DRISI

Caltrans Division of Research, Innovation and System Information

Research Notes

An Assessment of Paved Road Dust Emissions (Road Dust) Modeling Methods

Develop a more reasonable and realistic road dust (PM_{10} and $PM_{2.5}$) emissions factor model.

Environmental

SEPTEMBER 2021

Project Title:
An Assessment of Paved Road Dust Emissions (Road Dust) Modeling Methods

Task Number: 3785

Start Date: January 2, 2022

Completion Date: December 31, 2023

Task Manager:
Simon Bisrat,
Senior Environmental Planner
simon.bisrat@dot.ca.gov

WHAT IS THE NEED?

As exhaust (tailpipe) emissions of particulate matter (PM) from motor vehicles continue to decrease over time, road dust emissions have become an increasingly important component of project-level PM emissions. Air quality specialists must use the United States Environmental Protection Ahency's Emission Factor Handbook (AP-42) road dust equation to estimate road dust PM emissions in project-level air quality analyses.

However, as described in one of Caltrans' Division of Environmental Analysis Tech memos (Title: Assessment of Paved Road Dust Emissions Modeling Methods) dated June 30, 2020, there are several key limitations in the current AP-42 road dust emission factor model that contribute to the unknown magnitude of uncertainty in estimating PM road dust emissions in air quality analyses in Caltrans projects.

Moreover, the current AP-42 road dust emission factor model has not been verified against high traffic volume transportation projects (note that high traffic volume can be easily found in most of urban areas in California). Accordingly, PM road dust emissions by the current AP-42 method for California freeways with high volumes are questionable.

In fact, it is believed that the current AP-42 road dust method would likely yield biased PM emissions for high traffic volume transportation projects. Accordingly, more reasonable and realistic road dust PM emission factor model is needed for air quality analyses in Caltrans projects.

WHAT ARE WE DOING?

The research team will conduct a new road dust emissions measurement study and develop road dust (PM_{10} and $PM_{2.5}$) emission factor equation(s) that can be used for project-level air quality analyses in California.

WHAT IS OUR GOAL?

The goal of this research project is to deliver a more reasonable and realistic road dust (PM_{10} and $PM_{2.5}$) emissions factor model (equation) for California freeway with high traffic volume.

WHAT IS THE BENEFIT?

Caltrans will be able to evaluate transportation projects' air quality impacts more reasonably on surrounding communities for transportation conformity, National Environmental Policy Act, and California Environmental Quality Act, resulting in better-informed and more environmental-friendly decision-making.

Additionally, a more realistic and proper transportation air quality analyses will lead to better public health protection.

WHAT IS THE PROGRESS TO DATE?

A research team from University of California Riverside campus has been selected and this task is at its contract preparation phase with an anticipated start date of January 2022.