

Pavement

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Project Title:

Partnered Pavement Research Center (PPRC) 23: Pavement Management System

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Updates and Improvements to Web-Based RealCost-CA

Updating the California Department of Transportation's (Caltrans) Life Cycle Cost Analysis procedure manual and enhancing the RealCost-CA tool.

WHAT IS THE NEED?

Since 2007, Life Cycle Cost Analysis (LCCA) has been required for all major pavement projects on the State Highway System, including new construction, reconstruction, and rehabilitation. Originally developed by the Federal Highway Administration (FHWA), LCCA has been continuously adapted by Caltrans for California's specific needs. The University of California Pavement Research Center (UCPRC) developed customized versions of the RealCost-CA software in 2007, 2013, and 2023. Regular updates to both the procedure manual and software are essential to keep pace with current policies, guidelines, and engineering practices.

WHAT ARE WE DOING?

This task focuses on updating Caltrans' LCCA procedure manual and enhancing the RealCost-CA tool by addressing four key areas:

- Integrating construction cost data into a centralized, regularly updated database compatible with Caltrans' pavement design and management tools, including California Mechanistic-Empirical (CalME), PavementME, Pavem, Environmental Life Cycle Assessment for Pavements (eLCAP), and RealCost-CA.
- Updating LCCA methodologies to reflect new empirical and mechanistic-empirical pavement performance models, ensuring alignment with revised decision trees and maintenance and rehabilitation (M&R) schedules for both asphalt and concrete pavements.
- Revising procedures to incorporate emerging strategies, materials, processes, and treatments in line with the latest Highway Design Manual (HDM) updates.



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- Documenting all improvements in updated manuals and technical memoranda for use by Caltrans engineers and decision-makers.

UCPRC continues to host, support, and maintain the RealCost-CA platform.

WHAT IS OUR GOAL?

The primary goal is to update Caltrans' LCCA procedure manual and enhance the RealCost-CA tool, helping engineers select the most cost-effective pavement alternatives for state highway projects. This ensures consistency, accuracy, and alignment with current standards and best practices.

WHAT IS THE BENEFIT?

Continuous updates to the LCCA methodology and RealCost-CA tool improve Caltrans' ability to make informed, data-driven decisions about pavement alternatives. This enhances cost-effectiveness, extends pavement service life, reduces maintenance needs, and improves overall project outcomes. The updated tool also ensures that pavement investment decisions are consistent with the latest policies, sustainability goals, and engineering models.

WHAT IS THE PROGRESS TO DATE?

The research team has made the following progress:

- Construction cost data collection and validation are in progress; construction cost information for the LCCA Procedure Manual and RealCost-CA has been finalized, discount rates updated, and pavement treatment costs validated.
- Conversion of RealCost-CA 3.0 to the React framework is underway; programming continues, and Maintenance and Rehabilitation (M&R) tables for multiple pavement types have been finalized. A live demonstration of agency cost calculation in RealCost-CA 3.0 was provided.
- Continued evaluation of new construction, maintenance, and rehabilitation strategies and

development of multi-criteria decision analysis guidance, including initial case examples.

- Preparation of updates to the LCCA Procedure Manual and technical memorandum is progressing.