



## *Local Programs Procedures*

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**LPP 01-10 Manual Update**  
**Subjects: Metrication in Documents for Projects**  
**Off the State Highway System**

Reference: *Local Assistance Procedures Manual* (LAPM), Chapter 12, “Plans, Specifications, and Estimate”

LPP 99-07, “Project Labor Agreements/Metrication/Optional Contract Provisions”

Effective Date: December 5, 2001

Approved: \_\_\_\_\_  
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### **User-Friendly Features:**

- The procedural changes set forth in this Local Programs Procedure (LPP) are incorporated into the text of *Local Assistance Procedures Manual* (LAPM) Chapter 12. Affected pages (new and/or revised) are included as attachments to this LPP and can be easily inserted into existing hard copies of the LAPM.
- Vertical lines located in the outside margin clearly show the location of revisions and additions on each page.
- For quick reference, the LPP number of the most recent LPP to affect the content of a page appears in the footnote area.
- A list of references is provided in this LPP.

The most current, electronic version of the LAPM, and all of its chapters, can be viewed or downloaded from the Division of Local Assistance website at:

<http://www.dot.ca.gov/hq/LocalPrograms/lam/lapm.htm>.

### **PURPOSE**

The purpose of this LPP is to revise LAPM Chapter 12, “Plans, Specifications, and Estimates” (PS&Es), Section 12.6, regarding the use of metric units in environmental, right of way, and other documents for projects off the State Highway System.

### **BACKGROUND**

The National Highway System Designation Act of 1995, Section 205(c)(2) prohibited FHWA from requiring any state to use the metric system "...with respect to designing or advertising, or preparing plans, specifications, estimates, *or other documents* for a Federal-aid highway project eligible for assistance under title 23, United States Code before *September 30, 2000.*"

The Transportation Equity Act for the 21<sup>st</sup> Century (Section 1211[d]) rescinded the date of September 30, 2000, making the exception permanent.

On June 1, 2001, FHWA's Chief Counsel determined that "not only environmental documents but all reports and documents" are covered under "*other documents.*"

Based on this determination, local agency-prepared plans, specifications, estimates, and other documents (including environmental and right of way documents) for federal-aid projects off the State Highway System may be developed in either English or metric units.

### **METRICATION**

#### EXISTING PROCEDURE

**For projects on the State Highway System, all local agency project PS&Es (even those using local funds) must be in metric units.** Although Caltrans encourages local agencies to proceed with their conversion to metric units, either English or metric units may be used for local federal-aid projects off the State Highway System. Both units must be used in any environmental document.

#### NEW PROCEDURE

PS&E for all projects on the State Highway System (including those administered by local agencies) must be in metric units.

Although Caltrans encourages local agencies to proceed with their conversion to metric units, local agency project PS&E and other documents (*including environmental and right of way*), for local federal-aid projects off the State Highway System, may be developed in either English, metric or both. For public convenience, environmental and other documents that have been prepared in metric units and are intended for public consumption should also include the English equivalent.

### **REFERENCES**

- FHWA memorandum, dated June 1, 2001, from HIPA, Deputy Executive Director to Division Administrators and Federal Lands Highway Division Engineers
- Caltrans letter, dated August 28, 1998, from Design and Local Programs to All California Transportation Officials

Under Caltrans' delegation authority, the responsibility of assuring that VE analysis has been performed shall be delegated to the local agency administering their project.

## DEFINITIONS

Project - A portion of a highway that a local agency proposes to construct, reconstruct, or improve as described in the preliminary design report or applicable environmental document. A project may consist of several contracts or phases over several years.

Value Engineering - The systematic application of recognized techniques by a multi-disciplined team to identify the function of a product or service, establish a worth for that function, generate alternatives through the use of creative thinking, and provide the needed functions to accomplish the original purpose of the project, reliably, and at the lowest life-cycle cost without sacrificing safety, necessary quality, and environmental attributes of the project.

## PROCEDURES

Local agencies must establish programs to assure that VE studies are performed on all federal-aid highway projects on the NHS with an estimated cost of \$25 million or more. This cost is the total cost of the project, from preliminary engineering through construction. Value engineering studies shall follow the widely recognized systematic problem-solving analysis process that is used throughout private industry and governmental agencies. Studies must be performed using multi-disciplined teams of individuals not personally involved in the design of the project. Study teams should consist of a team leader and individuals from different specialty areas, such as design, construction, environmental, planning, maintenance, right of way, and other areas depending upon the type of project being reviewed. Individuals from the public and other agencies may also be included on the team when their inclusion is found to be in the public interest.

For VE Studies of projects on the State Highway System, it is advisable to leave Caltrans' participation on the VE team.

This process concludes with a value analysis report that contains the approved recommendations. A copy of this report shall be forwarded to the District Value Analysis Coordinator (DVAC) in the district that is programming the project. The DVAC will submit this report to the value analysis branch in headquarters, who will then include it in their annual report to FHWA.

As a guide, Chapter 19 "Value Analysis" of the *Project Development Procedures Manual* may be used. The DVAC should be consulted for applicable sections.

## 12.6 METRICATION

### IMPLEMENTATION

The 1991 Intermodal Surface Transportation Efficiency Act (ISTEA) mandated that all PS&Es for federal-aid construction projects use metric units after September 30, 1996.

However, the National Highway System Designation Act of 1995, signed by the President on November 28, 1995, eliminated the metric requirement. Caltrans has implemented the conversion to metric units for all projects on the State Highway System. Caltrans design manuals, standard plans, and standard specifications have been converted to metric units. As of July 1, 1998, Caltrans stopped maintaining these documents in English units. Because Caltrans documents are no longer maintained in English units, past English versions of these documents cannot be referenced as part of an official construction contract unless:

1. The responsible charge engineer has determined that revisions or additions have not been made to the current metric version; or,
2. The responsible charge engineer has developed and incorporated an English units version of the new or revised Caltrans Standard Specifications and Plans, and Special Provisions into the contract documents.

Once the determination to use English units has been made, it should be noted in the project file.

PS&E for all projects on the State Highway System (including those administered by local agencies) must be in metric units.

Although Caltrans encourages local agencies to proceed with their conversion to metric units, local agency project PS&E and other documents (including environmental and right of way), for local federal-aid projects off the State Highway System, may be developed in either English, metric or both. For public convenience, environmental and other documents that have been prepared in metric units and are intended for public consumption should also include the English equivalent.

During the continuing effort to transition to metric units, either English or metric units may be used when the local agency, or their consultant, prepares the final PS&E package for bridge retrofit projects. On the other hand, English units must be used when Caltrans consultants prepare the final PS&E package for seismic retrofit design. Regardless of the units used, both the bridge and roadway units must be the same (see Chapter 7, "Seismic Safety Retrofit Program," of the *Local Assistance Program Guidelines*).

## CONVERSION TO METRIC UNITS

There are two ways to convert from English to metric units:

- "Soft" conversion -- a direct mathematical conversion to an exact or nearly exact metric equivalent; for example: a 12 foot lane can be "soft converted" to 3.658 meters.
- "Hard" conversion -- a rounded, rationalized, metric number that is convenient to work with and easy to remember; for example: the new metric standard lane width (see Chapter 300 of the Caltrans *Highway Design Manual*, 5th edition) is 3.6 meters.

The "hard" conversion approach to metric units has effectively resulted in many new "metric standards."

The Institute of Transportation Studies - University of California Berkeley (ITS), through the Cooperative Training Assistance Program (CTAP) and the Local Technical Assistance Program (LTAP), offers training courses in understanding metric conversion for local agencies. Also available through ITS are: AASHTO's *Guide to Metric Conversion*, Caltrans' booklet entitled *Getting into Metrics*, and CD-ROM metric training packages.

## 12.7 PLANS

Project plans shall describe the location, design features, and construction requirements in sufficient detail to facilitate the construction, contract control and estimation of construction costs for the project.

A local agency may use the Caltrans *Drafting and Plans Manual* as a guide for preparing

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