

## Research Notes

Program Steering Committee (PSC): Pavement

JUNE 2014

Title: PPRC14 SPE Pres-A: Effects of Pavement Roughness on Freight Movement

Task Number: 2723

Start Date: July1, 2014

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### TITLE:

Effects of Pavement Roughness on Freight Movement

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### WHAT IS THE NEED?

There is a need for data and information about vehicle-pavement-freight interaction that will support Caltrans's goods movement plans and programs in preserving and sustaining the state's surface transportation infrastructure, meeting federal and state legislation requirements, and strengthening California's economy.

A Pilot Study was completed by Caltrans in 2014 with the purpose of supporting preservation of pavements and long-range plans including the California Transportation Plan, the California Interregional Blueprint, and shorter to medium-term Caltrans efforts including the State Freight Mobility Plan, and activities to meet legislation goals of AB 32 (greenhouse gas emission reductions) and requirements in SB 391 (sustainable communities). The Pilot Study included evaluation of truck, pavement, and freight interaction on a few local roads and state highway routes in northern California two industrial sectors through applying the principles of Vehicle-Pavement Interaction (V-PI) and state-of-the-practice tools to simulate and measure peak loads and vertical acceleration of trucks and their freight on a selected range of typical pavement surface profiles.

Successful completion of the Pilot Study confirmed the need to extend and expand the effort with the overall objective to help enable Caltrans to better manage the risks of decisions regarding pavement preservation with wider consideration of trucks and freight that affect and are affected by pavement preservation decisions such as when and how to resurface and improve riding quality earlier or to delay such a decision for a specific pavement.

### WHAT ARE WE DOING?

Findings from the Pilot Study supported a conclusion to expand evaluation to additional Caltrans Districts and routes with varying levels of pavement riding quality and further study of potential vehicle operating costs, freight damage and environmental effects. Recommendations also included expanding the study of freight damage to other types of freight, more detailed freight damage relationships, and examination of pavement quality control implications.

This research will continue efforts initiated in the Pilot Study to assess effects of roughness on the cost of freight transport, choice of routes by haulers, and on emissions. Additional types of freight, districts, and routes will be assessed. Project activities are planned to include identifying potential freight routes and selecting specific ones for investigation and evaluating effects of pavement roughness including decisions of route selection for freight haulers.

A project report will present results and findings from the research, summarize the effects of pavement roughness on vehicles and freight, and provide recommendations to Caltrans pavement preservation policies and procedures related to goods movement.

### **WHAT IS OUR GOAL?**

The goal of this task is to expand the investigations in Pilot Study, increasing the data and information about vehicle-pavement-freight interaction to support Caltrans's pavement preservation and goods movement plans and programs. A final project report will include recommendations about pavement preservation and maintenance prioritization with regard to effects of freight movement in California.

### **WHAT IS THE BENEFIT?**

Overall this task will help to improve pavement preservation and sustainability and to help identify interactions with vehicles and freight in goods movement. Expanded information and better understanding of these interactions may improve operations, contribute to cost-effective decisions, reduce environmental impacts (including greenhouse gas emissions), meet state and federal legislation requirements, and strengthen California's economy.

### **WHAT IS THE PROGRESS TO DATE?**

This is a new task that will begin in FY 2014-15.