

TECH NEWS

TECHNOLOGY NEWS

September-October 2004

Protecting Iowa's covered bridges

In 2002 Madison County's Cedar Bridge, one of the county's historic covered bridges and the only one still open to vehicles, was destroyed by arson. In 2003, a covered bridge near Delta in Keokuk County was destroyed by arson, and another Madison County bridge, the Hogback Bridge, was damaged by fire.

How can we prevent future destruction? Iowa State University's Bridge Engineering Center (BEC) may have a way.

Bridge monitoring system

Through a grant from the U.S. Department of Agriculture Forest Service's Forest Products Laboratory, the BEC is developing a remote monitoring system that will ensure the long-term preservation of historic bridges. Once the system is in place, authorities will be alerted in real time to possible acts of vandalism or arson.

The system will include at least three sensing systems:

- Fiber-optic Fiber Bragg Gratings (FBG) will monitor changes in temperature throughout the bridge. The FBG sensors will be strategically placed to detect sudden, abnormal changes in temperature to identify arson attempts.
- Thermographic infrared cameras, which measure infrared energy, will monitor any rapid structural temperature changes due to fire as well as the presence of people on the bridge during restricted times—in other words, potential vandals and/or arsonists.
- Web-based video cameras will continuously watch and record suspicious activity and potentially serve as a deterrent to would-be vandals and arsonists.

Beta test

BEC Director Terry Wipf and Associate Director Brent Phares will work with the bridge owners, law enforcement, and other interested parties to identify the vulnerabilities of Madison County's covered bridges. They'll design, construct, and beta-test a monitoring system and then install it on at least one covered bridge.

The system will be connected to the Internet and made available to the public for viewing. To test the system's functionality, Wipf and Phares will arrange with law enforcement to conduct mock attacks of vandalism and arson.

Implications

Arson and vandalism are not the only potential threats to bridges, of course, in the post-September 11 world. This research may well have far-reaching implications in remote monitoring for bridge security.

For more information

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