

Environmental

May 2025

Project Title: Address Microplastics from Thermoplastic Stripe and Markings

Task Number: 4052

Start Date: January 2, 2023

Completion Date: December 31, 2025

Task Manager:

Simon Bisrat
Senior Environmental Planner
Simon.Bisrat@dot.ca.gov

Address Microplastics from Thermoplastic Stripe and Markings

This task will establish effective control of microplastic particles (MPs) including thermoplastic paint-derived microplastic particles and other microplastics originating from Caltrans sources.

WHAT IS THE NEED?

The California Department of Transportation (Caltrans) is taking a proactive approach to understand the factors and processes that lead to microplastics generation from thermoplastic painted surfaces from its state highway system. The pervasive nature of microplastic pollution warrants a critical investigation of the many different potential sources of this emerging contaminant. Thermoplastic paint used in roadway markings and striping has been implicated as a source of microplastic pollution, potentially accounting for up to 7% of the microplastics that end up into our oceans. Its widespread use among our vast network of roads is a potential source of microplastics pollution to our soil and water environments. Current roadway marking alternatives lack the longevity and retroreflectivity performance of thermoplastic paints and are also cost-prohibitive. Therefore, understanding the factors and processes that lead to microplastics generation from thermoplastic painted surfaces could lead to a cost-effective strategy for microplastic hazards mitigation by defining appropriate conditions for the application of thermoplastic stripes and markings that eliminate or minimize the microplastic hazard.

WHAT ARE WE DOING?

The goal of this task will be achieved through developing effective and low-cost treatment strategies for of MPs found in roadway runoff that could be implemented with minor modifications to existing infrastructure. This project will be divided into two phases. The first phase will design, construct, and validate the microplastics treatment system. The second phase will develop best management practices that will



DRISI provides solutions and knowledge that improves California's transportation system.

be founded on evidence-based principles for optimal and effective use of the newly designed microplastics treatment system.

WHAT IS OUR GOAL?

The primary goal of this project will be to develop a modeling tool that will help Caltrans practitioners simulate different vegetative barrier scenarios that will help them select optimal vegetative barriers.

WHAT IS THE BENEFIT?

Caltrans will be able to reduce microplastic pollutions from Caltrans facilities and address future water quality permitting requirements.

WHAT IS THE PROGRESS TO DATE?

A research team from California State University Long Beach and Fullerton campuses has been selected and the project started on May 2023. The project is progressing well and will be completed by May 31, 2025, as planned.