests and decides which requests, if any, should be sent to the Legislature as revisions to the Governor's Budget.

16. Supplemental Leave Analyst's Report (March - April)
After the Legislative Analyst has reviewed outstanding issues and received input from the Department, the "Supplemental Analysis of the Budget Bill" is prepared.

17. Legislative Review (April)
The Financial Committee of each House appoints subcommittee and assigns them review responsibility for portions of the Budget Bill. After completion of its hearing, each subcommittee prepares a report with recommendations on its assigned positions of the Budget Bill and presents it to its respective financial committee for action.

18. Governor signs Budget Bill (June 30)
The Budget Bill becomes the Budget Act after it is passed by both Houses and signed by the Governor.

19. Division of Local Assistance receives local assistance budget allocation. (July)
DLA compares the allocations in the Budget Bill to what was requested earlier. Allocations are then divided among the different local assistance programs.

II. PROGRAM MANAGEMENT

Part of the responsibilities of the Office of Resource Management and STIP coordination of the DLA, working with Local Programs Accounting, is to ensure individual program allocation are used effectively and that actual expenditures are within the appropriations made in the Budget Act.

BUDGETED FUNDS

The expenditures of budgeted funds can be spread over several years. There are two important concepts to be considered when talking about expenditures:

- **Availability:** the time period during which budgeted funds may be committed for a purpose, whether by payment or by encumbrance.

- **Liquidation:** the period of time following the end of availability when an encumbrance may be paid off. Liquidation may occur during the availability period.

III. PROJECT EXPENDITURES

At noted in Chapter 1, "Introduction/Overview" of this manual, the legislature has created many different State funded local assistance programs to help finance local transportation projects. Because each of the programs was developed to meet different purposes, the reimbursement process varies from program to program. Each program chapter outlines the reimbursement process for that program. In addition, there is the CTC "Financial Guidelines," attached as Appendix A that supplements the reimbursement process for several of the programs.

AGREEMENTS

In general, once the Budget Bill is signed by the Governor, the State local assistance funds allocated for that fiscal year are available for expenditure. The key element that has to take place with all the State funded local assistance programs before any expenditures can take place is the execution of an "Agreement." Depending on the program this could involve a Master Agreement, Program Supplement Agreement and/or a yearly specific Agreement for the funds allocated for that fiscal year, see Chapter 4 "Agreements" in the *Local Assistance Procedures Manual* (LAPM).

More than one local agency has lost out on State funds for their project because they did not execute an Agreement in a timely manner. In the Budget Act or when the programs are established by legislation most of the programs have set "Availability" periods for when the funds are available for encumbrance. To encumber the funds, it requires the **execution** of an Agreement. Just having an Agreement issued by DLA does not guarantee that funds will remain encumber for a project. If an Agreement is not returned before the end of the availability period then the funds that were encumbered will have to be disencumbered and transferred to another project or program that can use the funds before the end of the availability period.

Local agencies are advised to make sure that when they receive an Agreement that they execute the Agreement in a timely manner. In addition, local agency should read through the individual program guidelines outlined in the following chapters so that they are aware of cut off dates for the availability of the funds. As part of reengineering, the District Local Assistance Offices no longer have the staff to monitor the Agreement; local agencies are now responsible for tracking their own Agreements.

INVOICES

Even with an executed Agreement there is no guarantee that the encumbered funds will always be there. Most State local assistance programs have set "liquidation" periods established by legislation or in the Budget Act. Therefore, local agencies are advised to submit invoices in a timely manner or not receive all the funds that were encumbered for their project. In addition, local agencies should read through the individual program guidelines outlined in the following chapters, so that they are aware of liquidation time limits. Again as part of reengineering, the District Local Assistance Offices no longer have the staff the monitor project progress, local agencies have been delegated this responsibility.

IV. FUTURE FINANCING RECOMMENDATIONS.

Even with the difference in the reimbursement process for each program, most will find that these processes are far simpler than the reimbursement process required for federal-aid programs. Even though these processes might be simpler that does not mean they are perfect. If you think that there might be areas for improvement, we would welcome your suggestions. As you read the guidelines for each of the different programs you will note that most of the programs have had changes to the procedures and processes. These changes came as a result of recommendations made by those of you that utilize the programs.

Recommendations can be made directly to the District Local Assistance Engineer (DLAE), to the DLA, or through legislative representative in your area. Some of the major changes to the reimbursement process have come from recommendations made via the various organizations, like: Coalition of Self-help Counties, League of California Cities and County Engineers Association of California. You are encouraged to discuss and work with these organizations on any changes which you think should be made.

OVERSIGHT

Interstate - For Interstate projects on the NHS over $1 million (except 3R projects), the FHWA has overall responsibility for ensuring compliance with all federal requirements.

For all other projects, FHWA responsibility for ensuring compliance with federal requirements is limited to non-Title 23 activities (right of way and civil rights).

High-Risk (formerly "Major") Intelligent Transportation Systems (ITS) Projects (both NHS and non-NHS) - An ITS project that implements part of a regional ITS initiative that is multi-jurisdictional, multi-modal, or otherwise affects regional integration of ITS systems.

The local agencies must submit a Systems Engineering Management Plan (SEMP) for all High-Risk (formerly "Major") ITS projects to FHWA for approval prior to authorization (E-76) for detailed component design. See Chapter 13, "Intelligent Transportation Systems (ITS) Program", of the LAPG for details.

Low-Risk (formerly "Minor") ITS Projects - These ITS projects do not require a System Engineering Review Form (SERF) or SEMP approval by Caltrans or FHWA. However, the SERF still must be filled out as part of the field review package. The procedures for Low-Risk (formerly "Minor") ITS projects will follow the traditional one-Phase Federal-aid Preliminary Engineering procedures.

Exempt ITS Projects – These ITS Projects do not require a SERF neither SEMP. The procedures for Exempt ITS projects will follow the procedures of other traditional projects.

While its is the FHWA's policy to rely primarily on their Program Review/Product Evaluation Program to carry out these responsibilities, other process review techniques, including project-specific activities may be used when appropriate.

2.8 CALTRANS RESPONSIBILITIES

Caltrans is responsible to the FHWA for administering the successful implementation of federal-aid programs and projects in accordance with laws, regulations, and policies that govern the federal-aid program. Caltrans also administers the implementation of state funded programs and projects for the CTC and State Legislature.

These responsibilities are divided into three areas: Policy and Procedures, Program Management, and Project Implementation.

POLICY AND PROCEDURES

Caltrans establishes uniform policies and procedures to assist the local agencies in meeting the program requirements for their projects. Caltrans in collaboration with FHWA interprets federal and state laws, rules and regulations, and provides guidance in the form of manuals, guidebooks, handbooks, reference materials and service, and training to assist the agencies in planning, designing, constructing, and maintaining their transportation systems.

Caltrans policy and procedure development is achieved in coordination and consultation with the FHWA, representatives of local agencies, MPOs, RTPAs, other affected agencies, and organizations.

PROGRAM MANAGEMENT

Each specific local assistance program provides funding which requires distribution, management, and oversight control to ensure that the funds are expended in accordance with the program requirements and that allocations and budget authority are not exceeded. Caltrans distributes both state and federal fund allocations to the MPOs, RTPAs, cities, counties and others as specified by law.

Once the distributions are established, Caltrans provides program guidance for their expenditure. Some programs may require annual or periodic project application and selection to establish eligibility lists. Caltrans also monitors project implementation to ensure that the projects are implemented in a timely manner to achieve program goals. LAPG manual describes each current program.

PROJECT IMPLEMENTATION

Some major federal-aid project implementation steps delegated by the FHWA to Caltrans cannot be further delegated to the local agency level and remain Caltrans' responsibility. These include:

- Approval of Authorization to Proceed (E-76) for projects that are State-Authorized
- Preparation of Agreements
- Decision to hold Field Review for NHS projects
- Approval of Local Agency DBE Program/Annual Anticipated DBE Participation Level
- Pre-award audit review of consultant contracts >$250,000

- Approval of Utility Relocation Agreements involving federal reimbursement
- Approval of Specific Authorization for Utility Relocation involving federal reimbursement
- Independent Assurance Sampling and Testing (IAST) for NHS projects
- Approval of payments from the State Controller

The individual chapters covering these topics should be consulted for details concerning the responsibilities. Where the FHWA has not delegated final approval, Caltrans monitors local agency activities, reviews or prepares documents, and makes recommendations to FHWA. For example, Caltrans will review all environmental documents for completeness and sufficiency before submitting them to FHWA for approval. **Note: Pursuant to the SAFETEA-LU, Sections 6004 and 6005 and respective implementing MOUs, FHWA assigned and Caltrans assumed responsibilities for NEPA compliance and approval.**

Caltrans also provides assistance to the local agencies in interpreting the regulations, manuals and guidelines as they apply to specific project conditions. The District Local Assistance Offices and Headquarters DLA personnel are available to aid the local agency through the required process and procedural steps.

Where expertise is not otherwise available, the local agency may also request assistance from Caltrans technical specialists in solving special technical problems. Environmental issues, engineering services, right of way concerns, hazardous wastes, labor compliance, equal employment opportunity, Title VI, and Disadvantage Business Enterprise are among these areas where assistance is available. The use of this expertise must be requested early and be well coordinated to assure that Caltrans limited resources and personnel will be available when needed.

PROCESS REVIEWS

As outlined in Chapter 19 “Process Review,” of the *Local Assistance Procedures Manual* (LAPM), Caltrans and FHWA will use the process review as the main method to determine if local agencies are in compliance with all federal-aid laws, regulations, and procedures. The process reviews will be used to evaluate all aspects (including Title 23 requirements) of the local agencies federal-aid program and to improve local assistance procedures.

MAINTENANCE REVIEWS

Annually, Caltrans reviews project maintenance for selected agencies using federal-aid funds so that every agency is covered during a four-year cycle. Chapter 18 “Maintenance,” of the LAPM describes these maintenance review procedures in detail.

2.9 CITY, COUNTY AND OTHER LOCAL PUBLIC AGENCY RESPONSIBILITIES

The cities, counties, joint power authorities, transit agencies and other public agencies have the primary responsibility for implementing the specific projects which carry out the programs described in this manual. Nonprofit entities may also qualify for this. For the purpose of this manual, these agencies/entities are commonly called local agencies.

PROJECT IMPLEMENTATION

The local agency is responsible for the conception, planning, programming, environmental investigation, design, right of way, construction and maintenance of the projects on their local transportation system. It must ensure that its staff members, consultants and contractors comply with the applicable state and federal laws, regulations and procedures in developing, and constructing its projects.

If a local agency has never implemented a federal-aid or state funded project, or does so infrequently; it should review the processes with the DLAE prior to beginning any implementation activity. It may wish to seek the administrative services of another agency, which is more familiar with the process and procedure details.

The local agency is delegated decision-making authority and responsibility for most design and construction-related activities of federal-aid projects. These include:

- Getting the project into the FSTIP
- Preparing the Request for Authorization for each project phase
- Decision to hold field review for projects off the NHS
- Determining/Approving project DBE Availability Advisory percentage
- For ITS projects and other projects with ITS elements, make a preliminary classification of High-Risk, Low-Risk, or Exempt.
- Selecting consultant and approving consultant contracts
- Approving local design standards for projects off the NHS
- Approving design exceptions for projects “off” the NHS
- Preparing and Certifying PS&E (Caltrans must approve the local agencies’ PS&E procedures for most NHS projects and FHWA for Full Oversight NHS projects)
- Qualifying/selecting right of way consultants
- Certifying right of way
- Right of Way acquisitions and relocation
- Preparing and approving Quality Assurance Programs (non-NHS projects only)
- Advertising and awarding construction project
- Construction contract administration and inspection (Caltrans must approve the local agencies construction administration procedures for high cost, complex, corridor-type NHS projects)
- Construction contract acceptance (FHWA will make final inspection of projects that are Full Oversight)
- Coordinating railroad agreements
- Contract compliance

The individual chapters covering these topics should be consulted for details concerning the responsibilities.

EXHIBIT 2-B FEDERAL-AID LOCAL ASSISTANCE RESPONSIBILITIES

ACTIVITY	**Projects on the National Highway System (NHS)** (Excluding Interstate[1]) State-Authorized	**Projects not on the NHS** State-Authorized	COMMENTS
Project Authorizations (Chapter 3)			
Prepare "Request for Authorization"	Local Agency	Local Agency	
Approve "Authorization to Proceed" (E-76) for each project phase	State	State	Authorization must precede any reimbursable activities.
Obligate Funds	FHWA	FHWA	
Approve SEMP for High-Risk ITS Projects	FHWA	FHWA	Refer to Chapter 13 of LAPG, ITS Program
Agreements (Chapter 4)			
Prepare Agreements	State		
Execute Master Agreement/Program Supplements	Local Agency/State		
Invoices (Chapter 5)			
Prepare Invoices	Local Agency		
Approve Payment	State		
Environmental Procedures (Chapter 6)			
Conduct preliminary investigations and complete Preliminary Environmental Studies Form (PES)	Local Agency		
Concur with required technical studies and NEPA Class of Action)	State		
Conduct required technical studies and prepare technical reports and NEPA document (CE, EA, EIS)	Local Agency		Complete PES and attend early coordination meeting before starting technical studies.
Review technical reports and NEPA document	State		
Determine adequacy of technical reports, conduct interagency consultation and approve NEPA document	State		

[1] Projects on or impacting the Interstate regardless of funding will require a project-by-project review by FHWA. For these and all projects on state highways, the local agency should coordinate closely with the DLAE and District Project Development Manager to ensure that all required authorizations/obligations and other reviews and approvals are obtained in a timely manner and in accordance with state highway development procedures. Early consultation by Caltrans with FHWA will aid in coordination for necessary involvement and needed approvals, if any.

FEDERAL-AID LOCAL ASSISTANCE RESPONSIBILITIES			
ACTIVITY	**Projects on the National Highway System (NHS)** (Excluding Interstate[1]) State-Authorized	**Projects not on the NHS** State-Authorized	COMMENTS
Field Review (Chapter 7)			
Decision to hold Field Review	State (See Comments)	Local Agency	State required Field Reviews limited to high cost, complex, corridor-type NHS projects.
Prepare Field Review Form	Local Agency	Local Agency	
Attend/Sign Field Review Form	Local Agency, State and FHWA	Local Agency	State will (and FHWA may) attend all required NHS Field Reviews, and others when appropriate.
Public Hearings (Chapter 8)			
Decision on Type of Public Hearing	Local Agency		Formal or Open Forum
Approval to circulate EA/EIS	FHWA		Public hearings are held after the EA or Draft EIS has been approved.
Civil Rights & Disadvantaged Business Enterprises (Chapter 9)			
Provide Civil Rights Assurances	Local Agency (In Master Agreement and Program Supplements)		
Complaint Investigations/Contractor Compliance	Local Agency		May be assisted by State
Local Agency Compliance Reviews	State/FHWA		
Approve Local Agency DBE Annual Anticipated DBE Participation Level	State		
Determine/Approve Project DBE Availability Advisory Percentage	Local Agency		
Consultant Selection (Chapter 10)			
Select Consultant and approve contract	Local Agency		
Pre-award audit	State		Limited to Contracts >$250,000

[1] Projects on or impacting the Interstate regardless of funding will require a project-by-project review by FHWA. For these and all projects on state highways, the local agency should coordinate closely with the DLAE and District Project Development Manager to ensure that all required authorizations/obligations and other reviews and approvals are obtained in a timely manner and in accordance with state highway development procedures. Early consultation by Caltrans with FHWA will aid in coordination for necessary involvement and needed approvals, if any.

Underutilized Disadvantaged Business Enterprise (UDBE) - A firm meeting the definition of a DBE as specified in 49 CFR, Part 26 and is one of the following groups: African Americans, Asian-Pacific Americans, Native Americans, and Women.

3.2 PRIOR TO FEDERAL AUTHORIZATION

Prior to federal authorization, all federally funded transportation projects must be included in the current federally approved Federal Transportation Improvement Program/Federal Statewide Transportation Improvement Program (FTIP/FSTIP). The FTIP/FSTIP (or amendment thereto) must identify scope of work, project location, project sponsor, federally funded phases of work, programmed FFY, and the types and amounts of federal funds. ER projects that involve substantial functional, locational, or capacity changes also must be included in the FTIP/FSTIP.

For ITS projects and other projects with ITS elements, a preliminary classification of the project should be made as High-Risk (formerly "Major"), Low-Risk (formerly "Minor"), or Exempt. For further explanation, reference the Chapter 13 "Intelligent Transportation Systems (ITS) Program," of the LAPG.

Non capacity increasing projects funded by the following federal programs are typically included in Caltrans' administered Lump Sum listing of projects. The following Lump Sum listings of projects are developed, in cooperation with the MPOs/RTPAs and local agencies:

- Highway Bridge Program (HBP previously HBRRP)
- Local Seismic Safety Retrofit Program (LSSRP)
- Highway Safety Improvement Program (HSIP)
- Safe Routes to School (SRTS) Program
- Railroad Grade Crossing Program

Note: *Transportation Enhancements (TE) funded projects are now programmed in the State Transportation Improvement Program (STIP) (*see Chapter 23 "Local Agency State Transportation Improvement Projects," *of the LAPG for requirements associated with federally funded STIP projects).*

Projects funded with regionally programmed Surface Transportation Program (STP) or Congestion Mitigation and Air Quality Improvement (CMAQ) funds may be included in a Regional Lump Sum listing of projects as adopted by the appropriate MPO/RTPA. The RTPA/MPO is responsible for project eligibility determination and financial constraint of the regional program. When a local agency requests federal authorization of a project, the MPO/RTPA's approved list of projects must be provided to the Caltrans District Local Assistance Engineer (DLAE).

Planning type projects funded with PL (MPO Planning Funds) or Section 5303 funds are not required to be listed in the FTIP/FSTIP when they do not lead to construction, however, these projects must then be included in a federally approved planning document such as Overall Work Plan (OWP).

Soon after a project is selected and programmed for inclusion or amended into the FTIP/ FSTIP, the sponsoring agency should contact the Caltrans DLAE to discuss how and when they plan to proceed with project implementation. The discussion should cover the timing and process for the authorization/obligation of federal funds, whether a "Formal Field Review" is required or recommended (see Chapter 7, "Field Reviews," of the LAPM), and the California

Transportation Commission (CTC) allocation(s) of STIP funds, if necessary.

If federally funded work is to be performed by a consultant or contractor, the local agency must have a Caltrans approved California Department of Transportation Disadvantaged Business Enterprise Implementation Agreement (Exhibit 9-A) and the approved Local Agency DBE Annual Submittal Form (Exhibit 9-B). The Local Agency DBE Annual Submittal Form is due to the DLAE by June 1 of each year for the following FFY. (See Chapter 9, "Civil Rights and Disadvantaged Business Enterprise," of the LAPM.)

3.3 REQUEST FOR AUTHORIZATION

The project sponsor identified in the FTIP/FSTIP to receive the federal funds is responsible for requesting the Federal Authorization to Proceed. The project sponsor must prepare and submit a "Request for Authorization to Proceed" package to the appropriate Caltrans District Local Assistance Office. The request package should include, as a minimum, the agency's "Request for Authorization to Proceed"(see Exhibits 3-A, B, C, or D), "Request for Authorization to Proceed Data Sheets(s)" (see Exhibit 3-E), and all required support documentations. The Caltrans District Local Assistance Office must submit to Caltrans Headquarters Division of Local Assistance (DLA), the "Federal Project Log Sheet" (Exhibit 3-G) with the appropriate documents attached.

If the Request for Authorization package is complete and all federal and state requirements have been satisfied, a minimum of three (3) weeks processing time should be allowed to receive federal Authorization to Proceed for "State-Authorized" projects. Another week or more may be required for "Full Oversight" projects that require FHWA authorization. Additional time may also be required near the beginning or end of the FFY.

If the "Request for Authorization to Proceed" package is incomplete, unacceptable or missing information that cannot be quickly obtained by FAX, telephone, e-mail, or other source, the package will be returned to the local agency for resubmittal.

PRELIMINARY ENGINEERING

Eligible preliminary engineering (PE) work includes location and environmental studies, NEPA approval (Chapter 6, "Environmental Procedures," of the LAPM), final design (Plans, Specifications and Estimate [PS&E]) and other related work including the cost of advertising leading to physical construction of a project. Preliminary R/W studies, as needed for NEPA compliance (see Chapter 13, "Right of Way," of the LAPM), may be considered eligible and authorized as part of PE.

Only eligible work performed after the date of federal authorization is eligible for federal reimbursement. The preliminary studies portion of PE may be authorized prior to an optional or mandatory field review (see Chapter 7, "Field Reviews," of the LAPM). This allows for the reimbursement of selecting consultants and other specialists who may be needed for field review. However, a completed Field Review form shall be submitted to Caltrans within four-months from the initial PE authorization. Otherwise, the authorization to proceed will be canceled automatically.

"Authorization to Proceed with PE" must lead to R/W acquisition or construction in a timely manner. Per 23 CFR 630.112 (c)(2), if R/W is not acquired or a construction contract is not awarded by the close of the tenth fiscal year following the year of PE authorization, any expended federal funds must be returned to the federal government, unless a time extension is granted by the FHWA.

INTELLIGENT TRANSPORTATION SYSTEMS

For Intelligent Transportation Systems (ITS) projects, PE includes Systems Engineering, equipment, software development, and use of a Systems Manager or Systems Integrator (see Chapter 13 "Intelligent Transportation Systems (ITS) Program," of the LAPG for details on Systems Engineering and the project development process for ITS projects).

The Systems Engineering analysis of High-Risk (formerly "Major") ITS projects, as defined in Chapter 13 of the LAPG, must be approved by the FHWA prior to advancing to detailed component design. Therefore, High-Risk ITS projects require two separate PE phase authorizations. The Systems Engineering Review Form (SERF) of High-Risk ITS projects must be approved by FHWA prior to, or shortly after (if prepared by a consultant) the first PE authorization. Development of the Systems Engineering Management Plan (SEMP) is contingent upon federal review comments and approval of the SERF. FHWA approval of the SEMP is required prior to the second PE authorization and proceeding to final detailed design.

Low-Risk (formerly "Minor") ITS projects can undergo the traditional one PE phase authorization and will not require FHWA approval of the SERF and SEMP. However, the local agency still must complete the SERF, as part of the Field Review Form.

Exempt ITS projects can undergo the traditional one PE phase authorization and will not require the SERF and SEMP.

RIGHT OF WAY

Eligible Right of Way (R/W) work includes the preparation of R/W plans, making economic studies, other R/W related-preliminary work, appraisal for parcel acquisition, review of appraisals, payments for real property acquired, preparation for and trial of condemnation cases, management of properties acquired, furnishing of relocation assistance, and other related labor expenses (see 23 CFR 710 for details). This work is covered in the local agency's "Request for Authorization to Proceed with Right of Way," (Exhibit 3-B of this chapter). **Only eligible work performed after federal "Authorization to Proceed" with R/W may receive federal reimbursement.**

As noted above, some R/W activities necessary for the completion of the NEPA process may be authorized as part of PE. However, an approved NEPA document is required prior to the majority of R/W activities (e.g., negotiating with property owners, acquisition and relocation assistance, see Chapter 13, "Right of Way," of the LAPM). The request for R/W authorization must include an approved NEPA document and completed Field Review Form if not submitted previously.

RIGHT OF WAY UTILITY RELOCATIONS

If federal reimbursement is sought for utility relocations (adjustments), all work must be performed in accordance with the FHWA's "Alternate Procedure" 23 CFR 645.119 (e)(2). Refer to Chapter 14, "Utility Relocations," of the LAPM for detailed information and procedures related to eligible costs, required federal actions (Authorization to Proceed [E-76], FHWA Specific Authorization to Relocate Utilities and FHWA Approval of Utility Agreement[s]), sequence of activities, notifications, support documentation and federal reimbursement.

The DLAE must identify the name of the utility owner, type of facility, and estimated cost to relocate/adjust each utility in the "State Comments" section of the E-76.

IMPORTANT: If federal funds are used to finance any phase of work on a project, all project R/W activities, including utility relocation must conform to requirements of 23 CFR, Part 645. Failure to comply will jeopardize federal funding.

CONSTRUCTION AND CONSTRUCTION ENGINEERING

Eligible construction costs include, the actual cost to construct the highway itself including its appurtenant facilities and any removal, adjustment or demolition of buildings or major obstruction, utility or railroad work that is a part of the physical construction of the project construction engineering, and administrative settlement of cost for contract claims.

Federal "Authorization to Proceed" with construction must be received prior to advertising the construction contract. **Projects advertised prior to federal authorization are NOT eligible for federal reimbursement.**

The request package for "Authorization to Proceed" with construction must include a Field Review form, a copy of the approved NEPA document (either a signed Categorical Exclusion [CE], Finding of No Significant Impact [FONSI], or Record of Decision [ROD]), if not previously submitted, approved Right of Way Certification, project finance letter, engineer's estimate, PS&E Certification (Exhibit 12-C), PS&E Checklist (Exhibit 12-D) and PS&E package.

For SAFETEA-LU major projects of $100 million or more, an annual Financial Plan must be prepared prior to Construction Authorization, and submitted to the DLAE with the request for construction authorization. Major projects of $500 million or more, the preparation and submittal of a draft Project Management Plan is required prior to environmental approval. Both the Financial Plan and Project Management Plan are to be submitted to the DLAE. The requirements for both of these plans are discussed in Chapter 2 "Roles and Responsibilities," of the LAPM.

Construction Engineering (CE) includes, the supervision and inspection of construction activities, additional staking functions considered necessary for effective control of the construction operations, testing materials incorporated into the construction, checking shop drawings, and measurements needed for establishing pay quantities. CE costs must be specifically included in the "Authorization to Proceed with Construction" and authorized to be eligible for federal reimbursement. CE costs must also be included on the project finance letter. If CE is authorized after construction begins, only those CE costs incurred after the date of the CE authorization are eligible for federal reimbursement.

Typically, the federal reimbursement of CE costs is limited to 15% of the total federal funds obligated for construction. Construction costs exclude costs of PE, right of way and CE. For implementation purposes, CE costs in excess of 15% on "State-Authorized" projects must be reviewed for reasonableness and approved by the Caltrans DLAE.

If Caltrans source inspection services will be requested, the local agency must submit/justify their request (refer to Exhibit 16-V "Source Inspection Request From Local Agency To Caltrans District Local Assistance Engineer," of the LAPM) at least 30 days prior to local agency submittal of their "Request for Authorization to Proceed with Construction." Caltrans may perform the requested source inspection services, subject to the availability of their inspectors (see "Source Inspection," Section 16.14, "Quality Assurance Program," of the LAPM).

Some ITS projects may be fully deployed without ever advancing to construction. There are other ITS projects with nonconstruction activities, which might be handled as consultant, low-bid, or service contracts (see Section 13.9, "Procurement/Construction," of the LAPG).

FTA TRANSFER PROCEDURES

Under ISTEA the transfer of FHWA funds to the FTA was accomplished via the Federal Authorization and Obligation Process (E-76). The transferred federal funds remained with FHWA (Washington D.C.) until the FTA submitted project invoices that were reimbursed by the FHWA.

The FHWA and FTA have since developed procedures that provide for the direct transfer of federal funds and Obligation Authority (OA) to the recipient federal agency. Caltrans submits a formal FTA transfer request to the FHWA (California Division) via a "Request for Transfer of Federal Funds to the FTA" letter (see Exhibit 3-J). Upon FHWA concurrence, the federal funds are transferred and deducted from the appropriate State and RTPA/MPO apportionment balances.

See Exhibit 3-K, "Administrative Procedures for Transfer of Local Federal-aid Funds to the Federal Transit Administration," for a step-by-step discussion of the transfer of FHWA apportioned local federal-aid funds to the FTA.

Federal-aid funds programmed in the STIP also may be transferred to the FTA. The DLAE and DLA are **not** involved in the transfer process (except for TE funds) instead, Caltrans DMT and the Office of Federal Resources within the Division of Budgets process the transfer of these funds.

Detailed procedures for Transfer of STIP to the FTA funds under the Section 5307, 5311, and 5310 Grant programs are available on the Caltrans DMT website at:

http://www.dot.ca.gov/hq/MassTrans/

Upon transfer of FHWA apportioned federal funds to the FTA, the Applicant Agency, typically will deal directly with the FTA on all subsequent project-related matters. However, occasionally a FTA transfer project may qualify to receive State Match Funds through the STIP. The project must be programmed to receive the STIP State Match Funds by an RTPA/MPO and be used, eligible activities under Article XIX of the California State Constitution.

Prior to reimbursement with STIP State funds: 1) the CTC must allocate the STIP match funds, 2) a Program Supplement Agreement (PSA) between the Applicant Agency and Caltrans must be signed and executed, 3) the Applicant Agency must prepare and sign a project specific Finance Letter, and 4) the Applicant Agency must provide evidence that payment of federal funds were invoiced/received from the FTA. Invoice format and procedures must adhere to Chapter 5, "Accounting/Invoices," of the LAPM.

3.11 MPO/RTPA PROGRAMMED FUND BALANCES

Under state law, certain federal funds are apportioned to the RTPA/MPO regions by formula. These funds include RSTP and CMAQ funds. These funds are programmed to local agencies for specific projects through the FTIP/FSTIP processes. Both Caltrans and the FHWA monitor the obligation and balance of federal funds. Caltrans maintains reports showing the obligation

of funds summarized at the District, MPO and county levels. These reports show fund balances and list the individual city and county projects. Please refer to the Division of Local Assistance Home Page for balances located at:

- http://www.dot.ca.gov/hq/LocalPrograms/Reports_db.htm

3.12 REFERENCES

- 23 CFR 635.301 et. seq. at: http://www.fhwa.dot.gov/legsregs/legislat.html
- 23 CFR 630.106
- 23 CFR 645
- 23 CFR 940
- USC 134(k)
- 49 USC, Section 5301, et. seq. (Federal Transit Laws)
- A Guide to Federal-Aid, Programs, Projects and Other Uses of Highway Funds, Federal Publication No. FHWA-IF-99-006, dated May 1999
- Federal-Aid Data System Instructions 06/06/02
- Federal Uniform Relocation Assistance and Real Property Acquisition Act
- Financing Federal-Aid Highways, Federal Publication No. FHWA-PL-99-015 dated August 1999.
- *Local Assistance Program Guidelines* (LAPG) Web site: http://www.dot.ca.gov/hq/LocalPrograms/public.htm
- Project Approval and Oversight Letter of Agreement (Stewardship Agreement) dated 12/26/2002
- SAFETEA-LU Web site: http://www.fhwa.dot.gov/safetealu/index.htm

EXHIBIT 3-A REQUEST FOR AUTHORIZATION TO PROCEED WITH PRELIMINARY ENGINEERING

(Local Agency Letterhead)

To: (DLAE Name)
District Local Assistance Engineer
Caltrans, Office of Local Assistance
(District Address)

Date: _____
FTIP/FSTIP ID: _____
Federal Project No: _____
EA: _____
PPNO (For STIP Projects): _____
High-Risk ITS (Phase 1 or 2): _____
Project Description: _____

Dear (DLAE Name):

In order to begin federally reimbursable preliminary engineering work for the above-referenced project, we request that you secure Federal Authorization to Proceed and Obligation of Funds. The federal funds requested will not exceed those provided to this agency in the federally approved Federal Transportation Improvement Program (FTIP)/Federal Statewide Transportation Improvement Program (FSTIP).

Attached are the following documents required to authorize this phase of work:

Request for Authorization Package

[ ] Completed Request for PE Authorization Data Sheet (Exhibit 3-E)
[ ] Copy of FTIP/FSTIP Reference
[ ] Completed Finance Letter (Exhibit 3-O)
[ ] For High-Risk (formerly "Major") ITS Projects – Phase 2 Only: FHWA approved Systems Engineering Management Plan (SEMP) (Note that federal approval of the SEMP is contingent on prior federal approval of the Systems Engineering Review Form [SERF])
[ ] Copy of Executed Cooperative Agreement (only for projects on State Highway System)
[ ] Request for Capital Subvention Reimbursement Allocation (Exhibit 3-H) (only for projects on State Highway System)

Field Review Form (Exhibit 7-B)

[ ] Completed Field Review Form (Exhibit 7-B), or
[ ] **A Field Review Form will be submitted within four (4) months of the Federal Authorization date, otherwise, it is understood the authorization to proceed will be canceled automatically. It is further understood that a Program Supplement Agreement will NOT be prepared until after the Field Review Form is submitted.**

Environmental Document

[ ] Type of NEPA Document. Approval Date: _____.
  [ ] Categorical Exclusion (CE) Form
  [ ] Findings of No Significant Impact (FONSI)
  [ ] Record of Decision (ROD)
  [ ] Re-evaluation

[ ] This agency has not completed the environmental process. The NEPA Document will be submitted at a later date, prior to beginning of final design (PS&E).

Disadvantaged Business Enterprise (DBE)

[ ] The Annual Anticipated DBE Participation Level (AADPL) for FFY _____was approved by Caltrans on_____.

[ ] All work for this phase of the project will be performed by local agency staff.

[ ] For consultant contracts an Underutilized Disadvantaged Business Enterprise (UDBE) goal will be established for each contract and the Local Agency Proposer UDBE Commitment (Consultant Contracts) (Exhibit 10-O1) will be submitted with the proposal. Within 15 days of contract execution, the Local Agency Proposer DBE Information (Consultant Contracts) (Exhibit 10-O2) shall be forwarded to the DLAE.

Pre-Award Audit

[ ] Completed Audit Disposition (Exhibit 10-K), or

[ ] Audit Disposition was not completed because neither federal-aid nor state funds will be used to fund a consultant contract, or

[ ] Pre-award audit was not performed because the consultant contract is for $250,000 or less and does not meet the criteria outlined in Exhibit 10-K requiring pre-award audit, or

[ ] Audit Disposition is not being submitted at this time. It will be submitted to the DLAE prior to entering a contract with the consultant(s).

California Transportation Commission (CTC) Allocation

[ ] A CTC allocation is not required, or

[ ] A CTC allocation of $ _____ (federal/state) funds for the PA/ED and/or PS&E component(s) of work was made at the _____ meeting of the CTC, or

[ ] A CTC allocation of funds has been scheduled for the _____ meeting of the CTC. It is understood that the authorization/obligation of any federal STIP funds will not be made until after the CTC allocation.

Project Agreement and Liquidation of Funds

Upon FHWA issuance of the "Authorization to Proceed" and Agency submittal of the "Field Review" form (Exhibit 7-B), a "Program Supplement Agreement" will be prepared to encumber the federal and/or state funds for the project. This Agency understands that any federal and/or state funds encumbered for the project are typically available for disbursement for a period of seven (7) and five (5) years respectively, from the beginning of the fiscal year(s) that those funds are appropriated in the State Budget Act, unless an extension is granted by the Department of Finance. It is anticipated that this phase of work will be completed by _____.

Invoice Submittal

This Agency understands that only relocation work performed after federal "Authorization to Proceed" (E-76) is eligible for reimbursement. Invoices for reimbursement will not be submitted until after the federal and state (if applicable) funds are encumbered via an executed "Program Supplement Agreement" and/or State approval Finance Letter. In addition, it is also understood that an invoice must be submitted at least once every six (6) months for each project phase until all funds are expended. If there are no eligible expenses, then a written explanation will be provided for that six (6) month period along with the target amount and date for the next invoice submittal.

CERTIFICATION

I certify that the facts and statements in this Request for Authorization Package are accurate and correct. This Agency agrees to comply with the applicable terms and conditions set forth in Title 23, U.S. Code, Highways, and the policies and procedures promulgated by the Federal Highway Administration and California Department of Transportation relative to the above-designated project.

I understand that this Agency is responsible for all costs in excess of the federal and/or state funds obligated / encumbered as well as for all costs it incurred prior to receiving the FHWA issued "Authorization to Proceed." I further understand that all subsequent phases of the project will require a separate "Federal Authorization to Proceed."

For high-risk and low-risk ITS projects, I understand that our project shall be consistent with the Regional ITS Architecture, adhere to ITS Standards, and undergo Systems Engineering analysis. A SERF will be included in the Field Review Package. For high-risk ITS projects, I understand that this Agency shall not proceed with component detailed design until after FHWA approval of the SEMP and receipt of "Authorization to Proceed."

Please advise us as soon as the "Federal Authorization to Proceed" has been issued. You may direct any questions to:

(Name of Local Agency Contact) at (phone number and e-mail address) .

Name

Title

Agency

Distribution: DLAE

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Indian Reservation: Indicate (Y/N) whether or not the project is located on an Indian Reservation.

Congressional Districts: Enter the congressional district(s) that are impacted by the project and the percentage of funds for each district.

Toll Road: Indicate (Y/N) if a toll road is involved. To monitor toll road projects or work performed on toll roads, enter a "Y."

Rural Area: Defines as an area having a population of less than 50,000.

Federal-Aid System: Indicate the federal-aid system on which the project is located. Valid entries are:

Interstate
NHS Non-Interstate
Other Federal-aid System
Not on Any Federal-aid System

Functional Classification: Streets and highways are grouped into classes or systems according to the character of service they provide. If there are multiple functional classifications involved, enter the higher classification. Valid entries for functional classification are:

Freeway and Expressway
Principal Arterial
Minor Arterial
Major Collector Minor Collector
Local
No Functional Class

State Highway: Indicate (Y/N), whether or not the project is located within the right of way limits of an existing **or** proposed state highway. If so, enter the State Highway Route number (e.g., I-405).

Administering Agency (Local or Caltrans): Indicate the name of the agency administering the project. If the project is located on a state highway and Caltrans is the project administrator, enter the name of the Caltrans Project Manager.

FHWA Oversight: Indicate whether or not this project may be "State-Authorized" or is subject to FHWA "Full-Oversight" (see Figure 2-1 FHWA Oversight, Chapter 2 of the LAPM). Projects that may be "State-Authorized" include: 1) all projects off the Interstate System, 2) all projects on Interstate System with an estimated construction cost less than $1,000,000, and 3) all Interstate 3R projects regardless of cost. Per current "Project Approval and Oversight Letters of Agreement between the Federal Highway Administration and the California Department of Transportation" certain types of projects, regardless of location and cost, may not be exempt from FHWA oversight. These include: 1) High-Risk (formerly "Major") ITS projects (as defined in Chapter 13 of the LAPG), 2) Major (non-ITS) projects receiving federal funds of $500 million or more, 3) Projects of National Significance under the Transportation Infrastructure Finance Innovation Act (TIFIA) of 1998, and 4) unusual bridges and structures. Oversight roles on these special categories of projects must be negotiated and agreed to by the FHWA, Caltrans, and project sponsor prior to submittal of the Request for Authorization to Proceed.

Advance Construction Authorization: Indicate (Y/N) whether or not an Advance Construction Authorization is being requested. If so, a local agency must submit a "Request for Advance Construction Authorization" form (see Exhibit 3-I).

100% Safety Eligible: Indicate (Y/N), whether or not this project is using 100% Safety funds in accordance with Title 23 of United States Code (U.S.C.) Section 120.

Cost Summary: Identify all project-related costs through the current request. The "TOTAL" cost of work is the sum of both the total federal participating and nonfederal participating project costs. The "federal participating" cost is equal to the cost of all work eligible for federal participation. Identify the "federal funding program and dollar amount" for each phase of work. Identify the funds previously obligated as well as these funds current request. The total federal funds obligated should not exceed the funds programmed in the federally approved FTIP/FSTIP (unless

prior approval is received from appropriate MPO/RTPA), Caltrans Administered Federal Program (such as Bridge, Safety) or allocated by the FHWA (discretionary/earmarked federal funds).

Finally, enter the "LOCAL" and/or other types of federal matching funds. Identify previous obligations and the current request for each phase of work. (If more space is needed, use a separate sheet of paper.)

Public Law, Section, and Legislated Project No: Identify the Public Law, Section and Legislated Project No. identifying to DEMO project.

Federal DEMO ID: This five (5) character alphanumeric identifier is required for all Demonstration (DEMO) funded projects. The first two characters are alpha (represent name of state) and the last three (3) characters are numeric (sequential number for the state), e.g., CA015, CA016.

The federal DEMO ID is assigned by the FHWA and relates to a specific DEMO project identified in public law. The DEMO ID is listed in the allocation memo to the FHWA Division office in Sacramento from the FHWA in Washington, D.C.

(DEMO) Estimated Construction Date: Enter the estimated start date (MM/YYYY) of physical construction for the DEMO project with its appurtenant facilities. This information must be reported for all DEMO funded projects. This includes any removal, adjustment or demolition of buildings or major obstructions, and utility or railroad work that is a part of the contract for physical construction.

Related DEMO Project(s): Occasionally, a DEMO funded transportation project is funded by multiple DEMO IDs. FHWA administrative procedures require that a separate federal project numbers be established for each DEMO ID to facilitate the tracking of federal funds on a DEMO ID basis. For projects funded with multiple DEMO IDs, cross-reference any directly related FPNs.

MPO/RTPA: Enter the name of the Metropolitan Planning Organization (MPO) or Regional Transportation Planning Agency (RTPA) within which the project is located.

Federal Funded Phases: Identify the project phases of work programmed to receive federal funds in the FTIP/FSTIP.

Federal Fund Types: Identify all fund types by federal or state program (e.g. STPL, CMAQ, HBP, STIP, etc.) and amounts programmed for the project.

FTIP/FSTIP/Year and No.: Enter the Federal Fiscal Year the FTIP/FSTIP was approved. For amendments to the FTIP/FSTP, enter the amendment number and approval date. Federal Fiscal Year 2003/2004 is identified as 03/04

Approval Date: Enter the date that the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) approved the FTIP or FSTIP (or amendment thereto) for the work being authorized. Enter the date in a MM/DD/YY (i.e., 10/05/02) format.

Approved Expedited Project Selection Procedures (EPSP): Indicate (Yes or No) whether or not Caltrans has approved the appropriate MPO/RTPA's EPSP.

Disadvantage Business Enterprise (DBE) Submittals: Enter the Caltrans Approval date of the California Department of Transportation DBE Implementation Agreement for Local Agencies (Exhibit 9-A). Enter the Caltrans Approval date for the current FFY Local Agency DBE Annual Submittal Form (Exhibit 9-B). The Local Agency must have a completed California Department of Transportation DBE Implementation Agreement for Local Agencies, and the current FFY Local Agency DBE Annual Submittal Form approved by Caltrans prior to the Agency's initial request for federal authorization. For this reason, the approval process for submitting the Local Agency DBE Annual Submittal Form should start well in advance of the planned date of first federal authorization. The approval date should be entered in a MM/DD/YY (i.e., 09/20/06) format.

Initial Federal Authorization Dates: Enter the federal authorization date for each phase of work as the project progresses through the project development process. This date represents the eligibility date for the start of federally reimbursable work. Federally reimbursable work may begin on the date that the FHWA (Sacramento) approves/authorizes (via electronic signature) the E-76. Work done prior to the FHWA authorization date shown on the E-76 will not be federally reimbursable.

EXHIBIT 3-G FEDERAL PROJECT LOG SHEET (MINIMUM REQUIREMENTS)

(For District use only)

TO: _____

AREA ENGINEER
Department Of Transportation
Division of Local Assistance - MS 1
1120 N Street, Sacramento, CA 95814

Mail:
P.O. Box 942874
Sacramento, CA 94274-0001

Dist., Cty, Rte, Agency:_____
Fed. Aid Project No: _____
E.A. Number: _____

Date: _____

From: _____

DLAE, District No. _____

Caltrans, Office of Local Assistance
_____
_____

	Prefix Chklst	FTIP/FSTIP Sht	FTA Grant App. *1	Field Rev. Form	Request for CSRA *2	Req. for Auth.	Req. for FTA Tran.	E-76	"SERF" ITS Projects	Finance Letter	Approved NEPA Document	Spec. Auth. Of Util. Est.	R/W Certification	PS&E Cert. & Chklst.	Preliminary Engineering Estimate	Cont. Award Chklst.	Detail Estimate	Approved DBE Submittals	R.O.E. *3	Date (HQ use only)
PRELIM. ENG.																				
Authorization	☐	☐		1	☐	☐		☐	⬚	☐	5							3		
Program Suppl't				☐						⬚										
Cost Adjustment		⬚						☐		☐										
R/W																				
Authorization	⬚			☐	⬚	☐		☐		☐	☐	4						3		
Cost Adjustment		⬚						☐		☐										
CONST & CE																				
Authorization	⬚			☐	⬚	☐		☐		☐	⬚		☐	☐	☐			3		
Award Package*4										☐						☐	☐	☐		
Cost Adjustment		⬚						☐		☐							☐			
FTA TRANSFER		☐	☐				☐			2										
PROJECT COMPLETION																			☐	

Legend:

- ☐ = Required Document
- ⬚ =Required if not submitted previously or have significant change since
- 1 =The first two-sheets of field review form
- 2 = Only req'd if there are STIP Match $ (Not often)
- 3 = Required prior for first authorization of FFY
- 4 = Required for Fed. Part. Util. Reloc.
- 5 = Required for Final Design

*1 FTA Grant Appl'n = Copy of grant appl'n funding info. For agencies using Sect. 5307 & 5336 procedures
*2 Request for Subvention Reimbursement Allocation - ONLY required for State Highway System projects
*3 Report of Expenditures; see Chapter 17, Project Completion, Local Assistance Procedure Manual
*4 Award Package, see Chapter 15, "Advertise & Award Project", LAPM

Updated 04/30/10

Distribution: DLAE Use

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CHAPTER 7 FIELD REVIEW

7.1 INTRODUCTION

In conjunction with the preliminary environmental investigation, an important early action in developing a local transportation project financed with federal-aid funds is the methodical and systematic collection of initial engineering and related project data and information. For this manual, this data gathering project-scoping step is called the "Field Review."

Each agency should establish a process for clearly defining the location, scope, cost, and the other parameters considered when developing a project. This step is very important in guiding the project development team to the successful production of the Plans, Specifications and Estimate (PS&E).

The field review for local agency transportation projects off the State Highway System (SHS) serves the same purpose as the Project Study Report serves for state highway projects. It is intended to bring together all interested parties and come to an agreement on the project requirements necessary to comply with federal and state laws and regulations. For local agency projects on the SHS, consult the Caltrans *Project Development Procedures Manual (*http://www.dot.ca.gov/hq/oppd/pdpm/pdpmn.htm), the District Local Assistance Engineer (DLAE), and the project manager to coordinate development responsibilities.

The field review process considers and documents the following actions:

- Assigns a local agency project manager to oversee the project studies, PS&E development and/or construction.
- Brings together representatives from various involved or interested agencies, including, but not limited to, the agency, Caltrans, other regional and local agencies, transit districts, other state or federal permitting agencies, public utilities, and railroads. FHWA may also be represented.
- Affords an opportunity for discussions of alternative proposals.
- Secures agreement on general design features and exceptions to American Association of State Highway and Transportation Officials (AASHTO) standards, or 3R,or local standards selected for the project.
- Identifies pedestrian facilities within the project area that will or may need to be brought up to current federal, state and/or local standards to be Americans with Disabilities Act (ADA) compliant.
- Determines if the project is a federal-aid Intelligent Transportation Systems (ITS) project. If so, determines if it is a High-Risk (formerly "Major"), Low-Risk (formerly "Minor") or Exempt ITS project.
- Determines timing and costs associated with preparing and processing required technical studies and the NEPA document (see "Environmental Procedures" included in Chapter 6, "Environmental Procedures," of the *Local Assistance Procedures Manual* (LAPM) and Caltrans *Standard Environmental Reference* [SER] at this web site: http://www.dot.ca.gov/ser/vol1/vol1.htm).

- Determines right of way and relocation assistance requirements.
- Discusses and evaluates proposed funding, eligibility requirements, and federal or state participation.
- Determines who advertises, awards, administers (AAA), and maintains the proposed project.
- Defines the project schedule and target advertising date.
- Discusses value engineering analysis, for each federal-aid project on the federal-aid system with an estimated total cost of $25 million or more and bridge projects with an estimated total cost of $20 million or more. For more information on this subject, please see Chapter 12 "Plans, Specifications & Estimate," Section 12.5 "Value Engineering Analysis," of the LAPM.

7.2 TYPE AND REQUIREMENT FOR FIELD REVIEW

The type of field review chosen for a project depends on many factors including: highway system, project type (State-Authorized or FHWA Full Oversight on Interstate projects), project complexity, total cost, and type of funds. The two types of field reviews are formal and informal.

EXHIBIT 7-B FIELD REVIEW FORM

Local Agency _____ Field Review Date _____
Project Number _____ Locator _____
(Dst/Co/Rte/PM/Agncy)
Project Name _____ Bridge No.(s) _____

1. PROJECT LIMITS (see attached list for various locations) _____
_____
_____ Net Length _____ (mile)
2. WORK DESCRIPTION _____
_____
ITS project or ITS element: Yes ____ No ____
If yes, choose: High-Risk (formerly "Major") ITS ___, Low-Risk (formerly "Minor") ITS ___, Exempt ITS ___
3. PROGRAMMING DATA FTIP (MPO/RTPA) _____ FY _____ Page ____
Amendment No. _____ FTIP PPNO _____ FHWA/FTA Approval Date _____
Federal Funds $_____ Phases PE _____ R/W _____ Const ____
Air Basin: _____ (CMAQ only)
4. FUNCTIONAL CLASSIFICATION:

URBAN _____
Principal Arterial: _____
Minor Arterial: _____
Collector: _____
Local: _____

RURAL _____
Principal Arterial: _____
Minor Arterial: _____
Major Collector: _____
Minor Collector: _____
Rural Local: _____

5. STEWARDSHIP CATEGORY
FHWA Full Oversight (Stewardship): Yes ___ No ___
State-Authorized(Stewardship): Yes ___ No ___ (a) DLAE oversight: Yes ___ No ___
(b) District Construction Oversight: Yes ___ No ___
ITS High-Risk project or element requiring FHWA oversight per stewardship: Yes ___ No ___
6. CALTRANS ENCROACHMENT PERMIT Is it required? Yes _____ No _____
7. COST ESTIMATE BREAKDOWN $1,000's Fed. Participation
(Including Structures)

PE	Environmental Process	_____	Yes	____	No	____
	Design	_____	Yes	____	No	____
	ITS System Manager or Integrator	_____	Yes	____	No	____
CONST	Const. Contract	_____	Yes	____	No	____
	Const. Engineering	_____	Yes	____	No	____
R/W	Preliminary R/W Work	_____	Yes	____	No	____
	Acquisition:		Yes	____	No	____
	(No. of Parcels ____)	_____	Yes	____	No	____
	(Easements ____)	_____	Yes	____	No	____
	(Right of Entry ____)	_____	Yes	____	No	____
	RAP (No. Families)	_____	Yes	____	No	____
	RAP (No. Bus. ____)	_____	Yes	____	No	____
	Utilities (Exclude if included in contract items)	_____	Yes	____	No	____

_____
TOTAL COST $ _____

7a. Value Engineering Analysis Required? Yes _____ No _____
(Yes, if total project costs are $25M or more on the Federal-aid System, or $20M or more for bridges)

8. PROPOSED FUNDING

		Total Cost		Cost Share		
Grand Total		$ _____				
Federal Program	#1_____	$ _____	Fed.	$ _____	Reimb. Ratio	_____
(Name/App. Code)	#2_____	$ _____	Fed.	$ _____	Reimb. Ratio	_____
Matching Funds Breakdown	Local:			$ _____	_____%	
	State:			$ _____	_____%	
	Other:			$ _____	_____%	

State Highway Funds? Yes _____ Source _____ No _____
State CMAQ/RSTP Match Eligible Yes _____ No _____ Partial _____
Is the Project Underfunded? (Fed $ < Allowed Reimb.) Yes _____ No _____

9. PROJECT ADMINISTRATION

		Agency	Consultant	State
PE	Environ Process	_____	_____	_____
	Design	_____	_____	_____
	System Man./Integ. ____	_____	_____	_____
R/W	All Work	_____	_____	_____
CONST ENGR	Contract	_____	_____	_____
CONSTRUCTION	Contract	_____	_____	_____
MAINTENANCE		_____		_____

Will Caltrans be requested to review PS&E? Yes _____ No _____

10. SCHEDULES: PROPOSED ADVERTISEMENT DATE _____
Other critical dates: _____
_____

11. PROJECT MANAGER'S CONCURRENCE

Local Entity _____ Date: _____

Signature & Title _____ Phone No. _____

Is field review required? Yes _____ No _____

Caltrans (District): _____ Date: _____

Signature & Title: _____

12. LIST OF ATTACHMENTS (Include all appropriate attachments if field review is required. See the "[ ]" notation for minimum required attachments for non-NHS projects)

_____ Field Review Attendance Roster or Contacts Roster
_____ Vicinity Map (Required for Construction Type Projects)

IF APPLICABLE (Complete as required depending on type of work involved)

_____ Roadway Data Sheets [Req'd for Roadway projects]
_____ Typical Roadway Geometric Section(s) [Req'd for Roadway projects]
_____ Major Structure Data Sheet [Req'd for HBRR]
_____ Railroad Grade Crossing Data Sheet
_____ Signal Warrants
_____ Collision Diagram

_____ Airport Data Sheet (if within 10,000 feet)
_____ Sketch of Each Proposed Alternate Improvement
_____ TE Application Document
_____ Existing federal, state, and local ADA deficiencies not included on other Attachments
_____ CMAQ/RSTP State STIP Match
_____ Systems Engineering Review Form (SERF) Req'd for High-Risk (formerly "Major") and Low-Risk (formerly "Minor") ITS projects

13. DLAE FIELD REVIEW NOTES:

A. MINUTES OF FIELD REVIEWS

B. ISSUES OR UNUSUAL ASPECTS OF PROJECT

(Attachment to Field Review Form)

Distribution: Original with attachments – Local Agency
Copy with attachments (2 copies if HBRR) - DLAE

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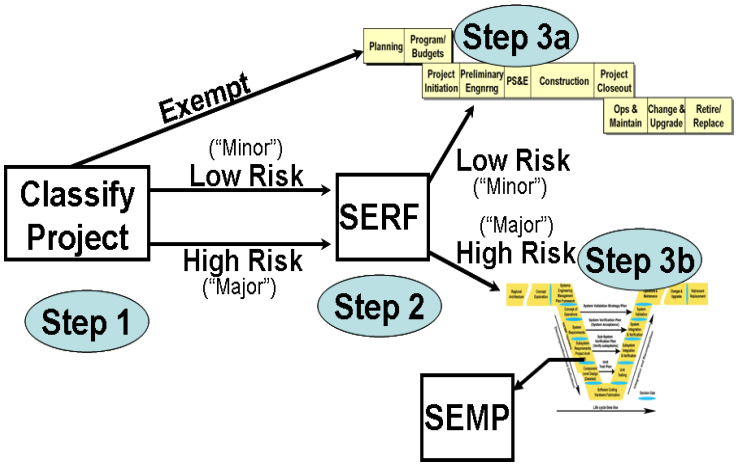
SYSTEMS ENGINEERING REVIEW FORM (SERF)

Part 1. General Project Information

The SERF is normally submitted as part of the E-76 package when initial funding is requested. A full description of funding steps for ITS projects appears in Section 13.1 of the LAPG. The SERF must be filled out for **all** ITS projects unless they are "**Exempt**." For definitions of an Exempt ITS project, see LAPG Section 13.2. A full discussion of how a local agency uses the SERF during the programming and funding steps is in LAPG Section 13.4, in the section titled "Local agency (include consultants in project management role)". That process is summarized in the figure at the right.



Please provide the following background information. In most cases, 1-3 sentences will be sufficient for each item, but you may include as much as you feel needed. If you need more space, the field will expand automatically.

A. Project Contact – Name, position, phone, email.

B. Project Objectives – What is the purpose of the project? What needs (deficiencies) are being addressed?

C. Project Summary – What solutions will address the needs? What major elements will be installed? What major function(s) will be performed?

D. Work to Date – Any preliminary planning, investigation of options, associated internal or external systems examined, etc.?

E. Risk Assessment Guidance – Although this assessment is not a regulatory requirement, the answers to these questions will help you understand the extent of risk involved in this project. A full discussion of risk factors is available in LAPG Section 13.2, with a summary in Table 13-1.
For each question, check Yes or No or Not Sure.

Question:	Yes	No	Not Sure
1. Will the project depend on ***only your agency*** to implement and operate?	☐	☐	☐
2. Will the project use only software proven elsewhere, with ***no*** new software writing?	☐	☐	☐
3. Will the project use only hardware and communications ***proven*** elsewhere?	☐	☐	☐
4. Will the project use only ***existing interfaces*** (no new interfaces to other systems)?	☐	☐	☐
5. Will the project use only ***existing system requirements*** that are defined in writing?	☐	☐	☐
6. Will the project use only ***existing operating procedures*** that are defined in writing?	☐	☐	☐
7. Will the project use only technologies with service life ***longer*** than 2-4 years?	☐	☐	☐

If all of the above are Yes, that is a preliminary indication that your project is **Low-Risk**.

Part 2. Regulatory Compliance Information

Please answer each question briefly (often one paragraph is enough). If the question cannot be fully answered *now*, but will be answered during the project implementation, please indicate the step at which it will be answered. As you respond to each question on this form, the field will expand as you type. Examples of SERF's can be found at: http://www.fhwa.dot.gov/cadiv/segb/examples/del.htm (then click on "FHWA Rule/FTA Policy Compliance Documents").

1. **Identification of portions of the Regional ITS Architecture (RA) being implemented:**

Instructions: Contact your MPO to get this information from your Regional ITS Architecture ("RA"). In the RA, the project might be identified specifically by name and agency, or by a more generic description (e.g. "Arterial Traffic Management"). If listed in the RA, document which inventory elements, market packages, subsystems, and/or information flows are being completed in this project. If there is ***no*** *information in your RA, arrange with your MPO to provide them this information when your project is designed; they will use it in the next update of the RA.*
Please enter your response here (the field will expand as you type):

2. **Identification of participating agencies roles and responsibilities:**

Instructions: Can you identify all stakeholders that must participate in the implementation phase of this project? What are their roles/responsibilities? Have they committed to the responsibilities? Some of this information might appear in your RA (e.g., "Operational Concepts" or other sections). If this will be defined in later phase of the project (e.g., Concept of Operations), the RA may be a good source to start definition.
Please enter your response here (the field will expand as you type):

3. **Procedures and resources necessary for operations and management of the system:**

Instructions: Can you identify all stakeholders that must participate in operations, management and maintenance of the system throughout its life cycle? What are the roles, responsibilities, and resources required from each stakeholder? Examples include: money, special equipment, staff time, special expertise, provision of data, and many more. You should consider hardware, software, and communications issues.
Please enter your response here (the field will expand as you type):

4. **Requirements definitions:**

Instructions: Are the system requirements (functional and performance) already well-defined ***in writing****?*
*If yes, indicate where they can be found (e.g., Std. Specs). If they will be defined in later phase of the project, the applicable high-level functional requirements in the RA may be a good starting point for writing them. The focus is on "****what****" functions must be performed – ****not*** *on "****how****" the technology will be used to perform them.*
Please enter your response here (the field will expand as you type):

5. **Identification of applicable ITS standards and testing procedures:**

Instructions: Do you know yet if any ITS Communications Standards are applicable to this project? If they are applicable, will you use them? If your RA identifies specific Architecture Flows, you can ask your MPO to produce a "Standards Report" for those Flows; it will identify ITS Standards to consider.
Please enter your response here (the field will expand as you type):

6. **Analysis of alternative system configurations and technology options to meet requirements:**

Instructions: Have you considered alternative designs yet? This could include system configurations, different organizational roles; alternative hardware, software, or communications technology; If you can not yet make a choice of available alternatives, this analysis will occur in later phase of the project (High-Level Design).
Please enter your response here (the field will expand as you type):

7. **Procurement options:**

Instructions: Have you considered different procurement options for each of the project phases (design, implementation, operation, and management)? These options could include: off-the-shelf vs. custom, lease vs. buy, fixed-price vs. cost-reimbursable, etc. Procurement options must consider the level of staff technical expertise, existing agency procurement practices, who will be the project manager, and whether you need a systems engineer and/or system integrator.
Please enter your response here (the field will expand as you type):

Comments or Additional Information (if needed):

Note: If you were able to answer all seven questions above completely and with certainty, then please self-certify this project as "Low-Risk" in the E-76. Otherwise, it should be classified as "High-Risk." However, if you feel this is not justified, you may request a review of this SERF by Caltrans and FHWA.

Intelligent Transportation Systems/Traffic Signal Controllers

Per 23 Code of Federal Regulations (CFR), Part 940, *Intelligent Transportation System Architecture and Standards*, effective April 8, 2001, all Intelligent Transportation Systems (ITS) projects must adhere to ITS Standards. The choice of ITS Standards hinges on the development of a Regional ITS Architecture (RA). See Chapter 13 "*Intelligent Transportation Systems (ITS) Program*", of the LAPG for details on ITS Standards, or website at: http://www.dot.ca.gov/hq/LocalPrograms/lam/prog_g/g13its.pdf

Assembly Bill 3418 (1995) which amended Section 21401 of the *California Vehicle Code*, requires "any traffic signal controller that is newly installed or upgraded by the Department of Transportation or a local authority after January 1, 1996, shall be of a standard traffic signal communication protocol capable of two-way communications." Communication standards for traffic signal controllers are available from the National Transportation Communications for ITS Protocol. This information may be accessed through the Internet at: http://www.ntcip.org/. Other ITS elements to enhance pedestrian safety at intersections can be found at: http://www.walkinginfo.org/pedsmart/home.htm

Safety

The following publications have also been developed to aid the designer in improving highway safety:

- *Manual on Uniform Traffic Control Devices* (MUTCD)
- *MUTCD California Supplement*
- *Designing Safer Roads, Special Report 214*, Transportation Research Board
- *Roadside Design Guide, 1995* (availalble through AASHTO)

These publications are primarily informational or guidance in nature, and serve to assist local agencies in knowing the information valuable to attaining good designs. All designers should be familiar with these documents. Although the principles contained are written primarily for high-speed highway facilities, consideration should be given to their application on other types of projects regardless of traffic volumes and design speed. Project-by-project deviations from the criteria in these publications do not require handling in accordance with design exception approval procedures cited in Section 11.4 of this chapter. However, any deviations should be justified and documented in the project files.

Evaluating accident records is an integral step in developing highway projects and often reveals problems requiring special attention and corrective action. Accident records are available from the Statewide Integrated Traffic Records System (SWITRS) for analysis. Relative accident rates can influence the priorities of projects and ensure that project objectives and the scope of design are related to accident causes. In addition, it may be necessary to use a cost/benefit study and an investigation of accident experience, to determine, if the correction of an identified safety problem is cost-effective. Significant safety problems, such as narrow bridges or culverts, railroad crossings or fixed objects which are not cost-effective to correct, must be provided with suitable warning and traffic control devices. For example, no bridges may be left in place which have a width narrower than the surfaced approach roadway, unless suitable signing, marking and parapet protection are provided.

On many local agency projects, right of way considerations may limit the extent to which side slopes may be flattened and roadside clearances obtained. In such situations, it is expected that the desired smooth and obstacle-free roadside will be obtained to the extent feasible.

Bikeway Standards

The standards for bikeway projects shall conform to Chapter 1000 of the *Caltrans Highway Design Manual*. Deviations from the "mandatory" bikeway standards stated therein require approval in accordance with the design exception approval procedures described in Section 11.4 of this chapter.

Pedestrian Facilities

General Policy

Caltrans has the responsibility to ensure that all local agency projects, for which the local agency receives federal financial assistance from the US Department of Transportation, fully comply with 49 CFR (Code of Federal Regulations), Part 27 entitled, *Nondiscrimination on the Basis of Disability in Programs and Activities receiving or Benefiting from Federal Financial Assistance*. 49 CFR, Part 27 applies to each recipient of federal assistance from the US Department of Transportation, and to each program or activity that receives or benefits from such assistance.

Specifically, Caltrans' role is to ensure that all new and existing altered facilities such as, but not limited to highway rest area facilities, sidewalks, pedestrian cross walks, pedestrian over-passes, under-passes and ramps shall be made accessible to disabled persons in accordance with federal and state (the state should provide equal or greater accessibility) standards on all local agency federal-aid projects meeting the criteria for the ADA compliance as explained below.

In addition, local agencies are encouraged to adopt appropriate policies of the FHWA and Caltrans, e.g., *Accommodating Bicycle Pedestrian Travel*: *A Recommended Approach*, and Deputy Directive 64, *Accommodating Non-Motorized Travel*. This will help assure that the needs of non-motorized travelers are met in all programming, planning, construction, maintenance, operations, and project development activities and products.

Accessibility

Title II of the ADA of 1990 (http://www.usdoj.gov/crt/ada/reg2.html) prohibits discrimination on the basis of disability by public entities. This means that a public entity may not deny the benefits of its programs, activities, and services to individuals with disabilities because its facilities are inaccessible to these individuals. A public entity's services, programs, or activities when viewed in their entirety, must be readily accessible to, and usable by individuals with disabilities. This general requirement known as "program accessibility" applies to all existing facilities of a public entity. Under Title III (http://www.usdoj.gov/crt/ada/reg3a.html), public entities are not required to make each of their existing facilities accessible; as long as persons with disabilities have "equal access" to the goods and services provided to persons without disabilities.