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CALTRANS DIVISION OF RESEARCH, INNOVATION AND SYSTEM INFORMATION
TRANSFORMING IDEAS INTO SOLUTIONS

Research Notes

Advanced Image Analysis of Automated Pavement Condition Survey (APCS) Data

Examine methods to use APCS data for shoulder and drainage evaluations.

Pavement

May 2026

Project Title: PPRC23: Pavement Management System

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WHAT IS THE NEED?

The California Department of Transportation (Caltrans) manages its pavements with a new and modern pavement management system, PaveM. One key component to the system is the automatic pavement condition survey (APCS) which collects millions of rights-of- way (ROW) and downwards images of the pavement. This data can be used to improve the pavement survey and other aspects of maintaining a roadway (e.g. drainage, etc.).

WHAT ARE WE DOING?

The annual APCS survey collects a very large amount of data on the Caltrans network. While many condition variables are derived from the data, there are many opportunities to use deep learning and other advanced methodologies to extract additional information from the images and surface profile data, which has already been started in the current contract. This project would focus on moving the models developed in the current contract into vendor practice, improving or building on those models, and developing new models as needed for PaveM and other Caltrans users.

WHAT IS OUR GOAL?

A tech memo on models developed, and models that could be used by a vendor.

WHAT IS THE BENEFIT?

The improved APCS data will allow PaveM to make better pavement predictions and, thus, Caltrans can be more proactive in maintaining its pavements. This will lead to

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reduce maintenance costs and create savings by maintaining longer lasting pavements.

WHAT IS THE PROGRESS TO DATE?

Installed and enabled deep learning hardware. Continued work on slab replacement model and new shoulder model. Worked on documenting slab replacement model. (75% of work is completed).

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