

Pavement

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Project Title:
Alternative Supplementary Cementitious
Materials (SCMs) Sources

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Alternative Supplementary Cementitious Materials (SCMs) Sources

Exploring alternative sources of SCMs in California

WHAT IS THE NEED?

There is an increasing interest in exploring the use of alternative supplementary cementitious materials (SCMs) in Caltrans concrete mixtures to reduce greenhouse gas (GHG) emissions. However, little is known on the regional and seasonal availability of the alternative materials, their production processes, logistics, costs, consistency of desirable properties, and potential environmental impacts associated with the use of the different alternative materials. This work will complement/support and partner with the US Forest Service Endowment and sub-contractor Oregon State University, and will include consultation with the concrete, agricultural and forest biomass, and biomass energy industries. Some of this work will extend work currently funded by the California Rice Research Board. Work will include testing of materials on pilot projects, and documentation of mix design development, construction, and initial performance on instrumented pavement test sections.

WHAT ARE WE DOING?

Phase 1 will review and identify the most promising potential materials including pozzolans made from locally abundant natural mineral materials, pozzolonic ash from agricultural biomass energy production, and cellulosic nano-materials from forest waste and agricultural biomass. Phase 2, if justified, will cover laboratory performance testing of selected materials for a full suite of performance related tests identified for concrete. Phase 3, if justified, will cover pilot project monitoring.



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WHAT IS OUR GOAL?

The goal is to identify alternative SCMs that come from local (i.e. California) and sustainable sources that reduce GHG emissions.

WHAT IS THE BENEFIT?

Local SCMs that improve the concrete durability will reduce concrete maintenance and replacement over its life-cycle and, thus, reduce our environmental impact over its life. Also, if the SCMs are from biological sources additional benefits can be realized from the reduction of biomass and possible energy generation. Recommendations, guidance, and specification language for the use of alternative cementitious and other biomass-based materials in California concrete pavement and other flatwork will help Caltrans improve its use of low-cost materials and reduce its environmental impact.