DRISI
Caltrans Division of Research, Innovation and System Information

# Research Notes

Rural

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Project Title:
Responder – Reproduction and Deployment Phase

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## Responder – Reproduction and Deployment Phase

Responder system allows Caltrans first responders to collect and share at scene information quickly and efficiently.

### WHAT IS THE NEED?

Caltrans maintenance staff is often first on scene to incidents on the state roadways. They must collect information, determine the appropriate response, and access and manage resources at-scene. Currently, Caltrans does not have an efficient means to collect at-scene incident information, and share this information with the Transportation Management Center (TMC) and other emergency responders.

In most districts, employees responding to incidents rely on voice communications to exchange information. However, Caltrans rural districts lack the ability to distribute incident support information to responders via data networks. Such information could better prepare responders for incident support, provide assistance for incident management, and guide responders in making safe and sound decisions.

These rural districts have areas with no communication availability, such as two-way radio communication and/or cellular coverage. Caltrans needs a communication tool for first responders to allow photos, drawings, weather information, and maps to be shared between responders and a TMC during an incident via cellular, satellite, or other forms of communications, that will work anywhere in the State.

### WHAT ARE WE DOING?

The researchers at the University California, Davis - Advanced Highway Maintenance and Construction Technology (AHMCT) Research Center have finalized the third generation of the Responder system. This prototype communication tool integrates hardware, software, and communications to provide incident responders, particularly those in

rural areas, with sparse communication coverage, with a user-friendly interface to accurately collect and communicate at-scene information with their managers and the TMC.

The incident responder uses a smart device such as a tablet or smartphone to operate the Responder system. Unique features of the system include ability for users to capture, annotate, and transmit images. Using Global Positioning System (GPS) readings, the system automatically downloads local weather, retrieves maps and aerial photos, and pinpoints the responder's location. By simply clicking on the "Send" button, an email message is automatically composed and sent to the TMC or other parties.

The system connects to the most efficient and available service (cellular, satellite, or other). The system uses cellular where it can, and satellite in areas with no other communications. The system allows responders to concentrate on work at the scene without burdening them with data input and reporting.

## WHAT IS OUR GOAL?

The Responder system allows responders to collect and share at-scene information quickly and efficiently. It is especially valuable in:

- Major incidents such as wildfires, landslides, floods, and earthquakes, where the damage could be extensive.
- Remote rural areas where communication is often limited to voice, and coverage is sparse.
- When the first responder is new or inexperienced in responding to certain situations.

## WHAT IS THE BENEFIT?

The Responder system allows responder utilizes resources effectively by:

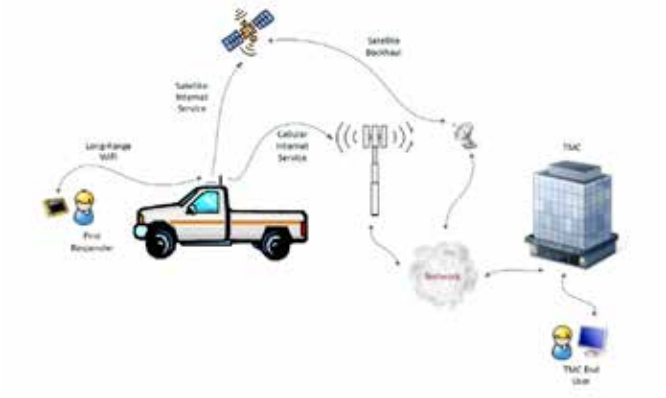
- Supporting the ability to evaluate what is happening at the scene from a maintenance station or TMC without extended delay.
- Sending correct employees and equipment to the incident, based on initial information that can be seen in the photo(s) and/or report(s) submitted by staff at the incident scene.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

## WHAT IS THE PROGRESS TO DATE?

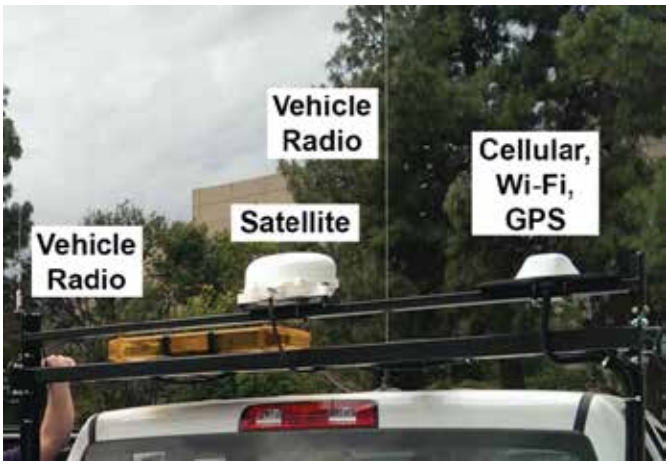
The Responder system was beta-tested in various California Department of Transportation (Caltrans) Districts including the Sacramento, Bay Area, Lassen, Siskiyou, Mono, and Inyo regions. The Caltrans field staff provided positive feedback, which reiterated the purpose of the Responder system. It is a useful tool for Caltrans responders, potentially an improvement in health, life or safety during a serious incident.

Caltrans is in the process of transitioning the Responder prototype system from AHMCT to a third-party vendor to enhance and upgrade the system. The vendor will purchase the off-the-shelf equipment for additional Responder system units, reproduce the software and hardware for the additional Responder system, and deploy the systems into the 12 Caltrans Districts. Caltrans Division of Maintenance is sponsoring and funding the implementation and deployment of the Responder system.

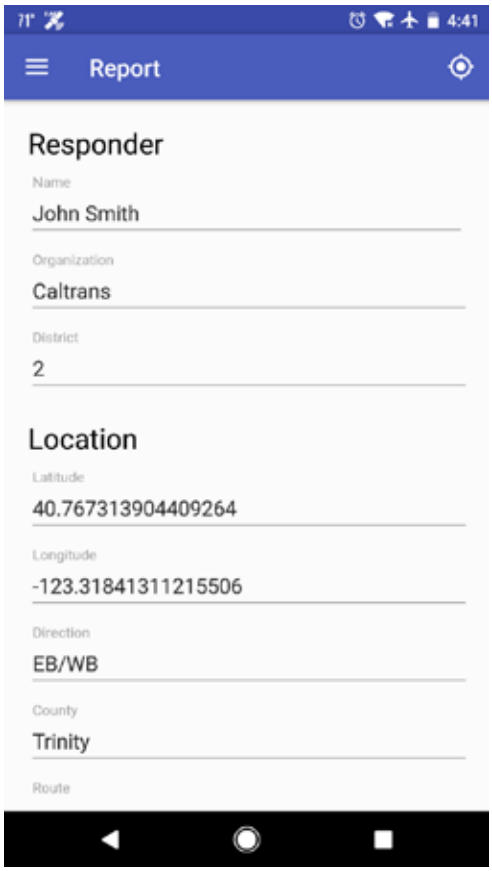
## IMAGES



Picture 1: Responder System Overview




Picture 2: Responder System Installed on Caltrans Vehicle




Picture 3: Sample Responder Report Screen