

PREFACE

Caltrans utilizes Life-Cycle Cost Analysis (LCCA) to study the pavement investment alternative on the state highway projects in California. LCCA is an analytical technique that uses engineering economic principles to evaluate long-term investment options. The analysis enables total cost comparison of competing pavement alternatives with equivalent benefits. LCCA accounts for relevant costs to the sponsoring agency, owner, operator of the facility, and the roadway user that will occur throughout the analysis period of alternatives.

It is Caltrans' policy that life-cycle cost impacts are fully taken into account when making project-level decisions for pavements. Beginning in 2007, a LCCA is required for all pavement projects that are done on the State Highway System, regardless of funding source, with the exceptions of HM-1, Minor A and Minor B, encroachment permit, maintenance pullout, and landscaping projects. In 2013, CAPM projects no longer require LCCA.

Caltrans uses life-cycle cost analysis software, which is called *RealCost*. *RealCost* is a program developed by the Federal Highway Administration (FHWA) and was chosen by Caltrans as the official software for evaluating the long term cost effectiveness of alternative designs for new and existing pavements. The first version that was used by Caltrans was *RealCost 2.2CA* starting in 2007. In 2013, Caltrans developed a newer version of *RealCost Version 2.5CA*, which is a modified version of FHWA *RealCost Version 2.5* to include many improved features.

Caltrans has developed Life-Cycle Cost Analysis Procedure Manual to provide LCCA procedures and step-by-step instructions on how to use *RealCost*. Caltrans revises the manual periodically due to changes in policy, procedures, data and software. The purpose of the revisions is to save engineers' time and improve the accuracy and consistency of the analysis.

The most recent version of LCCA Procedures Manual and *RealCost* software program shall be used to ensure proper reference to current LCCA policies, data, procedures, and guidance.

The contents of this manual are organized as follows:

Chapter 1 is an introductory chapter, which goes over the basic concepts of LCCA, including policies and applications of LCCA within Caltrans and the benefits of using LCCA. The policy changes include elimination of the required LCCA on CAPM projects.

Chapter 2 outlines the principles and procedures of LCCA including new processes to select pavement alternatives.

Chapter 3 discusses LCCA methodology in detail, along with *RealCost Version 2.5CA* installation and detailed step by step instructions.

Chapter 4 gives insight on analyzing the LCCA results, and some of the limitation involved with using LCCA. There are discussions on comparing results for choosing the most cost effective pavement alternative.

There are also eight appendices, which include various tables and references.

Additional information including LCCA examples and HQ LCCA Coordinator contact information can be found at the LCCA website:

http://www.dot.ca.gov/hq/maint/Pavement/Offices/Pavement_Engineering/LCCA_index.html

Questions regarding LCCA may be directed to the HQ LCCA Coordinator.