

Electronic Vehicle Registration Picks Up Speed

A number of nations are using passive RFID tags to automatically verify cars are properly registered, as well as to monitor traffic levels.

By Beth Bacheldor

Feb. 28, 2008—In South Africa, at least 500,000 RFID-enabled decals are now being affixed to windshields to automatically identify vehicles and verify they are properly registered. Within the next two years, 10 million cars in that country are expected to sport the decals.

In Bermuda, meanwhile, more than half of the island nation's cars and trucks currently have the RFID-enabled decals, and all of its trucks and cars—nearly 25,000—are expected to have them by June of this year. Other countries—including Brazil, China, Dubai, India and Mexico—have either already begun implementing or are currently eyeing RFID-enabled vehicle identification and registration systems.

Such systems, known as electronic vehicle registration (EVR) or electronic vehicle identification (EVI), leverage passive RFID transponders—typically ultrahigh-frequency (UHF)—embedded in decals affixed to windshields or other parts of a vehicle. Fixed RFID interrogators installed at main traffic intersections or alongside roads, as well as handheld readers for use during traffic stops, can read the tags' unique ID numbers and then compare them with information in a back-end database to determine, for instance, who owns the vehicle, whether it is insured and if registration is up-to-date and taxes and fees are paid up. In addition, tag reads collected over a period of time can help municipalities better understand traffic patterns and flow.

IPICO is among the companies offering an RFID-based EVI system. The use of such systems, according to John Greaves, IPICO's VP, "really is bursting into public view now, and we [IPICO] are regularly becoming part of the dialogue with government agencies, particularly those in developing nations." Greaves says vehicle management is an increasing challenge in developing countries, noting, "Here are countries where you can find instances where police in rural areas don't have any ability to validate whether the owner of a car is legal."

Steve Baumhardt, VP of business development at TransCore, agrees. Without an easy and accurate way to confirm a vehicle's legality, Baumhardt says, nations are shortchanging themselves. "Many countries are losing a great deal of revenue due to noncompliance," he explains, "because they aren't collecting the taxes for registration. This is a problem in many cases that drives the interest in EVR."

Such was a motivating factor in Bermuda's EVR implementation. The nation loses an estimated \$11 million every five years due to its inability to enforce licensing requirements. Bermuda's Transport Control Department has been working with TransCore and 3M's Traffic Safety Systems Division to deploy an EVR system that employs TransCore's RFID readers and passive UHF tags, which carry only a unique ID and comply with the ISO 18000-6B standard (see Bermuda's RFID Vehicle Registration System Could Save \$2 Million/Year).

Another potential benefit of deploying EVR and EVI systems is their ability to count the number of cars that

drive on a particular roadway during a specified period of time. Many cities worldwide have increasing levels of traffic, but were not designed to accommodate vehicles. Greaves cites the highly congested roads in Asian cities, noting, "The minute you see vehicles start to proliferate there, the minute you see urban gridlock."

Last summer, the China Academy of Transportation Sciences (CNATS) signed an exclusive distribution agreement with IPICO for its Electronic Vehicle Toll and Management solution. China's highway system is rapidly expanding—80,000 kilometers (50,000 miles) of new highways are slated for construction by 2010, IPICO says, with the total reaching 150,000 kilometers (93,000 miles) by 2020.

According to IPICO, the new roads will be massive in width. "There are highways in China that are four times as wide as anything you've seen in California," Greaves says. "There are 16 lanes going in each direction." EVR systems such as IPICO's will help the country determine how to build the most efficient highway system, because it can use the tag reads to determine traffic flow and traffic patterns. Now you can get into things like managing whole streets with RFID. If the system tracks that there are too many cars in a particular street, for example, barriers can be triggered to go down, stopping cars from going onto that street, until traffic thins out. Cities will be able to manage traffic streams and traffic velocity."

Still missing with regard to EVR and EVI systems, however, are internationally agreed-upon standards. The ISO 24535 standard, created for basic electronic vehicle registration applications, details only basic functionality, such as sticker tag format, the ability to read and write the tag, and requirements for the amount of data storage and security. But that standard does not define, for example, an air-interface protocol that would describe how tags and readers should communicate.

That said, several regions and countries are adopting their own standards. In January, the South African Bureau of Standards formally published SANS 24535, a framework for electronic registration and identification of vehicles using passive UHF RFID, and SANS 504, which defines parameters for unidirectional air-interface communication of RFID systems. IPICO's IP-X based UHF RFID technology complies with these recently announced standards.

The primary focus of the SANS 24535 standard is to describe a variety of RFID reader-tag scenarios necessary to support deployment of passive UHF RFID. These include requirements for electronic tag registration, for interrogators used during tag registration and for interrogators limited to reading the tags and verifying, or checking, each tag number against associated data. The standard describes the specifications for implementing fixed readers deployed along public roads, as well as for mobile interrogators used by law enforcement officials. SANS 24535 is based on, and supports, ISO 24535.

RELATED_ARTICLES The United States does not currently have any specific efforts underway to define standards for EVR and EVI systems. One problem the country faces is a legacy of vehicle registration processes and systems that vary from state to state. "Just look at license plates here," Greaves states. "Can you show me a standard? There are different numbering systems in Massachusetts than in Virginia. So right away, you have a difference in data content. It is interesting to note that [U.S. vehicle registration] initiatives and processes date from the 1930s. In other countries, because they don't have the burden of legacy systems, they do not have a state and federal infrastructure that can't be re-engineered."

Consequently, experts predict that EVR and EVI system will be adopted more widely elsewhere than in the United States. "In other parts of the world," Baumhardt explains, "decisions are often made nationally and are federally mandated. In the U.S., of course, it is the individual states that determine vehicle requirements."