

Maryland's Pursuit of the Paperless Patrol Car: Using Mobile Technology to Foster Interagency Collaboration and Improve Officer Safety

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In today's information age, it can be difficult to remember how people got by before the Internet existed. For decades, it was standard practice to wait for the morning newspaper to check box scores and to rely on handwritten letters to stay in touch with friends. After 15 years, the Internet has changed the daily lives of many in profound ways that would have been hard to fathom at its outset.

The same can be said for mobile technology in the law enforcement profession. Fifteen years ago, it was a rarity to find a computer inside a police car; now it is hard for most officers to work without one. Notebook computers mounted in police vehicles have also spawned numerous supporting hardware and software applications that have changed the nature of police work, such as computer-aided dispatch (CAD) systems, digital in-car video, license plate recognition technology, and Global Positioning System (GPS) tracking.

Identifying Applications for Mobile Technology

When the Office of Technology Management at the Maryland State Police (MSP) deployed its first notebook computers in patrol vehicles in 2004, it identified a specific set of applications and tasks that would help officers perform their jobs better, such as completing reports from the field. The ability to identify the total cost of ownership was an important factor in the office's original decision, but, at that time, the MSP could only estimate the value derived through time savings and improved communication. Officer safety was also a primary goal, addressed primarily through the placement of equipment and the selection of proper docks out of the path of airbag deployment.

Just five years after that initial deployment, the MSP has seen firsthand how mobile technology can not only expedite its everyday processes but also foster better relationships with partner agencies and create a safer working environment in ways that were unimaginable before. And, although mobile technology is prevalent in the law enforcement community today, many agencies can learn from the MSP's experience in identifying new applications and building strong partnerships to ensure the benefits are realized beyond their own jurisdictions.

Changing the Law for E-citations

In the fall of 2006, MSP Sergeant Douglas Baralo and Corporal Christopher Corea, assigned to the Office of Technology Management, had an in-depth discussion about

mobile technology. Although their patrol troopers had access to state-of-the-art mobile computers, there were still a number of functions that had yet to be automated. The primary activity for many patrol troopers was stopping traffic violators, but the bulk of troopers' time was spent writing tickets with a pen and paper.



Figure 1. Corporal Chris Corea of the Maryland StatePolice uses the E-TIX system while on a traffic stop. Photo by Robert Severi

That discussion inspired Corea to develop a prototype of an electronic citation (or e-citation) system that weekend. He called his creation the Electronic Traffic Information Exchange (E-TIX). After Baralo saw the prototype, the two troopers recognized the value of the idea and began selling it up the chain of command. The concept was well received, but the troopers soon learned that a significant barrier stood in their way: Maryland state law prevented police agencies from issuing e-citations.

At that time, every traffic violator was required by law to sign a paper citation, and each citation was permitted to contain only one charge. That meant officers were spending a lot of time on each traffic stop, especially when there were multiple violations. Furthermore, although it is a worthy objective to make officers more productive, it was far from the primary concern the MSP had with long traffic stops: officer safety.

As many police officers know, one of the most dangerous and overlooked factors for officers during traffic stops is their exposure to other cars driving past the scene. During the 10 years from 1997 to 2006, 46 officers were fatally struck by passing vehicles while out of their patrol cars on traffic stops.¹ Therefore, the less time officers need to remain on the side of the road writing a citation, the safer they will be.

With this in mind, the MSP spearheaded a campaign to change the law that had prevented the issuance of e-citations by working closely with the District Court of Maryland. Sergeant Baralo and Corporal Corea conducted numerous E-TIX presentations for various stakeholders to build a strong consensus, winning support from a diverse group of organizations, including the State Highway Administration, the State's Attorney's Association, and the Maryland Judiciary. Even public defenders at the Maryland Defense Council provided support, recognizing that fewer people would be arrested for the simple reason of failing to sign their traffic citations.

Legislation was soon drafted and formally submitted to the Maryland House and Senate. Baralo and Corea were given an opportunity to present the E-TIX system to the House Judiciary Committee and the Senate Judicial Proceedings Committee prior to the start of the 2007 legislative session. The result was overwhelmingly positive: the measure was passed unanimously in both houses and was signed by Governor Martin O'Malley in May 2007. The new law permitted electronic citations, allowed multiple charges to be issued on one document, and eliminated the need for the violator to sign the citation.

Getting E-TIX off the Ground

After the law went into effect in August 2007, a grant-funded E-TIX pilot program started

with 15 troopers who entered all citation data into the system. Citations were still issued on paper, and warnings were issued electronically. The pilot program was very successful, and additional agencies continued to join.

During the pilot, the MSP continued its partnership with the District Court of Maryland to validate the process of transferring data between their servers. During the seven months of the pilot program, 15,000 traffic violations were entered into the system and were successfully transferred to the District Court.

Finally, in March 2008, E-TIX was granted full certification by Chief Judge Ben Clyburn of the District Court of Maryland. This certification allowed the MSP to submit electronic data, rather than paper forms, to the court system for the first time.

How Officers use E-TIX

The significant benefits of E-TIX became clear to the MSP soon after the system went live. Each step of the citation process could be managed through the Panasonic Toughbook notebooks mounted in troopers' vehicles.

When officers observe a traffic violation, they enter the license plate number into E-TIX to check if the vehicle is stolen and to check for possible outstanding warrants or other information that demands caution. They can receive this information before the vehicle is stopped. Once a violator's vehicle is stopped, officers can quickly scan the driver's license using a two-dimensional (2-D) barcode reader mounted on the dashboard. Immediately, E-TIX populates the traffic violation form with the driver's information and checks federal and local databases for additional information. In addition, the system virtually eliminates errors on citations due to the business rules and cross-checks that are built into the system.

Rather than manually typing in extensive details, the officer uses the notebook's touchscreen to select whether to issue a warning or citation and the nature of the charges. In fact, the most common charges filed in Maryland can be selected by simply tapping the touchscreen. Once completed, the form is printed out with up to four charges on one sheet of paper. The paper copy is then provided to the violator, with digital copies uploaded to the server at MSP Headquarters. Records of all citations are delivered from the department server to the District Court for processing daily.

The ability to deliver citation data from nearly anywhere in the state is made possible by mobile cellular broadband services from AT&T. There are many areas (particularly in the western part of the state) where radio service can be intermittent due to the topography, and mobile broadband becomes the only method of communication officers can use. Each MSP car has a modem in the trunk, and mounted notebooks feature embedded wireless capabilities to deliver a stronger signal. Embedded modules are protected from the loss or damage that is common with external wireless cards, especially in the extreme environment of a patrol car. GPS coordinates are also captured on every traffic stop.

E-TIX with Other Agencies

Although E-TIX was developed by the MSP, it was designed to be used by law enforcement agencies across the state. The ability to share data immediately between agencies is an important benefit of e-citations, so the MSP made it a priority to get other departments on board.

Because E-TIX is offered as a free service, delivers robust features, and is easy to deploy and use, it has not been difficult to convince other agencies to become partners. There are currently 32 law enforcement agencies actively using the system, encompassing state (Maryland Transportation Authority Police, Department of Health and Mental Hygiene Police), county (Howard County Police, Charles County Sheriff), and municipal (Easton Police, Pocomoke City Police) jurisdictions. To avoid the expense and inconvenience of bringing 1,000 officers from around Maryland to one location for training, Sergeant Baralo and Corporal Corea conducted 75 regional training sessions across the state in three months. In just over one year of operation, more than 1,000 officers have conducted 187,000 traffic stops using E-TIX.

Going beyond Maryland with CapWIN

The extent of cross-agency collaboration made possible by E-TIX goes beyond the state of Maryland as well. The system has enabled communication and information sharing across the National Capital Region (NCR) by connecting users to the Capital Wireless Information Net (CapWIN). CapWIN is a regional coalition of public safety and transportation agencies across Maryland, Virginia, the District of Columbia, and the federal government whose mission is to enable and promote interoperable data communications, operational data access, and incident coordination and situational awareness across jurisdictions and disciplines.

A commitment to promoting the use of mobile technology within the MSP that started with automating traffic citations evolved to incorporate solutions that facilitate interagency coordination for all types of incidents.

The need for such an organization was identified 10 years ago, after the Woodrow Wilson Bridge, which carries Interstate 95 across the Potomac River, was shut down when someone threatened to jump off it. Numerous first responders arrived on the scene, including D.C. Police, Virginia State Police, and Maryland State Police, each with their own internal communication networks. In the end, the jumper was rescued, but the need for a seamless interoperable data communications network between all regional and federal agencies became clear.

CapWIN was developed and continues to be operated by the University of Maryland's Center for Advanced Transportation Technology (CATT). The team at CATT tackled the issue by developing government off-the-shelf (GOTS) software solutions designed to serve the unique needs of first responders and act as a data complement to voice communications.

CATT's primary solution is CapWIN Mobile, a rich data client providing secure access and incident coordination tools, including a sophisticated geographic information system (GIS)/mapping interface and public/private messaging systems. As with E-TIX, officers interact with CapWIN Mobile using the touchscreens on their mounted notebooks, and information is sent and received solely through cellular broadband services.

A commitment to promoting the use of mobile technology within the MSP that started with automating traffic citations evolved to incorporate solutions that facilitate interagency coordination for all types of incidents. With the CapWIN Mobile system, first responders can quickly report the nature and location of an incident of which other regional agencies should be aware, while accessing the databases of other CapWIN agencies to gather information on a driver or a vehicle they just stopped. In addition, an

instant messaging application allows specific officers to show when they are on duty and available and to type messages to other officers from any participating agency in real time.

There are valuable connections between the E-TIX and CapWIN databases. Every license plate and driver's license entered by an E-TIX user is made available to the entire E-TIX network, so Maryland state troopers will know immediately if the car they just pulled over was also cited for speeding by a Queen Anne's County sheriff's deputy yesterday or was stolen in D.C. an hour ago. Checks of all state and national databases (such as the National Crime Information Center) are performed by passing data from E-TIX to CapWIN. To ensure that all data are transferred quickly and accurately between the two systems, Corporal Corea worked closely with CapWIN while developing E-TIX—a collaboration that continues today.

“CapWIN's tenet was to spread information horizontally, not vertically, in facilitating cross-government collaboration for first responders,” said Roddy Moscoso, assistant director for CapWIN. “But when a particular agency like the Maryland State Police takes it upon itself to increase the amount of information that can be shared electronically, everyone benefits.”

Today, CapWIN has over 4,500 registered users from more than 80 public safety, transportation, and emergency services agencies drawn from all levels of government—including regional authorities—operating in the NCR. More than 750,000 instant messages are delivered between these agencies every month. Maryland state troopers ran just over one million law enforcement queries through the system in 2008.

Given its origin, perhaps the most fitting application for the CapWIN system was coordinating communications during the dedication ceremony for the newly rebuilt Woodrow Wilson Bridge in May 2008.

Success by Any Measure

It has been over a year since E-TIX received approval to issue e-citations, and already the benefits realized have been extraordinary. The average length of time for each traffic stop was cut in half, from eight to four minutes, keeping officers safely off the side of the road for an additional 10,800 hours during those 162,000 traffic stops.

The ability to track every warning issued to a driver has also had a more profound effect than the MSP expected. Before the system was implemented, drivers could commit the same infraction in different cities or counties and receive only a warning each time. Now over 10,000 repeat offenders have been identified, and when officers ask drivers if they have ever been stopped for the same offense in the past, officers will know whether the drivers' answers are truthful.

The benefits of mobile technology in the law enforcement profession can be incredibly powerful over time, because opportunities increase with every new technological advance.

Another positive effect of E-TIX was a 30 percent increase in the number of “reportable” stops. Maryland law requires every officer to capture additional information—such as the driver's age, race, and sex—on any traffic stop that is not based on a speed

measurement device (that is, radar or laser speed measurement). The extra time required to log these “reportable” stops in a separate system caused officers to become more reliant on radar and laser speed detection, spending less time actually patrolling and looking for nonspeeding violations.

E-TIX captures this additional information automatically on every stop. Whenever the 2-D barcode on a license is scanned, the driver’s profile information is automatically posted to the form. Now every citation takes the same amount of time, even when multiple charges are selected. This has encouraged officers to be more mobile and proactive while patrolling their areas. E-TIX also captures all the traffic statistics related to trooper performance that are required by commanders, relieving officers of yet another data collection task.

Looking Ahead

The benefits of mobile technology in the law enforcement profession can be incredibly powerful over time, because opportunities increase with every new technological advance. In the case of the MSP, what started as a straightforward deployment of rugged notebook computers in their vehicles has led to a complete streamlining of collecting, processing, and reporting traffic citations. Mobile computers have also provided significant improvements to problems the MSP was not expecting to solve when they were first issued, including officer safety and cross-agency collaboration.

As wireless signals grow stronger, Internet bandwidth expands, and computer processors get faster, mobile technology will continue influencing and improving every area of the law enforcement process. As long as agencies across the country find new ways to work together and share information in real time, U.S. neighborhoods and the officers patrolling them will only get safer. ■

Note:

¹U.S. Federal Bureau of Investigation, 2006 Law Enforcement Officers Killed and Assaulted, table 59, <http://www.fbi.gov/ucr/killed/2006/table59.html> (accessed April 7, 2009).

More information on the Maryland State Police, the E-TIX system, and CapWIN can be found at the following Web addresses:

- www.mdsp.org
- <http://etix.mdsp.org>
- www.capwin.org

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