

# TECHBeat

*Dedicated to Reporting Developments in Technology for  
Law Enforcement, Corrections and Forensic Sciences*

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**NLECTC**  
National Law Enforcement and  
Corrections Technology Center  
A Program of the **NIJ**  
National Institute of Justice

TechBeat is the bimonthly newsmagazine of the National Law Enforcement and Corrections Technology Center System. Our goal is to keep you up to date on technologies for the public safety community and research efforts in government and private industry.

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# GUNSHOT RESIDUE

*Analysis featured in New*  
**FTCoE Report**

*Series*  
By Becky Lewis

*At the end of a hectic week, have you ever looked at a newly published report, and wished someone would read it for you and tell you what's important?*

*The National Institute of Justice's Forensic Technology Center of Excellence (FTCoE) has launched a new series called Research in Brief that does just that, and the FTCoE is starting off by telling the field about changes coming in the analysis of gunshot residue that can increase its evidentiary value in court.*

*Organic Gunshot Residue Analysis for Potential Shooter Determination is an 18-page PDF available for download on the FTCoE website. It distills the results of two phases of evaluation and several lengthy reports into what FTCoE Director Jeri Ropero-Miller plans as the first in a new series, a series that will break down key research and evaluation components and findings into "something that the field can digest easily and quickly."*

*"A lot of our technical evaluation reports have a plethora of information, and that's great for some researchers, but for the practitioner who just wants to know the nuts and bolts, going through the tech report can be cumbersome," Ropero-Miller says. "For example, with this report, a gunshot residue analyst might want to read the technical report, but law enforcement agencies just want to know why the field is shifting from using inorganic alone to also analyzing for organic gunshot residue. This report tells them what they need to know."*

# RESIDUE ANALYSIS



For many years, GSR analysis was based on the detection and analysis of microscopic particles formed from metals found in the primer that are ejected after a firearm is discharged. These inorganic particles — lead, barium and antimony — can adhere to skin, clothing and other nearby materials when a gun is fired. Although chemical techniques for the detection and analysis of inorganic GSR have improved significantly since the 1990s, lead, barium and antimony are not specific to firearms, which is a limitation when interpreting GSR and reaching conclusions based on the inorganic materials. This has led to more interest in alternatives to analyzing the OGSR found in

The various residues produced when a firearm is discharged are referred to as gunshot residue (GSR), and in current forensic practice, this term refers to particulate residue, including inorganic metal oxides, found on suspected shooters. Current methods rely on an examination of the elemental composition and morphology of inorganic residues. Organic gunshot residue (OGSR) arises from stabilizers that keep the explosive charge from igniting prematurely. Traditional laboratory and field tests relying on traditional, inorganic residues may be limited by factors such as environmental contamination. OGSR chemicals are less subject to environmental interferences.

propellants. Studies are underway to establish the feasibility of using OGSR for the analysis to determine if someone fired a gun.

Conducted by Dr. Suzanne Bell and a team from West Virginia University for the FTCOE, the first two phases of testing and evaluation (for more details, see sidebar, "Organic Gunshot Residue Analysis: Results and Conclusions") looked at how adding the collection and analysis of OGSR could supplement and enhance current practices and increase the value of GSR evidence in court. That work now moves into Phase III, developing standard protocols and procedures for collecting and



analyzing evidence,  
as well as determining  
which instruments currently  
in use will produce the best results.  
Several labs are already on board to  
assist with this phase of the project by working  
with real-world samples.

“This technique will provide forensic practitioners with  
a different but complementary way to approach firearms  
discharge residue analysis,” Bell says. “The organic  
residues created by the discharge of a firearm have been  
evaluated before, but much more detailed study is needed  
to move toward routine application in casework. Having the  
ability to characterize organic residues will provide additional  
options for preliminary testing and increased confidence in  
identification. This project is focused on translating research  
into practice.”

John Morgan boiled down Bell’s research result into the  
FTCoE Research in Brief, and says he believes this is  
the wave of the future.

“Within the next five years, labs that  
haven’t begun using organic residue  
will be way behind the curve,  
because organic

residues add significantly to the evidentiary value of firearms discharge residue and should significantly reduce the incidence of false positives,” Morgan says. “You can find the elements in inorganic residue many places in the environment, such as when someone has just changed brake pads on a car. Organic residue from the stabilizers in explosives consists of chemicals that we do not expect to find in the background environment.”

Testing the OGSR may help to determine if someone fired a gun, but eventually may also provide information about when, Morgan explains.

“The organic markers absorb into skin. Some are more volatile than others, so you might one day be able to tell when the suspect fired a gun based on which of the stabilizer chemicals are still there, give or take a couple of hours,” he says. “So, for example, you could eliminate someone from suspicion because of the timeframe, and it allows police to check the results against someone’s story. There’s no way to do that with inorganic residue. Of course, there is much work to be done to understand these processes before this idea can be used in practice.”

With Phase I and Phase II evaluation complete, Bell and her team are moving on to Phase III, developing procedures to “get it off the swab and into an instrument that every lab has access to and that can provide confirmation results,” according to Ropero-Miller.

“In Phase III, we’re taking the procedures that Dr. Bell has developed and testing them in the field,” Ropero-Miller says. “She has a protocol for doing the hand swabbing, and we want to put it into the hands of some forensic investigators and law enforcement professionals and make sure it is accurate and easy to follow. She’s also been looking at multiple ways of performing the tests, and we want to work with some labs on testing and finding which ones work best in a practical setting. The labs may have other instrumentation that works as well or maybe even better. There’s usually more than one way to analyze results, and we want to see which ones are best.”

*Labs interested in assisting with Phase III evaluation of the organic gunshot residue analysis project should contact Suzanne Bell at [Suzanne.Bell@mail.wvu.edu](mailto:Suzanne.Bell@mail.wvu.edu) or Jeri*



*Ropero-Miller at [jerimiller@rti.org](mailto:jerimiller@rti.org). To access the report, go to <https://forensiccoe.org/Our-Impact/Advancing-Technology/Reports/Organic-Gunshot-Residue-Analysis-for-Potential-Shooter-Determination>.*

*For information on the projects and programs of the National Institute of Justice forensics technology portfolio, contact Gerald LaPorte, Director, Office of Investigative and Forensic Sciences, at [Gerald.LaPorte@usdoj.gov](mailto:Gerald.LaPorte@usdoj.gov).*

## Organic Gunshot Residue Analysis: Results and Conclusions

*Organic Gunshot Residue Analysis for Potential Shooter Determination* summarizes the results of an extensive evaluation of emerging approaches for the detection of gunshot residue based on organic materials in that residue. Conducted by West Virginia University (WVU) for the National Institute of Justice's Forensic Technology Center of Excellence (FTCoE), the evaluation examined the constituents of organic gunshot residue, how they are absorbed into the skin, sampling methods and analytical techniques.

The various residues produced when a firearm is discharged are referred to as gunshot residue (GSR), and in current forensic practice, this term refers to particulate residue, including inorganic metal oxides, found on suspected shooters. Organic gunshot residue (OGSR) arises from stabilizers that keep the explosive charge from igniting prematurely. Traditional laboratory and field tests relying on traditional, inorganic residues may be limited by factors such as environmental contamination. OGSR chemicals are less subject to environmental interferences.

In addition, OGSR may provide a longer window of opportunity for detection and the ability to estimate the time when a shot was fired. Therefore, OGSR may provide definitive evidence to identify shooters in more cases and with greater confidence. However, sampling must be carefully controlled to optimize collection efficiency and enable instrument detection, and there is a need to establish standard protocols for collecting, handling and analyzing samples.

In summary, the research (*Organic Gunshot Residue Analysis for Potential Shooter Determination*, p. 1) found the following:

1

The typical components of organic GSR include diphenylamine (DPA), ethyl centralite (EC), dimethyl phthalate (DMP), 2-nitrodiphenylamine (2NDPA) and 4-nitrodiphenylamine (4NDPA).

2

OGSR residues should be detectable on skin for many hours after a firing event of as few as one or two gunshots.

3

OGSR residues are not lost to secondary transfer [to another person or object]. Residues remain detectable for 12 to 24 hours, with the mechanisms of loss being evaporation and skin permeation. The degree of loss varies from compound to compound.

4

Existing pharmaceutical models can be used to estimate loss from the skin due to evaporation and permeation as a function of the compound and time elapsed.

5

Hand swab samples are stable for approximately two weeks when stored at -20° C. After this period, significant degradation of some of the more volatile compounds is evident. Thus, OGSR samples have a holding time limit.

6

The ability to detect specific OGSR compounds collected from hands at some time post-firing depends on the time elapsed, evaporative loss, loss to skin permeation, sampling efficiency, storage conditions, sample preparation and instrumental method.

7

The variation of persistence among OGSR compounds may lead to a viable method to estimate the time since deposition (i.e., time interval between a firearm discharge and the sampling event).

8

The performance of any instrument as a screening device is generally dictated by the hand swabbing technique, not any inherent limitations with the instruments. Both collection of GSR from the subject and extraction into an instrument are important variables.

9

It is recommended that standard reference samples (OGSR-impregnated swabs) be prepared for proficiency testing and other quality assurance/quality control purposes.

10

X-ray fluorescence (XRF) was examined in this study as a technique to screen hand swabs for the presence of metals associated with GSR (lead, barium, antimony). Because XRF is a non-destructive analytical method, it may be combined with other methods in the field or laboratory in sequence to produce effective screening. Lead is the most useful target element for XRF. Barium screening was found to be ineffective, and antimony appeared in only a very few positive samples. GSR detections based only on lead may be subject to false positives.

11

Although it is possible to perform ion mobility spectrometry (IMS) analyses in the research laboratory, significant work remains before IMS can be employed reliably in the field for OGSR screening purposes. The key development needed is a large population study and generalization of pattern-matching algorithms for differentiating shooters from non-shooters, along with an associated probability.

12

Differential mobility spectrometry is a promising alternative to IMS for OGSR detection, though additional work is required before a full validation study can be done.

Download *Organic Gunshot Residue Analysis for Potential Shooter Determination* at <https://forensiccoe.org/Our-Impact/Advancing-Technology/Reports/Organic-Gunshot-Residue-Analysis-for-Potential-Shooter-Determination>.

# SCHOOL EMERGENCY

Screencast Application *an*

**"EYE OPENER"**

*for* **Emergency Dispatch**

*By Becky Lewis*

*Every minute, every second, of every day, emergency dispatchers make decisions based on training and instinct. Unable to see what's happening on the other end of the line, they must rely on audio cues to assign the right codes, to accurately direct emergency personnel in their response.*

*A new technology developed by a partnership headed by the City of Ammon, Idaho, could be the first ripple that becomes the wave changing all that.*

The School Emergency Screencast Application ties together a school's existing camera system, the city's fiber optic network, ultra high-speed bandwidth and gunshot sensor technology to provide a live feed to emergency dispatch in the event of an active shooter incident. Winner of first prize in the National Institute of Justice (NIJ) Ultra-High Speed (UHS) Application Challenge, the app garnered a \$75,000 award that the city, Bonneville County and Bonneville Joint School District 93 will share, with a short-term goal of installing a fully functional system throughout test site Sand Creek Middle School and a long-term plan that just might see changes expand throughout the county's 22 schools and beyond.

Greg Warner, Bonneville County Emergency Communications Center Director, said the county's dispatch team found the concept fascinating, because for the first time they could see what was happening.

"It's a dramatic shift in their normal dispatching duties," Warner says. "They like the idea that they can see and express what they're seeing in real time to law enforcement, fire and paramedics. Historically, law enforcement would respond to an active

shooter situation blind, and now they could have a site assessment before they get on scene. We would certainly promote it here because we want to give first responders everything they need for the best possible outcome."

Some of that prize money may go toward getting the dispatchers what they need for a successful outcome as well, as City of Ammon Technology Director Bruce Patterson says he expects the county and school district to use their portions of the funds to purchase equipment needed for full implementation and to develop standard operating procedures. The city, which loaned some equipment to the county and school district during the development phase, will use its funds as needed to support the other two entities in their efforts.

While Ammon provided help to the county and school district to help them become part of the project, the city also received assistance in becoming involved in the Challenge in the first place. Ammon belongs to U.S. Ignite, an organization that promotes the use of high bandwidth resources to develop transformative and innovative advanced technology, and the organization brought the Challenge to Ammon's attention because of the city's existing fiber optic network.





Patterson says Ammon considered various options before deciding on the plan for the Challenge-winning app

“I knew the school district had these IP cameras and there were concerns about sharing the feed with the sheriff’s department and dispatch 24/7,” Patterson explains. “We came up with the idea of creating an automated system that would send an alert if triggered by a gunshot report. The idea advanced from providing dispatch with a still photo of the shooter to ultimately giving them access to all of the school’s cameras, which is actually easier to implement.”

The city established a goal of using existing technology as much as possible, adding the automation of gunshot sensors to the existing high-speed network and camera system.

“The idea of a network capable of instantly building a connection and providing bandwidth based on an automated trigger could, in addition, serve any number of future applications. For example, a trigger based on facial recognition or a trigger based on a crowd of people fleeing down a hallway would be easy to implement

using the foundation laid in this project,” Patterson says, and such an application could prove life-saving in the event of an active threat using a knife or other silent weapon. “By making what we created extensible, it can serve many other purposes in the future.”

The Ammon team explained the concept well enough in its Phase I proposal that the city advanced to Phase II of the Challenge, which entailed actually developing and building the app. An immediate challenge arose with the gunshot sensor portion of the project, because while sensors work well outdoors where sound travels in one direction, indoor sensing is another matter, particularly in a school filled with slamming locker doors and other loud, sharp background noises. The partnering sensor vendor persisted, using ongoing recording throughout the school year to continually refine and improve the product’s false-positive ratio to the point that Patterson says that most of the time, it’s accurate within three feet. The vendor achieved those results through several rounds of testing the sensors against shots fired inside the school from multiple handguns and rifles of differing calibers, he says, using the data collected to refine the sensors’ algorithm to filter out everything but gunfire.

“We felt pretty confident going in that we could do it because the technological barriers were low, and the biggest barrier turned out to be people and policies,” Patterson says. “Nobody thought it was a bad idea, but there were concerns, although those faded when they saw the accuracy of the demo. Now the county and school district just need to develop policies that meet their comfort levels. And once there is investment on the part of the people using the system, they will think of how to improve or expand on it.”

While the policy and procedure development will primarily come from Warner and the Emergency Communications Center team, the school district and the Bonneville County Sheriff’s Office also have roles in the future of the project, as they have throughout the initial development stages. In addition, Capt. Samuel Hulse of the sheriff’s office, the primary liaison with the city, thinks the system could have future applications outside the school system.

Capt. Samuel Hulse of the sheriff’s office, the primary liaison with the city, thinks the system could have future applications outside the school system.

## NIJ Challenge Competitions Foster Innovative Solutions

The use of National Institute of Justice (NIJ) Challenge competitions allows the agency to cast a wider net for potential innovators to develop solutions to technology problems.

Challenges can serve as alternatives to the traditional grant-making process and provide a more flexible vehicle to broaden the scope of potential applicants and drive innovation, resulting in products such as the School Emergency Screencast Application, first-prize winner of the NIJ Ultra-High Speed (UHS) Application Challenge.

“The federal government uses a variety of funding mechanisms to accomplish goals and activities. Each vehicle has its own merits and fulfills a different purpose,” says Nancy Merritt, NIJ Senior Policy Advisor. “The benefit of the Challenge process is that it allows for more flexibility, with the potential to bring in a wider, more diverse, field of applicants. We are able to go beyond the criminal justice

field and draw from other fields to tap into a pool of innovators who we might not reach otherwise.”

The Challenge process can also save federal agencies money because funds are only expended when a successful solution, that meets the prescribed criteria, is developed and chosen. “Therefore, the taxpayer pays only for products that are delivered and meet, or exceed, stated expectations,” Merritt says.

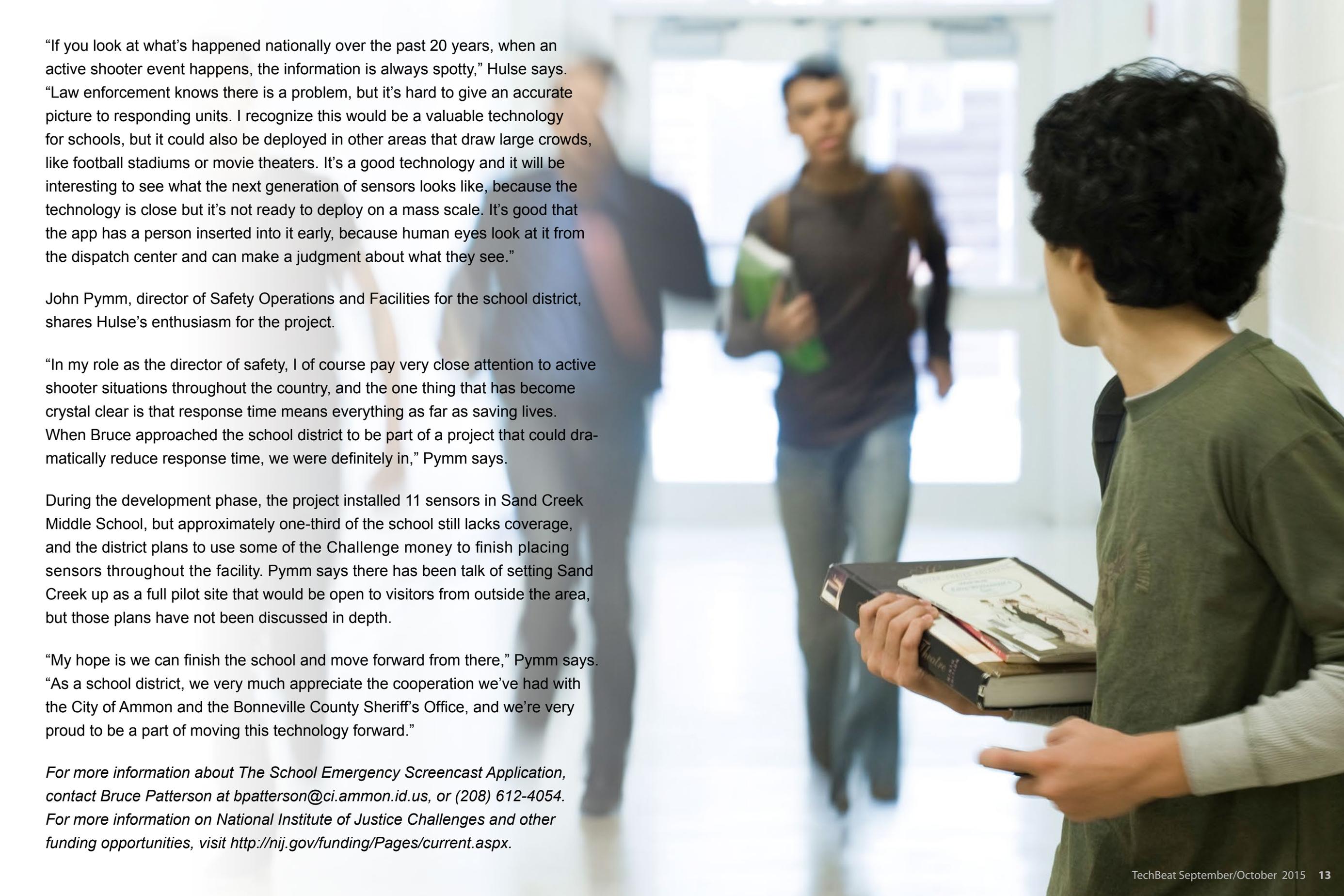
For the UHS Challenge, NIJ worked collaboratively with the National Science Foundation and the White House Office of Science and Technology Policy to promote the development and evaluation of criminal justice software applications that are compatible with UHS networks. For the purposes of this evaluation, NIJ considered UHS to be 100Mbps symmetrical up to 1Gbps symmetrical. The NIJ UHS Application Challenge sought the creation of apps that are compatible

with UHS networks and measurably improve the efficiency or effectiveness of criminal justice and public safety services and operation.

As with grants and other types of funding, the Challenge method is a competitive peer-reviewed process.

“We engage peer reviewers from relevant areas of expertise. So we have used engineers, law enforcement officials, researchers, app developers and others, depending on the specific Challenge topic,” Merritt says.

The NIJ Challenge program is part of the overall federal Challenge program that began in 2010. To learn more about NIJ Challenges, visit <http://nij.gov/funding/Pages/challenges.aspx>. For information on other federal government agency Challenges, go to [www.challenge.gov](http://www.challenge.gov).

A young man with dark, curly hair, wearing a green t-shirt, is seen from the side in a school hallway. He is holding a stack of books in his left hand and a smartphone in his right hand. In the background, other students are walking, and the hallway is brightly lit with large windows.

“If you look at what’s happened nationally over the past 20 years, when an active shooter event happens, the information is always spotty,” Hulse says. “Law enforcement knows there is a problem, but it’s hard to give an accurate picture to responding units. I recognize this would be a valuable technology for schools, but it could also be deployed in other areas that draw large crowds, like football stadiums or movie theaters. It’s a good technology and it will be interesting to see what the next generation of sensors looks like, because the technology is close but it’s not ready to deploy on a mass scale. It’s good that the app has a person inserted into it early, because human eyes look at it from the dispatch center and can make a judgment about what they see.”

John Pymm, director of Safety Operations and Facilities for the school district, shares Hulse’s enthusiasm for the project.

“In my role as the director of safety, I of course pay very close attention to active shooter situations throughout the country, and the one thing that has become crystal clear is that response time means everything as far as saving lives. When Bruce approached the school district to be part of a project that could dramatically reduce response time, we were definitely in,” Pymm says.

During the development phase, the project installed 11 sensors in Sand Creek Middle School, but approximately one-third of the school still lacks coverage, and the district plans to use some of the Challenge money to finish placing sensors throughout the facility. Pymm says there has been talk of setting Sand Creek up as a full pilot site that would be open to visitors from outside the area, but those plans have not been discussed in depth.

“My hope is we can finish the school and move forward from there,” Pymm says. “As a school district, we very much appreciate the cooperation we’ve had with the City of Ammon and the Bonneville County Sheriff’s Office, and we’re very proud to be a part of moving this technology forward.”

*For more information about The School Emergency Screencast Application, contact Bruce Patterson at [bpatterson@ci.ammon.id.us](mailto:bpatterson@ci.ammon.id.us), or (208) 612-4054. For more information on National Institute of Justice Challenges and other funding opportunities, visit <http://nij.gov/funding/Pages/current.aspx>.*

# TECHNOLOGY

*Used To Enhance*

# BIKE SAFETY

*Program*

*By Michele Coppola*

*Chattanooga police are using ultrasonic sensor technology to help enforce a Tennessee state law that requires motorists to provide no less than 3 feet of clearance when passing bicyclists.*

Police began using the portable technology, which Chattanooga refers to as Bicyclist and Safe Monitoring Applied Radar (BSMART), in the spring of 2015 as part of the city's Safe Bicycling Initiative, which is an effort to make motorists aware of the 2007 law and to be mindful of the best way to share the road to keep everyone safe. It is the first city to deploy the device.

"The mission is to improve the safety of the most vulnerable road users by improving relationships between motorists and cyclists, to help motorists understand the risks for bicycles," says Chattanooga Police Chief Fred Fletcher. "Most of the things motorists are doing is from lack of understanding, rather than malicious effort. Most people will act more safely if they understand the issues and risks."





ALARM BUZZER

CAPTURE  
RESET BUTTON

GOPRO  
ACTION CAMERA

ULTRASONIC RANGE  
FINDER SENSOR

DISTANCE DISPLAY

ADJUSTABLE ARMS



Hamilton County, which includes Chattanooga, had 196 bicycle-related crashes, including two fatalities, from 2010 through 2014.

The portable technology is mounted on handlebars and uses an ultrasonic sensor to calculate the distance between a passing car and a bicycle. The device displays the distance in inches and beeps an alarm if the vehicle comes within 36 inches. A GoPro camera, which is purchased

separately, records the vehicle passing and the inches display.

“The second day I had the device I was in full uniform and was able to pull a motorist over on my bike because it was in a congested traffic area,” says Officer Rob Simmons, who has been on bike patrol for seven years and is the lead on the Chattanooga safe biking effort.



*“Judging distance is difficult. That is why this device is important; it confirms the distance for evidentiary use in court.”*

*--Officer Rob Simmons,  
Chattanooga Police Department*

The city uses billboards and rear window wraps on patrol cars to educate the public about the bike passing law.

The city periodically employs “stings,” which are planned operations in which officers in plain clothes will alert a patrol car waiting nearby to stop an offending motorist. A citation is \$120, which includes the fine and court costs. Judges can order a motorist to go through a 90-minute cycling education class.

Most of the time Simmons issues motorists warnings and provides educational literature. Simmons will play back the video for the stopped motorist showing how close they came to the bike.

“I have developed a small pocket-sized booklet to give to people who are stopped.

We are out there to educate the public, not write tickets,” Simmons says.

“Me stopping someone is behavior modification.”

Bike officers don’t always use the sensor technology and are trained on judging the 3-foot distance.

“Evaluation of distance comes with experience,” Simmons says. “Judging distance is difficult. That is why this device is important; it confirms the distance for evidentiary use in court.”

The device, which sells for \$1,400, was purchased by Friends of Outdoor Chattanooga for use by the police department. Simmons says thus far, “The device has performed perfectly.”

# 3ft It's The Law.



## Austin's Bike Safety Program

Austin instituted a Safe Biking Initiative in 2013, where Fletcher was a police commander before becoming Chattanooga chief in 2014.

In Austin, bicycle ridership in the city accounts for between 7 and 10 percent of vehicles on the road, according to Officer Rheannon Cunningham, who developed and coordinates the city's Safe Biking Initiative. The initiative includes periodic stings, a public safety announcement and rear-window wraps on patrol cars to help educate the public.

Austin's 2009 vulnerable road users ordinance covers more than bicyclists, for example, pedestrians, construction workers, the physically disabled and people on horseback, and requires motorists to allow at least 3 feet of clearance when passing. For large trucks and buses the distance is 6 feet.

Austin officers are trained in judging passing distance and use cameras to record passing motorists. To augment its bike safety program, Austin began testing one of the ultrasonic sensor devices during the summer of 2015.

The total number of reported bicycle-related collisions fell from 346 in 2012 to 207 two years later. The numbers include fatalities and injury and non-injury collisions involving a motor vehicle, another bicycle rider or single-rider crashes.

In 2010, officers issued four citations to motorists for violation of the 3-foot law; in 2013, the year the Austin began its initiative with

## BICYCLES ARE VEHICLES.



a new emphasis on enforcement, they issued 39 citations and 78 warnings.

Austin bicycle officers try to conduct stings with the help of patrol cars about once a month. Sting areas are determined by the amount of accidents and bicycle use.

“We always use plain clothes because when people see a police officer they may slightly change their behaviors,” Cunningham says, “so we want a real representation of how a motorist would act with a cyclist on the road.

“One of us was passed within 2 1/2 feet by a bus, which is required to keep a 6-foot width, which was scary. Another time, one car passed us less than a foot away and you can hear us scream on the video because we thought we were going to get hit.”

In Chattanooga and Austin, police worked closely with community groups.

“In both Austin and Chattanooga, the community response to the efforts to improve motorist-cyclist relationships has been overwhelming,” says Fletcher. “In Austin, community groups made significant unsolicited cash and in-kind donations to support our efforts. In Chattanooga, the same thing happened as you saw with the sensor device and over a dozen billboards donated to help the cause.”

*For information on the Chattanooga bike safety program and use of the sensor device, contact Officer Rob Simmons at [simmons\\_r@chattanooga.gov](mailto:simmons_r@chattanooga.gov). For the Austin program, contact Officer Rheannon Cunningham at [Rheannon.cunningham@austintexas.gov](mailto:Rheannon.cunningham@austintexas.gov).*



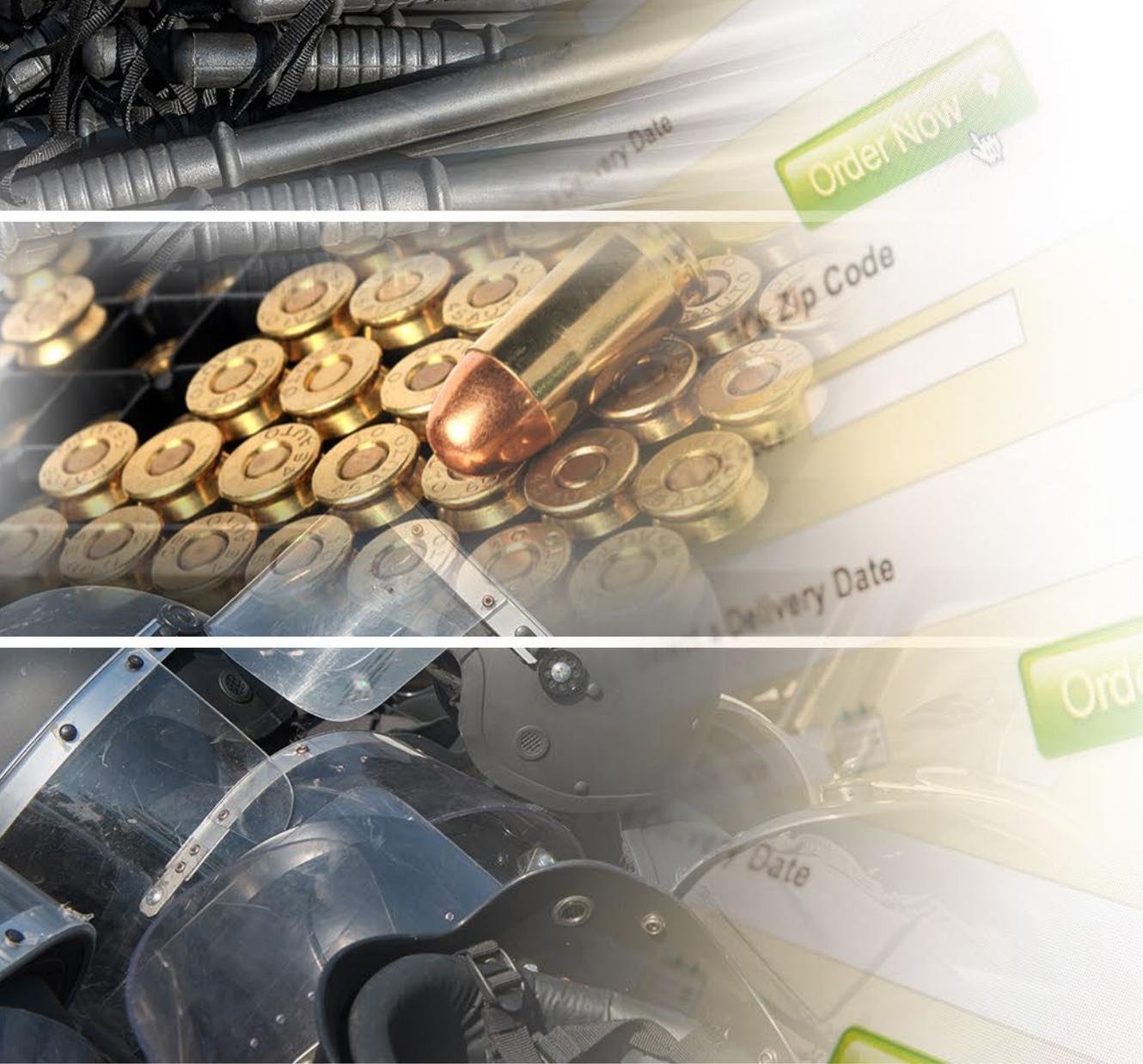
# Technology

*helps agencies* **SAVE TIME, MONEY** *on Purchases*

**By Becky Lewis**

*In small towns, agencies might not purchase new equipment very often. They might not have contacts at other agencies to ask which vendors they've chosen in the past for similar purchases. They might not know that they're being overcharged because of their locations and the size of their orders.*

*Unless they have access to a database that tells them what other agencies are buying.*



Used by the Aventura (Fla.) Police Department and numerous other agencies across the country, the technology offers Google-like ease of access to purchase information submitted by participating agencies. A few simple clicks and keystrokes, and agencies can learn who has bought what, from which vendor and for how much. Find a vendor that meets the right qualifications, and with a few more clicks, a request for purchase (RFP) based on another agency's existing purchase order is on its way.

"The software saves me just an unbelievable amount of time," says Capt. Tom Labombarda of the Aventura PD. "In the past, for most purchases over \$2,500, I'd have to do some legwork to find three vendors, then write RFPs to solicit quotes. Now, I can log in and do everything within a matter of minutes. Typically, I get quotes in two to three days, and if they're higher than what I found in the database, I know that I can negotiate with them. We've been able to find items significantly cheaper compared to doing it the old way, and we've saved our department literally thousands of dollars in manpower and time."

Although all agencies purchase equipment, they use different technologies to record their information. This technology normalizes that information into a single database and allows agencies to effectively share information and also to source vendors they wouldn't otherwise know about.

Vendors can benefit just as much from using the database, as they can gain information about their competitors' activities





and perform market analysis of their findings. And it also helps vendors to become better known in the public safety community.

The specific database that the Aventura Police Department uses includes some 200 million purchase orders from 8,500 local, state and government agencies. Aventura, which has 86 sworn officers and more than 50 civilian employees, helped beta test the initial version, and according to Labombarda, has continued to use it due to successes like a recent purchase of thermal paper for patrol car printers.

“A case of 12 rolls cost about \$120 and I was buying 10 to 20 cases a month. It added up,” Labombarda says. “Through the technology, I found a vendor selling the exact same paper for \$2 a roll, and that’s now our go-to vendor. When you have the power of information, it’s a lot easier to get a vendor to give you a better price.”

In addition to assistance with pricing, agencies can also use the technology to obtain the names of other agencies to use for reference checks rather than using agency names provided by a vendor.

“I usually get bids from six or seven vendors, it’s so easy, and that makes the city purchasing department happy because they’re more than meeting their obligation to get multiple quotes.

## Bid Proposal

is the bid of BIDDER, and BIDDER enters into a cc with the invitation to bid. and further



\$12,589

\$12,450

\$16,318

\$9,736

\$11,312

In fact, they've begun using the technology for assistance with making purchases for other city departments," Labombarda says. "I wear a lot of other hats besides purchasing, which is very typical in a small/medium department, and purchasing is typically the one that takes up the most time. This technology takes so much of that effort off the table and frees me up to focus on other things that are more important."

*For more information on how Aventura PD uses purchasing database technology, contact Capt. Tom Labombarda at [labombardat@aventurapolice.com](mailto:labombardat@aventurapolice.com).*

TECHshorts is a sampling of the technology projects, programs and initiatives being conducted by the Office of Justice Programs' National Institute of Justice (NIJ) and the National Law Enforcement and Corrections Technology Center (NLECTC) System, as well as other agencies. If you would like additional information concerning any of the following TECHshorts, please refer to the specific point-of-contact information that is included at the end of each entry.

In addition to TECHshorts, *JUSTNET News*, an online, weekly technology news summary containing articles relating to technology developments in public safety that have appeared in newspapers, newsmagazines and trade and professional journals, is available through the NLECTC System's website, [www.justnet.org](http://www.justnet.org). Subscribers to *JUSTNET News* receive the news summary directly via email. To subscribe to *JUSTNET News*, go to <https://www.justnet.org/app/puborder/subscribe/subscribe.aspx>, email your request to [asknlectc@justnet.org](mailto:asknlectc@justnet.org) or call (800) 248-2742.

*Note: The mentioning of specific manufacturers or products in TECHshorts does not constitute the endorsement of the U.S. Department of Justice, NIJ or the NLECTC System.*

## Ballistic-Resistant Body Armor Basics Provides Information Every Officer Should Know

### National Law Enforcement and Corrections Technology Center

Body armor is the most important personal protective equipment available to law enforcement officers, but few officers who wear body armor understand its critical aspects. A new brochure produced by the National Law Enforcement and Corrections Technology Center (NLECTC) System provides the basic information that every officer should know in an easy-to-read bullet format, along with resources for further information.

The brochure, *Ballistic-Resistant Body Armor Basics*, covers important information on how body armor should fit and tells readers how to find out more about the National Institute of

Justice (NIJ) Compliance Testing Program (CTP). It includes links to resources such as JUSTNET, the NLECTC System website and home of the CTP's Compliant Products List, and PoliceArmor.org, a new NIJ-sponsored website that provides detailed information on selection and fit, why officers should wear their body armor and more.



Click <https://www.justnet.org/pdf/Ballistic-Resistant-Body-Armor-Basics-Web-final-07142015.pdf> to access the brochure directly. It can also be accessed from JUSTNET's ballistic-resistant body armor for law enforcement officers page at [https://justnet.org/body\\_armor/ballistic\\_le.html](https://justnet.org/body_armor/ballistic_le.html) and PoliceArmor.org's Selection and Fit pages at [https://www.policearmor.org/selection\\_fit.html](https://www.policearmor.org/selection_fit.html).

## Childhood Trauma and Law Enforcement

Harvard Kennedy School/National Institute of Justice

*Childhood Trauma and Its Effects: Implications for Police* is part of the New Perspectives in Policing series. The paper summarizes the current understanding of the effects of ongoing trauma on young children, how they impair adolescent and young adult functioning, and the implications for police. The author explains how training for



police to recognize and appropriately respond to trauma will allow for better early intervention for children exposed to violence, improve de-escalation of incidents involving traumatized individuals and lead to more referrals to support services.

This is one in a series of papers to be published as a result of the Executive Session on Policing and Public Safety, sponsored by the Harvard Kennedy School and the National Institute of Justice. To read the paper, go to <https://www.ncjrs.gov/pdffiles1/nij/248686.pdf>.

## Organization Offers Tips for Firearms Simulator Instructors

Kentucky League of Cities Insurance Services

The Kentucky League of Cities Insurance Services (KLCIS) Loss Control Law Enforcement Program, which offers firearms simulator training to law enforcement officers throughout that state, has released safety tips and reminders for safe firearms simulator training in the wake of several recent incident discharges of actual weapons during trainings by non-KLCIS instructors.



Tips include locating a concrete wall behind similar screens, posting signage banning weapons from training areas, providing gun safes to secure weapons during training, and remaining vigilant throughout.

You can find out more information at the organization's website, [klcis.org](http://klcis.org).

# PUBLIC SAFETY TECHNOLOGY

JUSTNET

## In The News

Following are abstracts on public safety-related articles that have appeared in newspapers, magazines and websites.

### Schools Installing 'Panic Button' App

*Cleveland County Herald, (08/26/2015)*

Arkansas schools will be equipped with a smart phone program that will notify emergency personnel of a crisis. The 2015 School Safety Act requires each school to be equipped with a "panic button" system that quickly notifies law enforcement, the fire department and other emergency responders, and school personnel, of an emergency situation. The app immediately connects to 9-1-1. The 9-1-1 dispatcher and first responders automatically receive critical data such as the caller's exact location, floor plans, exit locations and emergency contacts, and can deliver emergency notifications to onsite contacts.

<http://www.clevelandcountyherald.com/2015/08/26/schools-installing-panic-button-app/>

### Sheriff's Office Touts Statistical Policing

*Northwest Florida Daily News, (08/23/2015), Tom McLaughlin*

The Walton County Sheriff's office in Florida uses stratified policing, which combines hot spot policing, community policing and intelligence-led policing in a stratified approach so that resources can be concentrated in areas where they are most needed. Walton County is the second county in Florida, and one of the first in the U.S., to implement the stratified policing concept. The sheriff's office reports that so far the agency is exceeding its goal of a 10 percent reduction in crime in seven targeted areas.

<http://www.nwfdailynews.com/article/20150823/NEWS/150829756>

### New Video from ISRI Aims to Help Local Law Enforcement Combat Metals Theft

*PR Newswire, (08/26/2015)*

A new video is available that addresses metals theft and how law enforcement can combat it. *Fighting Metals Theft: Perspectives from Law Enforcement and Industry* is the work of the Institute of Scrap Recycling Industries with assistance from the National Sheriffs' Association and the International Association of Chiefs of Police. The video features interviews with law enforcement leaders and recycling industry experts.

<http://www.prnewswire.com/news-releases/new-video-from-isri-aims-to-help-local-law-enforcement-combat-metals-theft-300133799.html>

### CONTACT US

Call the NLECTC Information Hotline at 800-248-2742 or email [asknlectc@justnet.org](mailto:asknlectc@justnet.org).

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### FUNDING ASSISTANCE

NLECTC is offering tools and assistance to help law enforcement and corrections agencies locate and apply for funding opportunities.

### Federal Funding Opportunities:

See [www.nij.gov](http://www.nij.gov) or [www.grants.gov](http://www.grants.gov).

### Give Us Your Tech Ideas

We are actively seeking ideas to help us identify technology needs and requirements as part of the National Institute of Justice's Research, Development, Testing, and Evaluation process.

*Click here for recent public safety-related articles from the news media.*



# WWW.JUSTNET.ORG

**JUSTNETNews.** Includes article abstracts on law enforcement, corrections and forensics technologies that have appeared in major newspapers, magazines and periodicals and on national and international wire services and websites.

**Testing Results.** Up-to-date listing of public safety equipment evaluated through NIJ's testing program. Includes ballistic- and stab-resistant armor, patrol vehicles and tires, protective gloves and more.

**Calendar of Events.** Lists upcoming meetings, seminars and training.

**Social Media.** Access our Facebook, Twitter and YouTube feeds for the latest news and updates.

**Do More With Less.** Highlights creative programs and resources to help agencies meet challenges as budgets shrink and demands on departments grow.

**Tech Topics.** Browse for information on specific topics such as biometrics, cybercrime, forensics and corrections.



## Public Safety Technology in the News.

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