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

Research Notes

TPF-5(494) WeatherShare VI

Maintaining and supporting the WeatherShare System to provide reliable rural road-weather data for the California Department of Transportation (Caltrans) operations and safety management.

Rural

November 2025

Project Title: WeatherShare – A One-stop Shop for Weather Information

Task Number: 4501

Start Date: May 22, 2024

Completion Date: January 28, 2027

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WHAT IS THE NEED?

The WeatherShare System requires continued external support because Caltrans IT is unable to take over its long-term maintenance, and the previous maintenance contract ended in March 2023. This contract focuses on sustaining the existing system rather than developing new features.

WeatherShare is an essential tool that consolidates weather and roadway data for Caltrans maintenance and operations staff, particularly in rural areas where fewer alternative routes are available during severe weather. Keeping the system operational supports safer and more efficient travel across rural highways.

WHAT ARE WE DOING?

This project focuses on the ongoing maintenance, support, and monitoring of the WeatherShare System, which aggregates weather and roadway data from RWIS and other sources for Caltrans operations personnel. The maintenance phase replaces multiple proprietary systems with a single, open platform for weather data reporting and alerting.

Key technical activities include comprehensive server and code administration across production, staging, and testing environments. This involves applying routine updates and patches, performing code maintenance tracked via GitHub, and monitoring system functionality, application layers, and data feeds. Log files will be regularly reviewed for errors, anomalies, or potential security issues, and key weather events will be documented through screenshots and data captures for demonstration and testing purposes.

Project management activities run in parallel, including stakeholder communications through kickoff and regular project meetings, quarterly reporting of progress and planned work, and maintenance of a public informational website

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detailing the project's history, goals, status, and timeline. The combined technical and management efforts ensure the system remains reliable, secure, and fully operational.

WHAT IS OUR GOAL?

The goal of this project is to ensure the WeatherShare System remains fully operational, reliable, and secure, providing Caltrans maintenance and operations personnel with accurate and timely weather and roadway data. By maintaining a single, consolidated platform, the system replaces multiple proprietary applications, improving efficiency and accessibility of critical weather information for decision-making and response.

A key objective is to support rural and statewide transportation operations by monitoring, updating, and administering the system's servers, code, and data feeds. This includes detecting and addressing errors, anomalies, or security issues, as well as documenting key weather events to enhance system functionality and support future testing or demonstrations.

Additionally, the project aims to maintain clear communication with stakeholders and provide transparency through regular progress reporting and a publicly accessible informational website. Overall, the goal is to sustain a robust and responsive system that enhances roadway safety, mobility, and operational readiness across California.

WHAT IS THE BENEFIT?

The primary benefit of this project is improved safety and mobility for travelers on rural highways. By keeping the WeatherShare System fully operational, Caltrans maintenance and operations personnel can access timely road-weather information, allowing them to respond quickly to hazardous conditions. This real-time data aggregation from RWIS and other sources helps reduce delays, prevent accidents, and mitigate the impacts of severe weather on rural roadways.

In addition to immediate operational benefits, maintaining WeatherShare supports broader transportation goals by addressing the unique challenges of rural travel. Although rural highways represent a smaller portion of the overall network, they account for a significant share of travel and often have limited alternative routes. Ensuring reliable weather information helps protect this underserved population, enhancing safety and mobility in areas that are particularly vulnerable during extreme events.

WHAT IS THE PROGRESS TO DATE?

Project progress has included both management and technical activities. Regular calls and meetings were held, with a progress update provided to the Western States Rural Transportation Consortium Steering Committee. A senior design team updated backend routines for RWIS data ingest, processing, and storage, producing revised documentation, source code, and a poster presented at Montana Tech's TechXpo. On the technical side, ongoing system maintenance was performed on the One-Stop-Shop and WeatherShare platforms, including server upkeep, installation of new SSL certificates, and data archival.

The following steps include continuing project management through calls and meetings as needed, as well as initiating a new Senior Design project to overlap with ongoing work. On the technical side, regular maintenance will continue for the One-Stop-Shop and WeatherShare systems to ensure their continued operation and reliability.