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

Research Notes

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

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

Rural

MAY 2025

Project Title:
Responder System – A communication tool for first responders

Task Number: 4008

Start Date: January 1, 2022

Completion Date: June 30, 2025

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WHAT IS THE NEED?

California Department of Transportation (Caltrans) maintenance staff is the responder 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, incident 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, aid with 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 those responding 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 of 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

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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. The unique features of the Responder system include the 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.

The Responder system was beta-tested in various Caltrans Districts: Lassen, Siskiyou, Sacramento, Bay Area, Mono, and Inyo regions. The Caltrans field staff provided positive feedback, which reiterated the purpose of the Responder system is meant to be a useful tool for field maintenance first responders, potentially an improvement in health, life, or safety during a serious incident.

The Responder prototype system will be transitioned from AHMCT to a third-party vendor to enhance and upgrade that is not covered during the transition phase, purchase off-the-shelf equipment for additional Responder system units, reproduce the software and hardware for the additional Responder system, and deploy those Responder systems into all Caltrans Districts.

WHAT IS OUR GOAL?

The Responder system allows those responding to incidents 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.
- New or inexperienced first responder responding to certain situations.

The purpose of this phase would be to complete the transition of the prototype Responder system from AHMCT to a third-party vendor including the following:

- Technical support prior to vendor contracting.
- Initial vendor support following vendor contracting.
- Procurement and maintenance of one additional year of satellite service, cellular service, and email provider service for the two Responder systems.
- Documentation of all non-Caltrans data feed addresses, and assistance in setting up Caltrans accounts for these data feeds where needed.

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.

WHAT IS THE PROGRESS TO DATE?

- The research team support the two existing Responder systems

- Update Responder Android tablets and associated software.
- Update Responder computer, case, and associated software.

- Next step will be for research team to provide vendor training and technical support once the contractor is selected.

IMAGES

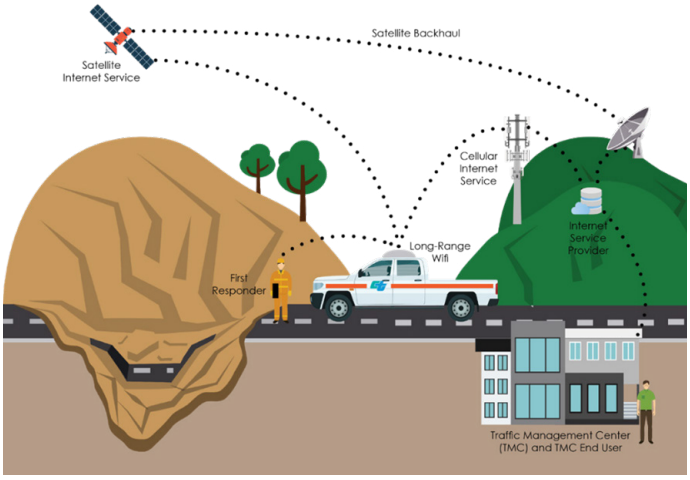

Image 1: Responder Architecture.

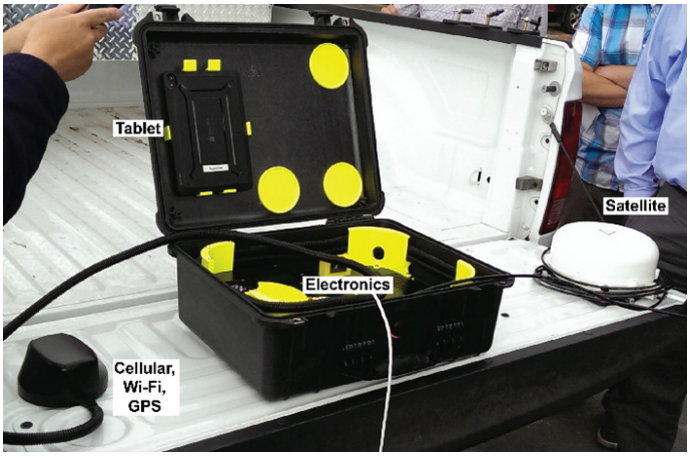

Image 2: Responder Mobile Unit.

Image 3: Responder Mobile Unit.

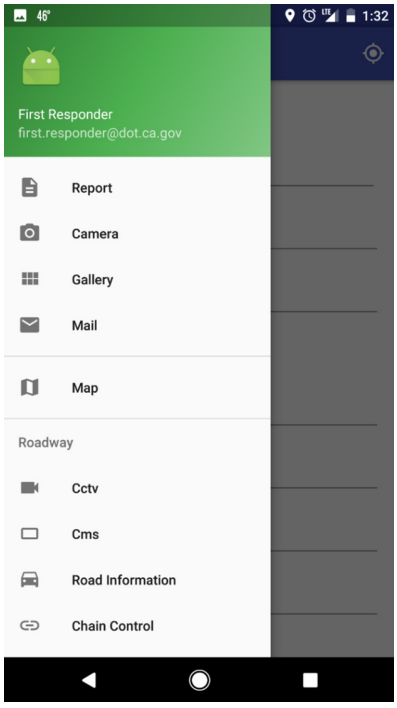

Image 4: Responder Application Menu Screenshots.

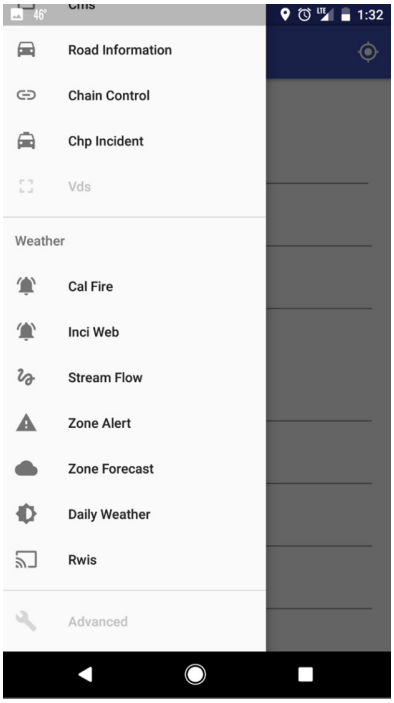

Image 5: Responder Application Menu Screenshots.

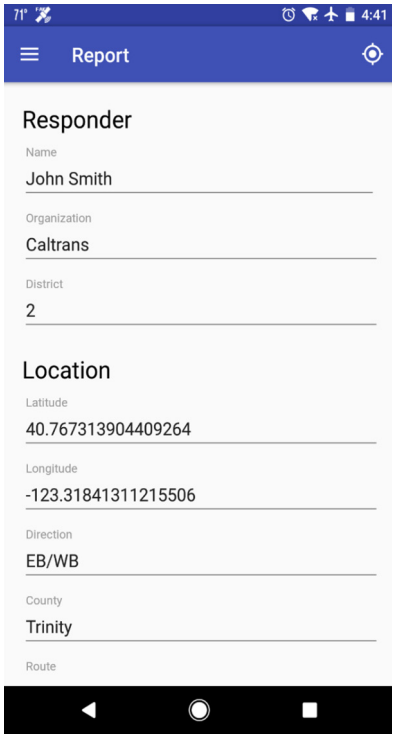

Image 6: Responder Application Report Screenshots.

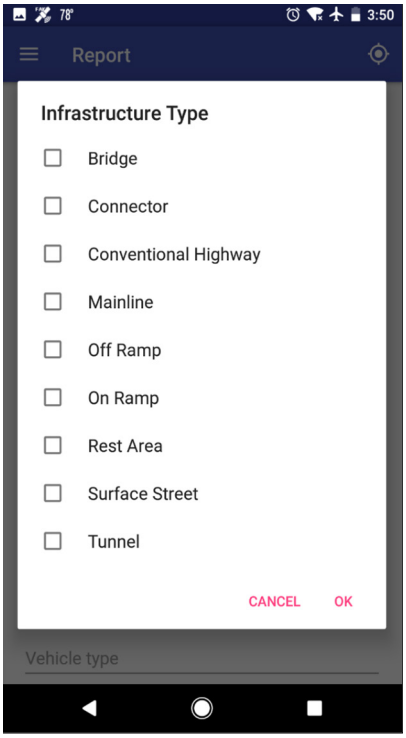

Image 7: Responder Application Report Screenshots.

Image 8: Responder Application Photo Screenshots.

Image 9: Responder Application Gallery & Annotation Screenshots.

Image 10: Responder Application Gallery & Annotation Screenshots.

Image 11: Responder Application Map & CCTV Screenshots.

Image 12: Responder Application Map & CCTV Screenshots.

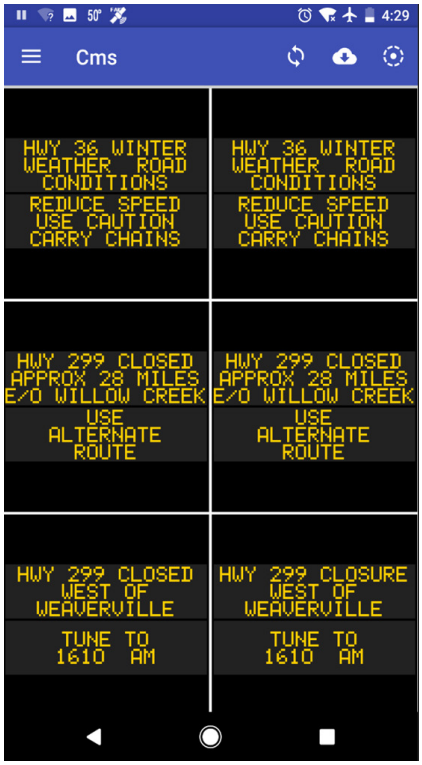

Image 13: Responder Application CMS & Chain Control Feed Screenshots.

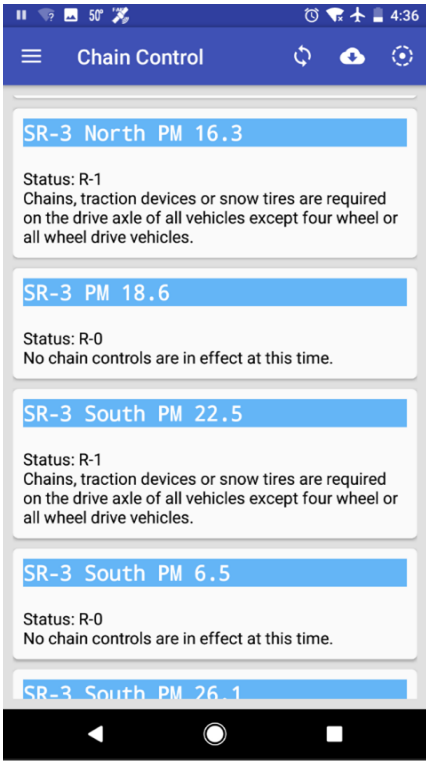

Image 14: Responder Application CMS & Chain Control Feed Screenshots.