DRISI

Caltrans Division of Research, Innovation and System Information

Research Notes

Evaluation of the 2015 Smoothness Specification

To determine the factors and conditions contributing to the contractors' ability to meet the pavement specifications

Pavement

SEPTEMBER 2019

Project Title:
Evaluation of the 2015 Smoothness Specification

Task Number: 3205

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Completion Date: September 30, 2020

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WHAT IS THE NEED?

The objective of this project is to determine the factors and conditions contributing to the contractors' ability to meet the pavement specifications. California Department of Transportation (Caltrans) historically used the California profilograph to identify bumps in the newly paved surface before approving the project completed by contractor.

Caltrans implemented 2015 Standard Special Provision (SSP) 39-1.12 for asphalt pavement and revised SSP 40-1 for concrete pavement, both require the contractor to determine pavement smoothness profiles using an inertial profiler and the Mean Roughness Index (MRI), an average of the International Roughness Index (IRI) from both wheel paths, as the roughness parameter for construction smoothness.

After a couple of years since the implementation of the profiler-based specification, the question remains whether contractors can meet the specification without grinding; and if grinding is used, how much grinding is needed to achieve the required smoothness after paving.

Answering this question will help decide under what conditions it might be in Caltrans' interest to modify the current specifications, or require and pay for grinding across the entire pavement.

This research will also address other areas like the effectiveness of pre-paving repairs, the pre-paving IRI, and the treatments and techniques that produce smooth pavements.

WHAT ARE WE DOING?

This study will evaluate contractor performance under the profiler-based IRI specifications using:

- Automated Pavement Condition Survey IRI data
- Pavement Management System as-built data
- Quality assurance IRI data from construction projects
- IRI testing by the University of California Pavement Research Center (UCPRC)

This objective will be achieved through completion of the IRI Data Comparison on Portland Cement Concrete and IRI Data Comparison on Hot Mix Asphalt.

The final delivery of the project is the Summary Report of all IRI Testing.

WHAT IS OUR GOAL?

The goal of this project is to evaluate the change in smoothness from a concrete or asphalt paving treatment; and the ability of contractors to meet current specifications without grinding, and if grinding is necessary, how much is needed.

WHAT IS THE BENEFIT?

The study provides extensive data showing how well the new smoothness specification has been functioning on concrete projects. Engineers can use the data to achieve more accurate prediction of pavement performance in the design procedures leading to more optimized design with most cost-effective use of resources.

WHAT IS THE PROGRESS TO DATE?

Researchers compared contractor quality assurance data for IRI with Caltrans contract acceptance data and UCPRC IRI measurement data on concrete paving projects completed in the 2018, 2019 and 2020 (up to June) construction seasons.

Construction projects were selected by Caltrans Office of Concrete Pavements. IRI data were collected on any concrete paving project on which the new specification is applicable.

Arrangements was made with Resident Engineers (REs) to obtain IRI measurements from the contractor and Caltrans. IRI data were collected three times: initially before paving, again after paving but before any corrective actions, and finally after acceptance.

More arrangements will be made with REs to survey paving operations and obtain information regarding the amount of diamond grinding performed to meet the acceptance specifications.