

DRISI

CALTRANS DIVISION OF RESEARCH,
INNOVATION AND SYSTEM INFORMATION

Research Notes

Pavement

FEBRUARY 2024

Project Title:
Pavement Structural Evaluation with
Traffic Deflection Devices (TSDDs)

Task Number: 3701

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Completion Date: October 31, 2023

Task Manager:
Jessaneil Perez
Research Engineer
Jessaneil.perez@dot.ca.gov

Pavement Structural Evaluation with Traffic Deflection Devices (TSDDs)

This pooled-fund project provides Caltrans with the opportunity to test available TSDDs as part of demonstration project and guidelines on how to specify collection and use data collected with TSDDs.

WHAT IS THE NEED?

Some highway agencies have investigated the use of Falling Weight Deflectometer (FWD) for pavement management applications. While FWDs are common for project level structural evaluation, they are inefficient at the network level. FWD measurements are made at discrete points along the pavement sections and the equipment must remain stationary on the road during each testing point. This requires lane closures that disrupt traffic and traffic control, which limits the productivity and the number of discrete points where measurements can be obtained.

Over the last 15 years, traffic speed deflection devices that can near continuously measure pavement structural condition while traveling at traffic speed have been developed. However, to effectively implement TSDDs and incorporate TSDD data in pavement management decision-making, guidance is needed on data collection protocols; data interpretation guidelines for network and project level applications; and developing a framework to implement continuous deflection measurements as part of the agency's pavement management system.

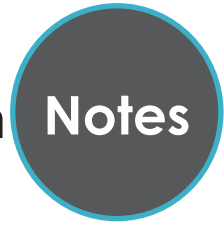
WHAT ARE WE DOING?

This project includes the following tasks:

- Develop a list of available devices and their characteristics. This will include details about the number of devices currently in operation and the type of data they collect.
- Develop data collection guidelines and specifications for agencies. This will include reviewing best practices from



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around the world and will be coordinated with service providers to ensure that proposed guidelines can be implemented.

- Develop guidelines on how to incorporate pavement structural condition data into agency network-level pavement business processes. This will include defining what structural indices to use and investigating how the structural condition data can complement currently collected surface condition data to make better decisions.
- Demonstrate how structural condition collected from TSDDs can be used for supporting project level decision-making based on case studies.
- Demonstrate the cost effectiveness of collecting structural condition data at both the network and the project levels through case studies.
- Collect data on at least 100 miles of interstate or primary type pavements for each year of participation with the option to include additional testing at additional commitment levels.
- Organize and deliver workshops and training materials for the consortium members.

WHAT IS OUR GOAL?

The objective of the proposed pooled-fund project is to establish a research consortium focused on providing participating agencies guidelines on how to specify collection and use data collected with TSDDs for network- and project-level, if feasible, pavement management applications. Specific tasks within this multi-year program are to be developed in cooperation with the consortium participants. In addition, the consortium is to provide participating agencies with a mechanism to conduct pilot demonstration testing in their respective networks.

WHAT IS THE BENEFIT?

This pooled-fund project provides Caltrans with:

- The opportunity to test available TSDDs as part of demonstration project
- Guidelines on how to specify collection and use data collected with TSDDs for network- and project-level, if feasible, pavement management applications

WHAT IS THE PROGRESS TO DATE?

This research project was completed in October 2023. The final report will be posted once completed.

The main findings of this project were presented at the 2023 Transportation Research Board Meeting: Scavone, M. Katicha, S., Flintsch, G., and Amarrh E. "Estimating Load Transfer Load Transfer Efficiency for Jointed Pavements from TSD Deflection Velocity Measurements."