



UTC Spotlight

University Transportation Centers Program

This month: Montana State University | March 2012

Researchers Develop Handheld Tool to Collect and Map Wildlife-Vehicle Collision Data



WTI/MSU

An integrated PDA-GPS handheld data collector developed for the ROCS project.

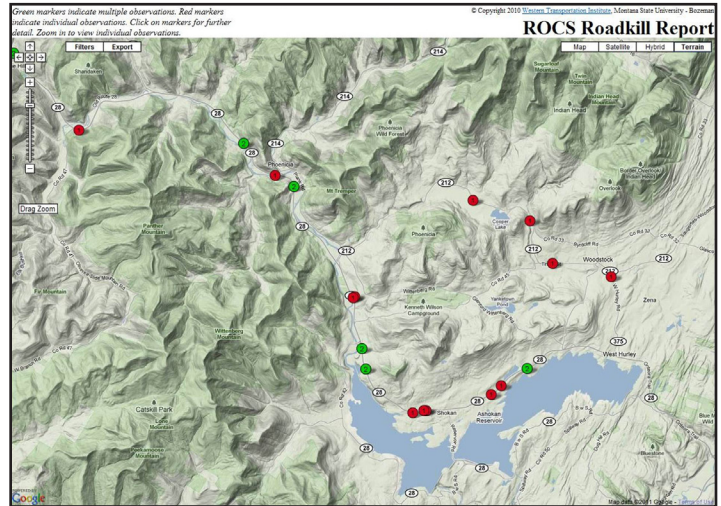
Thanks to ongoing support from the UTC program and other partners, Western Transportation Institute (WTI) researchers at Montana State University have created a fully functional tool that makes it easy for road crews to collect accurate information about wildlife-vehicle collisions (WVCs). For transportation and resource agencies, the immediate benefits include identification of high risk road segments, access to information

that supports mitigation efforts, and the availability of paperless reporting options. If widely deployed, the tool has the potential to increase the collection and cross-jurisdictional sharing of standardized, accurate WVC data across North America. Over the long-term, this may produce broad benefits, including enhanced safety for travelers, preservation of wildlife and their habitats, and targeted initiatives to protect endangered species.

The Value of Accurate WVC Data

Wildlife-vehicle collisions (WVCs) affect human safety, cause property loss, and kill or injure wildlife. The number of crashes between cars and large mammals has increased by an estimated 50% in the past two decades, totaling one to two million per year in the United States alone.

The systematic collection of WVC data helps quantify the magnitude of the problem and monitor changes over time. Such data also allows agencies to identify and prioritize locations that require mitigation efforts, such as signage, wildlife fencing, or crossing structures, and to evaluate the effectiveness of these interventions in reducing the number of WVCs.



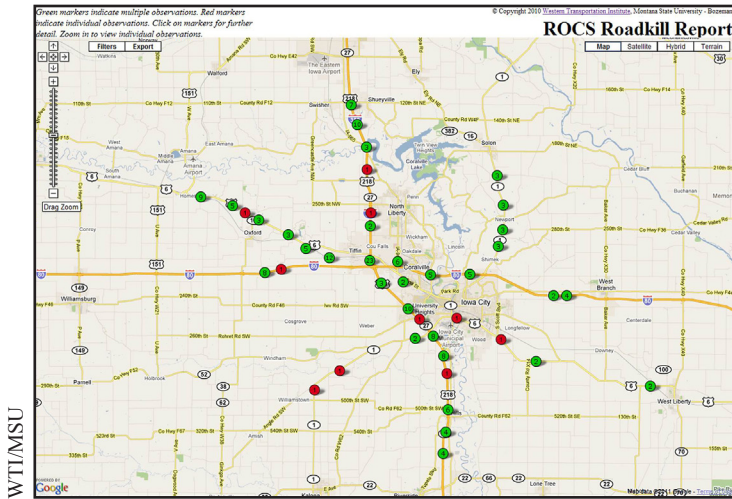
WTI/MSU

Screen Shot. ROCS Roadkill report website viewing data under "terrain" mode in the Catskill Mountains of New York. Users can click on the markers for more information about the individual observations. (Credit: WTI/MSU)

Many departments of transportation and departments of natural resources collect wildlife mortality data. However, researchers have found that the usefulness of these data are limited by lack of spatial accuracy and standardization. Moreover, despite advancements in information technologies, most data on WVCs are still collected, often sporadically, with pen and paper.

Development of the Roadkill Observation Collection System (ROCS)

Since 2005, WTI has been working with the Federal Highway Administration (FHWA) and 12 state departments of transportation to develop a WVC data collection tool that is spatially accurate, efficient, paperless, and easy to use. The Roadkill Observation Collection System (ROCS) integrates a handheld computer or personal digital assistant (PDA) with a global positioning system (GPS) supported by customized software, which field personnel can use to document information such as the collision location and the species of wildlife.



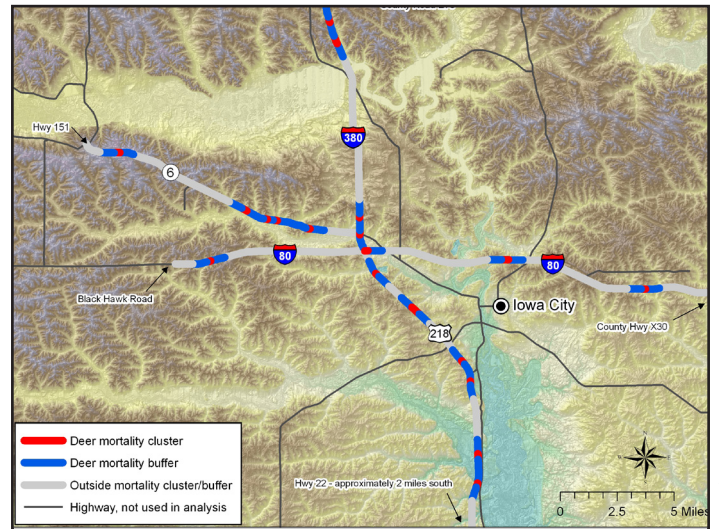
Iowa roadkill data viewed via Google Maps® at the ROCS Roadkill Report website. Users can click on the markers for more information about the individual observations.

In the initial project phase, WTI road ecology and systems engineering researchers worked together to create and field test a successful proof-of-concept system, including an easy to use interface that facilitated rapid data entry. In Phase II, researchers developed practical modifications and customization of the software and hardware. The refined system was a rugged, waterproof, dust resistant PDA field unit with an integrated GPS.

WTI recently completed a third phase of research, which achieved goals related to managing, sharing, visualizing, and analyzing the data. New components include an internet-based means of storage and retrieval of data, and desktop software (via a browser interface) to place data on maps or download data to programs for analysis.

Sponsors of Phase III included both the FHWA, and the Deer Vehicle Crash Information and Research Center (DVCIRC), which is a 10-state pooled fund study. Two members of the DVCIRC (New York and Iowa) volunteered to test the system during 2010 and 2011.

These field tests demonstrated that ROCS' data collection, transfer, and storage capabilities are fully functional. For example, the data collected by Iowa personnel was automatically transferred to the central database upon connecting the PDA-GPS units to an Internet-connected PC. The database was then used to generate a range of reports and maps that integrated and displayed the information. Users also have the option to download the data to their own software programs for other types of analysis. Researchers were able to demonstrate how the data could be used to identify "deer road mortality clusters" on road segments or to conduct cost-benefit analyses on potential mitigation measures.



Deer mortality clusters and buffer zones along five road sections in and around Iowa City. The clusters were identified using ROCS data.

WTI is pursuing efforts to facilitate broader deployment, including development of a smart-phone version of the system. For field crews who already have smart phones, a ROCS application would reduce the necessity and costs of obtaining additional PDA-GPS units.

About This Project

ROCS is a collaborative, multidisciplinary project led by Robert Ament (M.Sc., Biology), Program Manager for Road Ecology; and Douglas Galarus (M.Sc., Computer Science), Program Manager for Systems Engineering, Development, and Integration. Daniell Richter (B.S., Computer Science), Kelvin Bateman (B.S., Computer Science), Marcel Huijser (Ph.D., Wildlife Ecology) and James Begley (M.Sc., Resource Management) also contributed to this project. More information on ROCS is available at <http://www.westerntransportationinstitute.org/research/4W1824.aspx>.

The director of WTI is Stephen Albert (M.S., Urban and Regional Planning); to learn more about this National University Transportation Center, go to <http://www.westerntransportationinstitute.org/>

This newsletter highlights some recent accomplishments and products from one University Transportation Center (UTC). The views presented are those of the authors and not necessarily the views of the Research and Innovative Technology Administration or the U.S. Department of Transportation, which administers the UTC program.

