

focus on

rural highway safety

Reducing crashes at rural intersections

CAN intelligent transportation systems (ITS)—which are already transforming metropolitan highway safety programs—enhance safety on Iowa's rural roads?

The University of Minnesota is studying the effectiveness of a rural ITS application that could be useful in Iowa.

Driver error at rural intersections

Iowa's network of two-lane rural highways and collector roads connecting small cities and towns accounts for the majority of the state's road miles. Nationally, the highest crash fatality rates occur on just such roads.

Many rural crashes occur where highways and collector roads intersect. The most common driver error involved in rural intersection crashes is the failure to correctly gauge how much of a gap in traffic is needed to safely cross or merge from a side road onto a highway.

The traditional "fix" for high-crash rural intersections, according to Max Donath, director of the University of Minnesota's Intelligent Transportation Systems Institute, has been to install a standard traffic signal. But, says Donath, conventional signals do not necessarily reduce fatalities in these situations.

In fact, traditional signals often increase the number of rear-end collisions at rural intersections.

Signals also disrupt traffic on the main highway, a significant issue in rural areas where highways are heavily used by large commercial vehicles that take a long time to reach highway speed after stopping.

Helping drivers decide

The ITS Institute is developing an Intersection Decision Support (IDS) system that could enhance drivers' ability to safely negotiate unsignalized rural

intersections where low-volume roads cross highways carrying high-speed traffic.

The IDS system consists of four components:

- **Surveillance.** A network of radar sensors adjacent to the roadway monitor the position and speed of vehicles on the highway approaching the intersection.
- **Communications.** Each radar sensor station sends vehicle speed and position data to a central processing unit.
- **Processing.** Based on the data collected, the CPU tracks gaps between vehicles on the main highway and predicts if gaps are sufficient to allow vehicles stopped on a secondary road to cross the highway or merge into traffic safely.
- **Driver interface.** A graphic display alerts drivers on the crossing road when it is not safe to cross or merge. (Drivers on the main highway see no display or signal.)

What's next?

The IDS system researchers, led by Donath at the ITS Institute, have carried out several demonstrations of the system, including one of a working installation on a closed traffic course.

The next step is to implement and study a working system at selected intersections. Stay tuned.

For more information

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