

DRISI

CALTRANS DIVISION OF RESEARCH,
INNOVATION AND SYSTEM INFORMATION

Research Notes

Sustainability

MAY 2024

Project Title:
Partnered Pavement Research
Center (PPRC) 23: Sustainability

Task Number: 4207

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2026

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Sustainability: Pavement Life Cycle Assessment (LCA)

Updating the database and implementing new models for LCA.

WHAT IS THE NEED?

Over the last decade, the University of California Pavement Research Center (UCPRC) collaborated with Caltrans on multiple projects to gather data on pavement materials, construction methods, and energy sources. These data were used to develop a web based LCA tool called eLCAP. Regular updates to database are crucial for conducting effective LCAs to support decision-making in project design, pavement management, and policy evaluation.

WHAT ARE WE DOING?

This task order aims to enhance Caltrans' capabilities in addressing current and future environmental regulations, particularly greenhouse gas emissions and pollutant in alignment with California Assembly Bill AB32. Work includes:

- Updating existing life cycle inventory databases every three years using new data from government sources and industry-submitted environmental product declarations (EPDs).
- Exploration of EPDs' potential use in LCA tools and procurement via a pilot project.
- Development of additional data and algorithms for LCA, considering various design, construction, maintenance, and rehabilitation strategies, along with technological advancements like new materials and equipment.
- Inclusion of additional processes not currently considered in Caltrans' analysis, such as pavement vehicle interaction, radiative forcing from solar reflectivity, and new end-of-life processes.
- Capability to conduct LCA at the conceptual design stage, considering various roadway structures and materials.
- Evaluation of policies and specifications on recycling and construction quality, including novel approaches to using recycled materials, renewable fuels, and performance-related specifications.
- Updating the eLCAP tool with new data, models, and



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features.

- Ensuring the developed database, models, and tool undergo outside critical review to instill confidence in the results produced.

WHAT IS OUR GOAL?

The goal is to expand, update and enhance Caltrans' capabilities to address current and future issues required to meet California Assembly Bill AB32, greenhouse gas (GHG) emission targets and category pollutant regulations, and to make more informed decision-making with respect to environmental, energy and resource use impacts through LCA.

WHAT IS THE BENEFIT?

The benefit is that by updating and enhancing Caltrans' ability to perform LCAs, they can make more informed decisions about transportation projects. This allows them to minimize environmental impacts, optimize energy use, and effectively manage resources, ultimately leading to more sustainable and efficient infrastructure development in California.

WHAT IS THE PROGRESS TO DATE?

Updating existing LCA inventories and developing new material inventories have been ongoing since the start date of the project and will continue for the duration of contract. Also, UCPRC continues participating in the Caltrans EPD committee meetings.