

Automatic License Plate Recognition Systems Emerge as a Law Enforcement Tool

Office of Law Enforcement Technology Commercialization (OLETC)
by Tim McFadden



Automatic license plate recognition systems are emerging as a vital law enforcement tool in the United States. Advances in technical abilities of the devices, coupled with a new availability of data, have spurred a flood of activity in this field. Vendors are developing systems with new features that will not only find stolen vehicles, but will help in Amber Alerts, border security, and even assist law enforcement in protecting children from predators.

Sgt. George Jacobs of the Maryland State Police heads the 34-officer Washington Area Vehicle Enforcement Unit (WAVE). The WAVE unit is a multi-jurisdictional task-force that conducts auto-theft operations in Washington, DC and Prince George's County, Maryland. Jacob's unit has field-tested systems from five different vendors. They are in the process of purchasing three systems from one of the vendors. Sgt. Jacobs believes that the automatic license plate recognition systems are an essential tool for auto theft investigators. Ac-

ording to Jacobs, "We recovered 8 cars, found 12 stolen plates, and made 3 arrests in just one shift while field-testing the equipment." An important advantage to the new technology, says Jacobs, is that it does not discriminate. He goes on to say, "When we read the plates of all passing vehicles we are not profiling. The system only alerts us if the vehicle is stolen."

Automatic license plate recognition systems typically follow a several step process. The devices use infrared light to illuminate a plate. Infrared offers the advantage of working well in dark conditions. A high speed camera then takes a photograph of the plate. The photograph is analyzed using software and the images are converted into digital letters and numbers. The resulting string of letters

and numbers is then compared with a database. When a match is found, an alert is provided and law enforcement officers respond accordingly.

Older systems needed a trigger mechanism to start the process. New automatic license plate recognition systems continuously take photographs and analyze them for the presence of a license plate. This allows the systems to run in the background without any action by the officer.

Law enforcement agencies in Europe have used automatic license plate recognition technologies for years. The long rectangular shape of their license plates coupled with contrasting black letters over a white background make the plates technically easier to read than plates in the United States. Some early uses of the systems in the United States have included toll-booths, parking, and traffic studies and building security.

In 2004, the FBI's National Crime Information Center (NCIC) created a process where agencies could receive a data extract of stolen vehicles, stolen plates, and wanted individuals for use with automatic license plate recognition systems. The NCIC extracts the data in the middle of the night and electronically forwards it to agencies under a memorandum of understanding. The data can be easily forwarded as an email attachment. The data is then saved on a jump drive which is then plugged in to the device. The advantage to this method is that it allows each system to run thousands of plates in a single shift. In fact, some agencies have run

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nearly 10,000 tags in one shift using the systems. The disadvantage to this method is that the data is static from the time of the extract. Therefore, if a system were to encounter a vehicle that was stolen after the data extract, it would not alert. This availability of data is an essential component to these systems.

There are many potential law enforcement uses for automatic license plate recognition systems. One obvious use is to combat the \$8 billion a year auto theft problem in the United States. The Pennsylvania Auto Theft Authority administers an insurance funded program that supports auto theft units in Pennsylvania. Roy Miller is the director of the Authority. According to Miller, “Law enforcement is very excited about this technology. In all instances when they go out to test this technology they are coming back with hits. This technology is going to knock auto thieves on their heels. Technologically, this stuff is ready, it is not prototypes, it actually works.”

Another law enforcement application of the technology is to assist police in locating individuals in prohibited areas based on a court order. Convicted sexual predators may be prohibited from being within a certain distance from a school. Automatic license plate recognition systems can have integrated GPS abilities whereby an alert would be issued should a license plate associated with the convicted individual enter the restricted area. A similar application could be used for domestic orders prohibiting an individual from coming within a certain distance from a residence. When the license plate images and GPS records are saved, the information could be subsequently mined to create a list of potential witnesses and suspects that were in a particular area when a crime occurred.

Automatic license plate recognition can be configured as fixed, mobile, or covert units. Fixed units are typically deployed at toll booths or mounted on highway overpasses. Mobile devices can be handheld, mounted on car roofs, or mounted on light bars. Covert units may be hidden in speed trailers, traffic barrels, or even traffic lights.

Law enforcement agencies that are considering purchasing systems should consider the vehicle that they plan to use with the system,

their desire to maintain or analyze data, and the planned frequency of use. Certain systems require permanent mounting on vehicles. If a vehicle cannot be dedicated for use with the system, a portable unit should be considered. Additionally, certain systems have the ability to retain data for subsequent analysis. Agencies should consider their desire to maintain and analyze data when making acquisition decisions. Finally, smaller agencies that do not plan to use the systems frequently may want to consider sharing the equipment with other agencies.

The following table displays some of the U.S. providers of automatic license plate recognition systems:

Company	Product
Civica http://www.platescan.com/	Platescan™
DataWorks Plus http://www.digitalcrimescene.com/tagnabit.htm	TAG-NABIT
Extreme CCTV http://www.extremecctv.com/home.cfm	REG – RX-M1™
G2Tactics http://www.g2tactics.com/	GLAVID™
Remington Elsag http://www.remington-elsag.com/	Mobile Plate Hunter

Major challenges to the technology include state differentiation, variances in state plate backgrounds and fonts, and obstructions. Currently available systems do not distinguish between states. Therefore, if a system encounters a string of letters and numbers that are wanted in one state on another state’s plate, the system will alert. Common vanity plates such as “HELLO” or “GOODBYE” are especially susceptible to this problem. Officers using automatic license plate recognition systems should always confirm alerts before acting. Stacked characters such as those typically found on affinity plates also pose a problem for the systems. Obstructions such as trailer hitches, ice

and snow, and plate covers also pose a problem for systems. Generally, if a person cannot see the numbers and letters on a plate, the system will not be able to read them either.

In the future automatic license plate recognition systems should become more affordable as more departments adopt the technology. Sgt. Jacobs believes that the systems will eventually be integrated in patrol units as the prices decline. He states that, “once in patrol units the systems can be loaded with information about suspended drivers and will be very effective in keeping them off the road.” Data availability, timeliness, content and transfer methods should also improve.

Departmental policy regarding the maintaining and mining data will continue to be an issue.

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