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

Research Results

Responder Study - Interim Phase II - Continued Support for Responder Transition

Continue support for the Responder system to transition to a third-party vendor.

Rural

DECEMBER 2025

Project Title: Responder System - A Communication Tool for First Responders

Task Number: 4008

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WHAT WAS THE NEED?

The California Department of Transportation (Caltrans) maintenance staff respond to roadway incidents but lack an efficient way to collect and share information with the Transportation Management Center (TMC) and other responders. Rural districts often have limited radio or cellular coverage, making communication difficult. Caltrans needs a tool that enables sharing photos, drawings, weather, and maps during incidents, using any available communication method statewide.

WHAT WAS OUR GOAL?

- Enable responders to collect and share incident information quickly and efficiently, especially during major incidents and in remote areas with limited communication.
- Support new or inexperienced first responders with reliable information tools.
- Complete the transition of the prototype Responder system from the University of California, Davis' (UC Davis) Advanced Highway Maintenance and Construction Technology (AHMCT) Research Center to a third-party vendor.
- Provide technical support before and after vendor contracting.
- Procure and maintain one additional year of satellite, cellular, and email services for two Responder systems.
- Document all non-Caltrans data feed addresses and assist in setting up Caltrans accounts for these feeds.

Caltrans

DRISI provides solutions and knowledge that improves California's transportation system.

WHAT DID WE DO?

The AHMCT Research Center has developed the third-generation Responder system—a communication tool for incident responders, especially in rural areas with limited coverage.

Responders use smart devices to capture, annotate, and transmit images, access weather and maps via Global Positioning System (GPS), and send information efficiently to managers and the Transportation Management Center (TMC) using cellular or satellite networks.

The system minimizes data entry, allowing responders to focus on the incident scene. Beta testing in several Caltrans districts received positive feedback, highlighting improvements in responder safety and effectiveness. The prototype will transition to a third-party vendor for enhancements, additional units, and statewide deployment.

WHAT WAS THE OUTCOME?

Caltrans has changed their business practices since this system was developed. To be utilized in the new environment within Caltrans two revisions should occur:

1. Software is redesigned from an Android operating system for handheld devices to the iOS.
2. Removal of the arbiter from the system and a pilot study of utilizing Starlink as the backup to cellular data.

WHAT IS THE BENEFIT?

The Responder system allows responders to utilize resources effectively by:

- Supporting the ability to evaluate what is happening at the scene from a maintenance station or TMC without extended delay.
- Sending correct employees and equipment to the incident, based on initial information that can be seen in the photo(s) and/or report(s) submitted by staff at the incident scene.
- Providing real-time information to other staff, such as the Public Information Officer (PIO), who may have to answer to outside agencies regarding what is happening at the incident.

LEARN MORE

AHMCT Responder Project Link:
https://ahmct.ucdavis.edu/responder

AHMCT Report Link:
https://ahmct.ucdavis.edu/sites/g/files/dgvnsk8581/files/inline-files/UCD-ARR-25-12-15-01.pdf

IMAGES

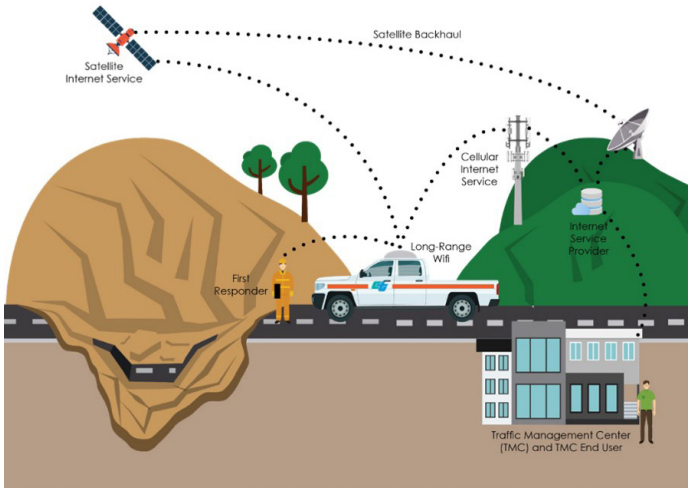

Image 1: Responder Architecture.

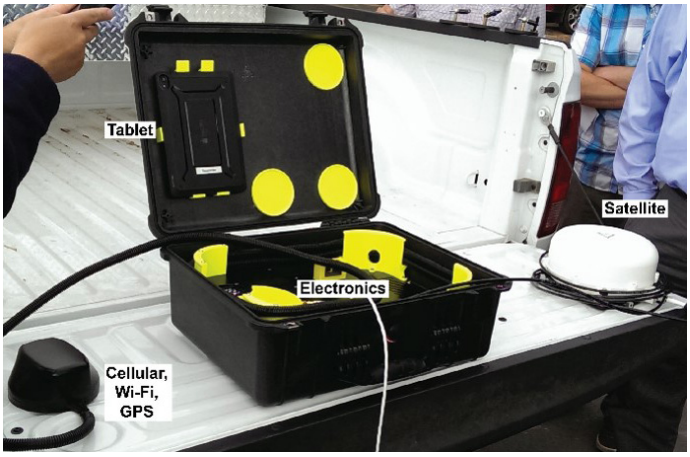

Image 2: Responder Mobile Unit.

Image 3: Responder Mobile Unit.