

Environmental**February 2025****Project Title:**

Local and State Government Policies to Improve Pavement Sustainability with New Materials

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Developing a Sustainability Framework: Integrating Low-Carbon Materials, Environmental Product Declarations, and Performance Metrics into California Department of Transportation Procurement Practices

WHAT WAS THE NEED?

This research was conducted to address the growing environmental impact of transportation infrastructure. Transportation projects have contributed to greenhouse gas emissions and resource depletion. In response to federal mandates for reducing carbon footprints, there was a pressing need for tools to better evaluate the environmental impacts of materials used in infrastructure projects. The California Department of Transportation (Caltrans) faced challenges with existing procurement methods, which lacked sustainability metrics. This research aimed to develop better tools, including Environmental Product Declarations (EPDs), to assess material impacts and guide decision-making in line with sustainability goals.

WHAT WAS OUR GOAL?

The goal of this research was to develop a procurement program that reduces environmental impacts while maintaining infrastructure functionality, focusing on incorporating low-carbon materials and sustainability tools like EPDs to meet environmental targets.

WHAT DID WE DO?

The research established a framework and practical procedures for reviewing and comparing pavement-related policies and technical decisions, and it also provided how-to details to analyze the life-cycle environmental and cost outcomes of policy changes as well as technical decisions,



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considering feasibility, scaling, opportunities, and obstacles to implement.

WHAT WAS THE OUTCOME?

The final report's recommended approach to implement the faster changes for reducing environmental impacts and protecting quality of life, includes details for:

1. **Setting Goals:** Establish goals for reducing environmental impacts based on legislation, regulation, and policies.
2. **Quantitative Assessment:** Use A1-A3 EPDs for material assessment and project carbon budgets.
3. **Material Grouping and Specifications:** Identify and group materials, update specifications for low-impact materials, and implement through engineering performance reviews.
4. **Incentive/Disincentive Thresholds:** Calculate and update environmental impact benchmarks and apply incentive/disincentive pricing using local data and EPDs.
5. **Market Signals and Communication:** Require plant and material-specific EPDs, set price-based incentives, and maintain open communication for transparency and feedback.

WHAT IS THE BENEFIT?

The benefits and implications of this research include:

1. **Environmental Benefits:** Reduced environmental impacts and better engineering performance.
2. **Conserve Resources:** Use of low-carbon materials can help preserve finite local aggregates.
3. **Improved Performance:** Enhanced testing and specifications ensure materials meet performance requirements.
4. **Cost Savings:** Low carbon infrastructure can have initial and lifecycle cost savings.

5. **Job Creation:** Creation and expansion of low-carbon material industries generate new jobs.

LEARN MORE

To view the complete report:

<https://escholarship.org/uc/item/2zk6v18t>