

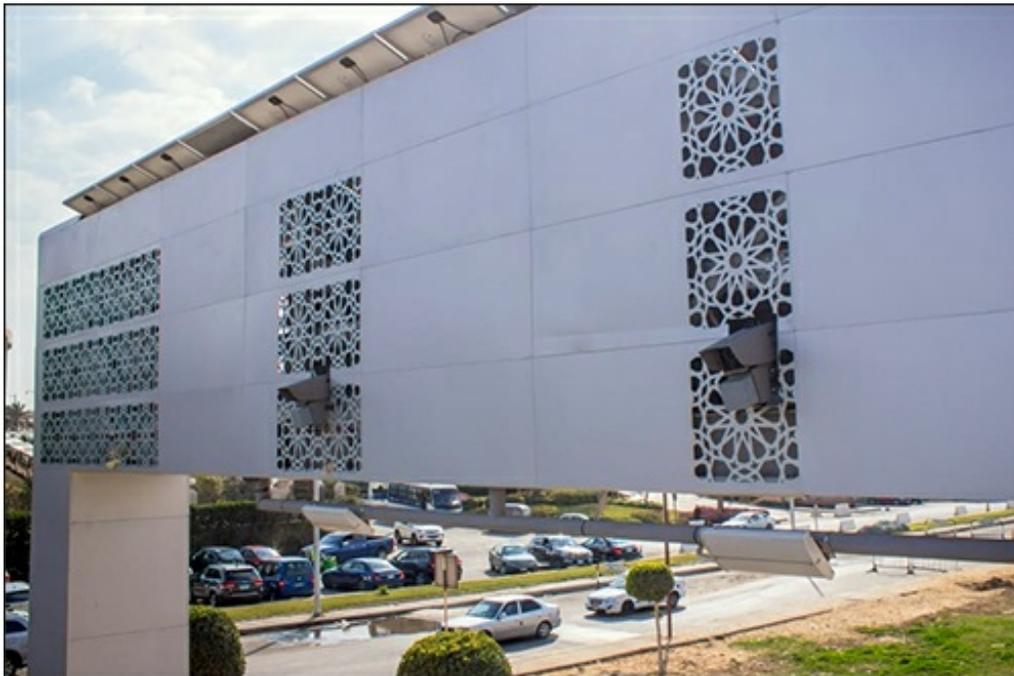
The country's Ministry of Interior is deploying an RFID solution from Go+, using technology from Kathrein Solutions, in cooperation with Wireless Dynamics, to track the nation's registered vehicles as they travel highways and city roads,

By Claire Swedberg

Tags: [Automotive](#), [Asset Tracking](#)

Nov 27, 2019—Egypt's Ministry of Interior (MOI) plans to identify millions of vehicles as they travel on the country's roads, using an RFID solution from [Go+](#), with hardware and software provided by [Kathrein Solutions](#) in cooperation with [Wireless Dynamics](#). The system, which will be implemented across approximately 10 million of the country's vehicles throughout the next five years, consists of passive UHF RFID stickers attached to each car's windshield, as well as tags on headlamps that respond to interrogation from readers installed above roadways, even at high speeds.

The nation of Egypt faces a growing challenge related to traffic and the management of all cars operating on its roadways. Some vehicles are unregistered, while others may have been cited for traffic violations and should not be on the roads at all. The MOI sought a way to understand the traffic issues on its roadways, especially around the city of Cairo, and to detect when vehicles were being operated that shouldn't be.



The main challenge was to implement a cutting-edge RFID technology that has never been deployed in the region before, says Hesham El Sayed, Go+'s chairman, "and to maintain the highest level of security and data integrity without reducing the [RFID read] performance." Go+, a logistical support services company, was launched in 2013. The Egyptian company provides a range of logistical services, El Sayed explains, including RFID solutions. Kathrein is providing the hardware and CrossTalk software for the solution in cooperation with Wireless Dynamics, which helped to install the hardware.

"For many years, Kathrein Solutions has had quite a large footprint in Egypt," says Christian Schnebinger, the company's senior sales manager for intelligent transportation systems. The firm has already taken part in several smaller vehicle-identification and toll-collection projects in Egypt. As a result, he says, "our products are present in everyday life in the country." As part of a pilot, Kathrein provided 5,000 transponders that were attached to select vehicles in order to help the MOI identify them on the nation's highways.

The pilot involved four readers and 16 antennas installed on overhead gantries on multiple-lane highways, which read tags as vehicles travelled by highway speeds. Early in 2018, Kathrein began working with Go+ and Wireless Dynamics to provide the full solution that is now being expanded to all vehicles. To date, the companies have installed readers on 60 gantries in Cairo and the

surrounding area.

The solution consists of multi-lane highways on which vehicles free-flow at high speeds, as well as areas in which cars may slow or stop. "It will be quite a mixture," Schnebinger states. Kathrein ARU 3500 readers with integrated antenna are installed with automated number plate recognition (ANPR) cameras, as well as Go+'s solution with solar-power panels to energize the readers and cameras. Typically, two antennas are deployed with each reader.

The vehicle tags come with NXP UCDE DNA chips that support up to two 128-bit AES authentication keys. Cryptographic keys can be used for tag authentication, as well as for privacy protection. "The government chose the highest possible security level, based on NXP's UCODE DNA IC," Schnebinger states. Although the use of a secure transmission takes longer than a standard EPC RFID tag read, he notes, "With our setup, we ensured a constantly reliable reading performance."



Christian
Schnebinger

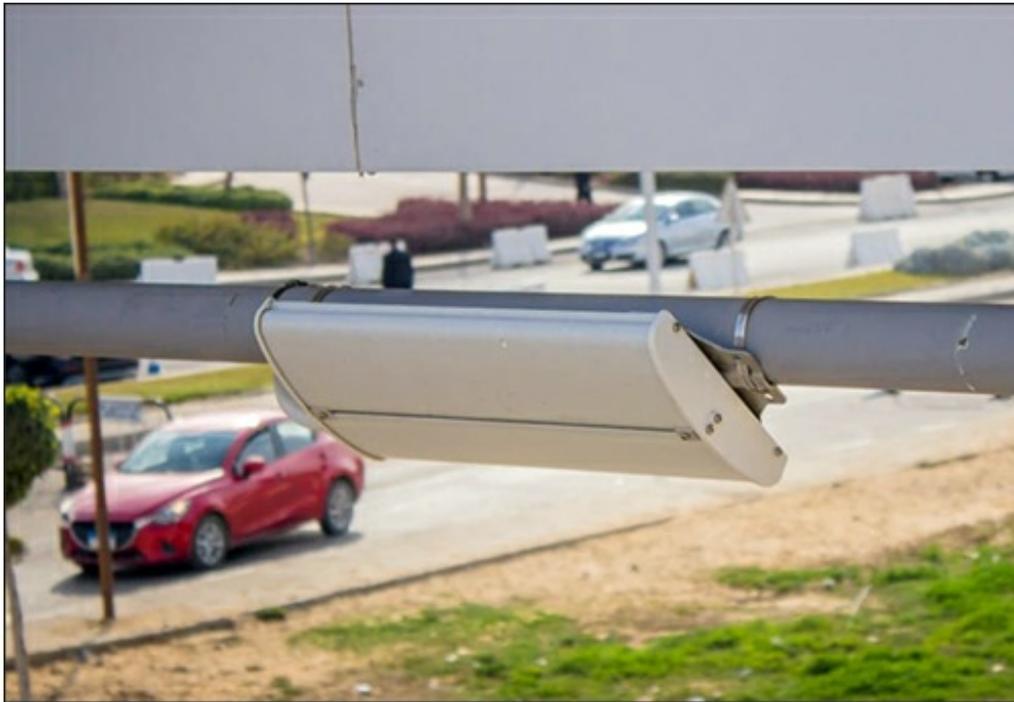
According to Schnebinger, the tags can accomplish reads at highway speeds. "During our internal tests at [Sachensing Race Circuit](#)," he says, "we have achieved reliable readings at a maximum speed of 220 kilometers per hour for a 4-wheeler, and approximately 240 kilometers per hour for motorcycles," while using the full 128-bit AES encryption, TAM2 (see [RFID Breaks Speed Records for Tolling Solution](#)). "The reading distance of the tags is 15 to 20 meters," he adds, "depending on the surrounding conditions."

The deployment is rolling out in multiple phases, with the first phase aimed at tagging 10 million of the nation's vehicles. To date, around five million tags have been deployed and are being tracked on Egypt's roadways. The tags are attached to each vehicle and are commissioned as an operator brings it in for vehicle registration or renewal.

During the electronic vehicle registration process, Go+'s staff or agency officials check the tag's location for each vehicle, then apply the transponder accordingly. There are three areas on the windshield at which tags can be applied, depending on whether the cars have metalized windows or heating systems. The tag's unique ID number is entered into the Go+ software and is linked to the vehicle's information. The system then forwards that data to the MOI database.

Next, the driver proceeds to operate the vehicle on public streets. Each time that vehicle passes a reader, the device captures its tag ID. Go+ software structures the data, encrypts it and transports it to the dedicated, cloud-based central data center, El Sayed explains. Go+ used Kathrein's JAVA-based software developers kit (SDK) to create its roadside software to capture and manage the RFID data.

The system can identify not only the vehicle and the speed at which it is travelling, but also the lane it is in. Kathrein's RRU 4500 reader, together with its wide-range 30-degree antenna, ensures lane-selective identification of each vehicle. In addition, the camera mounted with each reader provides vehicle license plate images that are transmitted to the back end via an interface, together with the RFID data. The information is being used for two purposes: to track the flow of traffic and to identify vehicles for law enforcement. For traffic flow, El Sayed says, the data can help the MOI to plan its roadwork projects.



"The system provides the agency with accurate, digital and live data in order to control traffic flow and minimize illegal activities," El Sayed states. A third goal is to track vehicles' speed. With the data, law enforcement could potentially identify which vehicles are traveling at excessive speeds.

The tags are designed to be tamperproof, in order to prevent individuals from removing them from vehicles or replacing them. If anyone tries to peel a tag off a windshield, it will no longer operate properly. Go+ is also in discussions with four other countries about the possibility of implementing this solution once the Egyptian system is fully deployed.