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In a Road That's All Eyes, the Driver Finds an Ally

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Other features followed. Optical systems inside the casing are able to monitor the atmosphere for fog. Electrical resistance detectors can check for standing water. The addition of a thermometer allows the marker to predict ice.

But getting high-resolution digital cameras into the flush-mounted housings was a more difficult task. It ultimately required the development of a special series of lenses that in effect allowed the camera to look upward and forward from its subsurface location.

The cameras (the system can use either normal or infrared sensors) provide remarkably detailed images, according to Mr. Dicks. "You can clearly see everything underneath a vehicle, although I'm not sure why you'd want to do that," he said.

The police, however, are likely to be interested in seeing the license plates of vehicles traveling above the speed limit or through red lights. To that end, Astucia has developed a system that is operating on a highway in Scotland. It employs three embedded cameras to give front, rear and side views of passing vehicles. Other embedded sensors project two infrared beams over the road that are used to time traffic and determine its speed. The images and the speed data travel under the road by cable to a computer. It in turn relays the data by satellite to Astucia's offices.



The system is currently being used to monitor traffic slowdowns. When it detects them, it turns on illuminated markers farther up the road as a warning. Mr. Dicks said that its speed measurements were accurate within 0.5 percent, well within the tolerances demanded for traffic enforcement.

Similarly, he said, the systems can be combined with optical character recognition software to automatically track stolen vehicles or cars believed to be used by suspected criminals or terrorists.







Mary Ann Smith

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The United States branch of Astucia began demonstrating the camera system - which costs about \$50,000 for a package of three cameras, sensors and supporting electronics - to police and highway officials less than a month ago. John Kerridge, the subsidiary's president, reported considerable interest in the system for both traffic and broader law enforcement. But he added that public resistance could be one obstacle to its adoption.

"We all break the law regarding speeding," Mr. Kerridge said. "The system may leave a bad taste in motorists' mouths at the beginning. But when their insurance starts going down and stolen vehicles start getting recovered, the benefits will overcome that."

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