

Research Notes

Program Steering Committee (PSC): Pavement

JUNE 2014

Title: PPRC 11 SPE 3.20 - Life-Cycle Cost and Environmental Life-Cycle Analysis for Composite Pavements

Task Number: 2371

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Task Manager:

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TITLE:

Life-Cycle Cost and Environmental Life-Cycle Analysis for Composite Pavements

WHAT IS THE NEED?

Composite pavement is a specific pavement type which is consisted of rigid Portland cement concrete (PCC) pavement covered with flexible asphalt concrete (AC) surface layer. This type of pavement may be used to mitigate the impact of temperature and humidity variations on the cracking performance of PCC pavement when it is justified with life cycle cost analysis (LCCA).

Caltrans adopts the policy that life-cycle cost impacts are fully taken into account in the design process for all major pavement projects, and Caltrans-customized version of the FHWA software *RealCost* has been used for the analysis. However, input guidelines for composite pavement applications of *RealCost* still need to be developed.

WHAT ARE WE DOING?

This research will investigate the effect of design variables of composite pavement on the results of LCCA, and incorporate those results into Caltrans design manual and LCCA guidelines. The research goal will be achieved with the following tasks:

1. Set-up factorial for mechanistic design analysis for composite pavements (asphalt over concrete).
2. Conduct mechanistic design and analysis and investigate the effect of the selected input factorials on the result of LCCA.
3. Develop *RealCost* inputs for composite pavement applications.

WHAT IS OUR GOAL?

The main objective of the research is to incorporate the life-cycle cost analysis of composite pavements into Caltrans design manual and LCCA guidelines.

WHAT IS THE BENEFIT?

This research will provide improved LCCA guidelines including additional applicability for the analysis of composite pavements. The findings will also be used to justify in the use of composite pavements where appropriate.

WHAT IS THE PROGRESS TO DATE?

Initial scope of work has been modified by request from Caltrans Pavement Program. As a result, a task for updating Caltrans LCCA Manual was added in lieu of the environmental life cycle analysis task.

All work is completed except documentation. The research team prepared a draft final report, and it is under review. The final report will be delivered on schedule.