

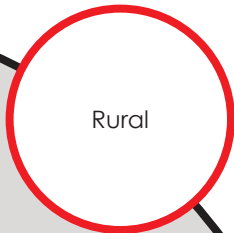


Caltrans Division of Research,
Innovation and System Information

Research



Results



Rural

JUNE 2018

Project Title:
Responder Study Phase 3:
Testing and Support

Task Number: 2927

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Responder Study Phase 3: Testing and Support

Conduct field testing over different seasons and weather conditions to ensure the Responder system will still work properly given the various climates in California.

WHAT WAS THE NEED?

Caltrans maintenance staff is a first responder to incidents on the state roadways. They must collect information, determine the appropriate response, and access and manage resources at-scene. Caltrans currently does not have an efficient means to collect at-scene incident information and share this information with their transportation management center (TMC) and other emergency responders in other agencies. In most districts, emergency responders 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 including no two-way radio communication and/or cellular coverage.

The Responder system is a prototype communication tool that integrates hardware, software, and communications to provide incident responders, particularly those in rural areas with sparse communication coverage, with an easy to use means 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 allow them to take photos, make drawings/notes, get weather information, determine location of incident, view local maps, and retrieve Road Weather Information System (RWIS) or Changeable Message Sign (CMS) feeds, and much more. All of this information can be shared between responders and a TMC through e-mail during an incident via cellular, satellite, or other forms of communications, that will work anywhere in the State.



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

WHAT WAS OUR GOAL?

The work on developing a prototype of the Responder system was conducted during a previous research phase. The goal of the current research phase was to field test the system over different seasons, weather conditions, and varied terrain to ensure the Responder system would still work properly given the various climates in California.

WHAT DID WE DO?

1. Support Responder field testing by Caltrans staff in Districts 2, 3, 4, and 9.
2. Revise Responder hardware and software as needed based on deficiencies identified in field testing.
3. Document any enhancement requests from the districts which are not in the requirements, and provide this document to Division of Research, Innovation and System Information (DRISI) for future consideration.
4. Ensure that the system minimizes data transfer and is not reliant on a continuous connection to central infrastructure.
5. Validate through field testing that Responder provides access in rural areas (District 2, 3 and 9) where traditional terrestrial communications systems (i.e., cellular or two-way radio) are not available.
6. Field test in an urban district (District 4) to demonstrate that Responder will work anywhere in California.

WHAT WAS THE OUTCOME?

The Responder system was field tested in Caltrans Districts 2, 3, 4, and 9, and a second round of pilot testing was just completed in District 2 in January 2018. The staff provided positive feedback, which reiterated the purpose of the Responder system which is meant to be a useful tool for field maintenance first responders, potentially providing improvement in health/life/safety during a serious incident.

The next phase of the development is to transition the prototype from AHMCT to a third-party vendor to reproduce more Responder system units and deploy them into the Caltrans districts.

WHAT IS THE BENEFIT?

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

- Major incidents such as 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.

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.

LEARN MORE

Final Report:

<http://ahmct.ucdavis.edu/pdf/UCD-ARR-18-06-30-02.pdf>

Websites: AHMCT – Responder

<http://ahmct.ucdavis.edu/projects/responder/>

Caltrans Active Research - Responder:
Reproduction and Deployment Phase

<https://dot.ca.gov/-/media/dot-media/programs/research-innovation-system-information/documents/research-notes/task3613-rms-5-19-a11y.pdf>

IMAGES

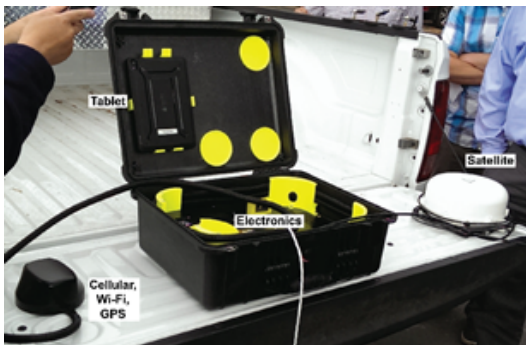


Image 1

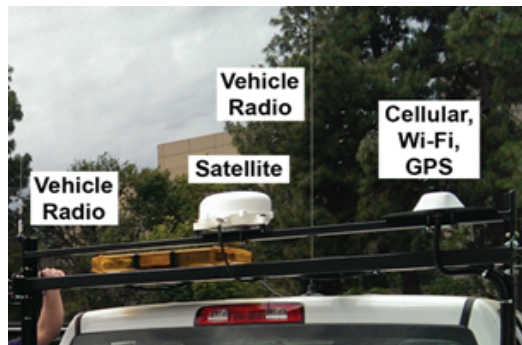


Image 2



Image 3



Image 4



Image 5



Image 6



Image 7

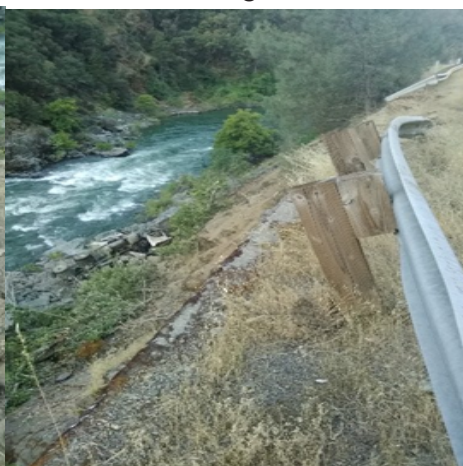


Image 8

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Image 9

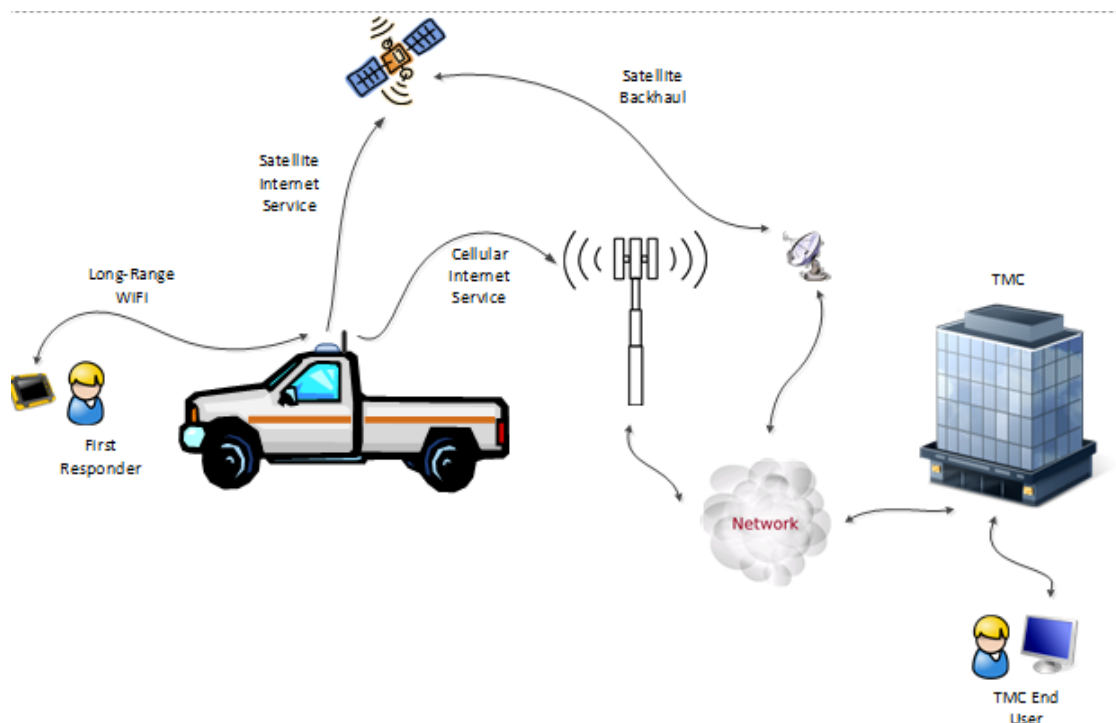


Image 10: Responder Architecture

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