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Mapping Roadkill to Improve Driver and Wildlife Safety on Highways

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## TOOL PROFILE:

# Mapping Roadkill to Improve Driver and Wildlife Safety on Highways

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### Issue

Wildlife-vehicle collisions (WVC) pose a risk to drivers and cost U.S. society billions of dollars annually in property damage, emergency response, maintenance and mitigation, and lost economic activity. Reducing WVC requires identifying where these collisions are most common and what activities improve safety and protect wildlife. Collecting data on the extent and nature of WVC incidents is a challenge, however. Currently, Caltrans maintenance staff record their activities on paper in the field and then transcribe that information to a digital system when they return to the maintenance stations and regional offices. This system not only makes it challenging for individual staff to keep track of activities, it also reduces the chance that valuable information (like WVC location and wildlife species) will be retained and transcribed correctly.

To improve data collection, the Road Ecology Center at UC Davis is developing tools such as a “one click” mobile app which will help Caltrans workers and others to collect WVC data in the field, with greater locational accuracy.

The app will also enable Caltrans maintenance staff, who are often first responders to non-emergency roadside incidents, to track illegal dumping and as well as record roadside vegetation issues (e.g., areas that need mowing, weed-control, planting) and note fire hazards.

### Solution

The Road Ecology Center has developed a smartphone application as a first step to putting a set of critical and contemporary reporting tools in the hands of the approximately 5,000 Caltrans Maintenance Division staff who clean up trash, collect wildlife carcasses, and manage the roadside along more than 12,000 miles of state highways. Eventually, the app and the system behind it will help both with finding hotspots of wildlife carcasses resulting from collisions and with carrying out other cleanup and maintenance activities (e.g., weed-management, trash cleanup) critical to improving state highway rights of way.



**Figure 1. User-submitted photo from the California Roadkill Observation System.**

### KEY TAKEAWAYS

- Wildlife-vehicle collisions (WVC) pose a risk to drivers and annually costs billions of dollars annually.
- One of the greatest hurdles in reducing wildlife-vehicle collisions is collecting data on the extent and nature of the incidents.
- The Road Ecology Center developed an easy-to-use smartphone application that streamlines wildlife-vehicle collision reporting for Caltrans Maintenance Division staff who maintain 12,000 miles of state highways.

## Application Architecture

Our objective was to make the app as easy to use as possible. The “one click” app supports Apple iOS and Android based smartphones and tablets, making it cross platform. Below is a simplified model of the system architecture.

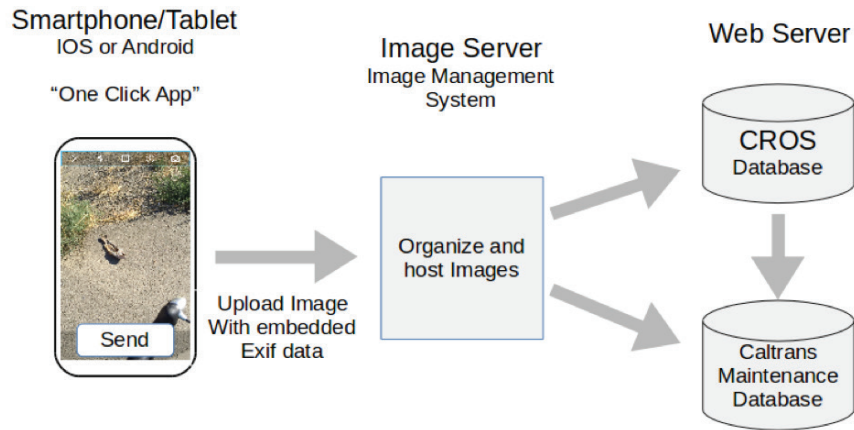


Figure 2. Simplified model of the system architecture for the “one click” application

The “one click” app allows the user to snap a picture using the tablet/phone’s camera, which is then sent automatically to an image management server. The device’s location (where the photo was captured) and the date/time are stored with the picture, and sent to a server, where the photo’s Exif data are stored. Users can “tag” the incoming photos with important information, such as the animal’s species, to populate the core data for reducing WVC. These images can then be imported into other Caltrans tools such as the California Roadkill Observation System (CROS) and Caltrans Maintenance Database (not currently developed).

The tools developed will have several verification steps built into the workflow to filter out unwanted photos, prevent unregistered users from posting, and maintain images with consistent embedded content.

## Conclusion

This application framework will enable Caltrans staff and partners to collect information on roadside features and document their findings in a web-based database. These data are critical for identifying wildlife hotspots and for mitigating impacts to drivers and animals from collisions.

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