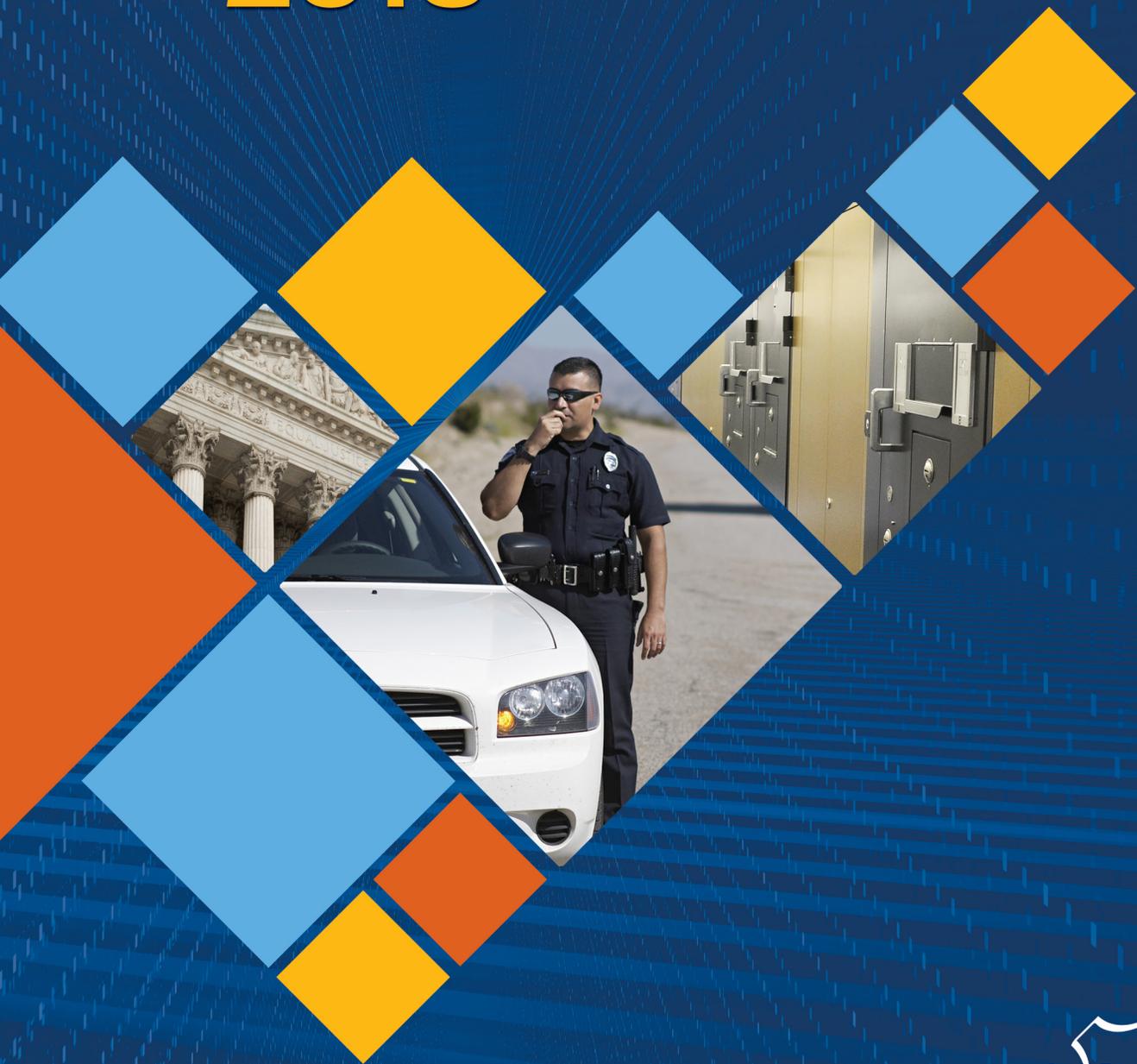


NLECTC System

Annual Report

2016





POLICE LINE-DO NOT CROSS POLICE LINE

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EXECUTIVE SUMMARY

A New Look and an Expanded Electronic Presence

During 2016, JUSTNET, the website of the NLECTC System, not only took on a new look and feel, it also deepened and expanded its online connections to subsites such as PoliceArmor.org and SchoolSafetyInfo.org, added a new internal subsite for the Justice Innovation Center and increased its offerings related to key hot topics identified by the National Institute of Justice. With JUSTNET acting as the linchpin, the five components of the NLECTC System continued to spread the word about innovations in technology, reaching out through channels such as:

- Face-to-face meetings and conferences.
- Video, social media and other virtual portals.
- Electronic publications including reports, magazines and newsletters.



The component centers also continued gathering information from the field on future technology needs, helping inform NIJ efforts in the areas of research and development as well as identifying best practices currently in use in the field.

As it has throughout its 21-year history, the NLECTC System has provided, and will continue to provide:

- Scientific and technical support to NIJ’s research, development, test and evaluation (RDT&E) projects.
- Support for the transfer and adoption of technology into practice by law enforcement and corrections agencies, courts and crime laboratories.
- Assistance in developing and disseminating equipment performance standards and technology guides.
- Assistance in the demonstration, testing and evaluation of criminal justice tools and technologies.
- Technology information, in addition to general and specialized technology support.
- Assistance in setting NIJ’s research agenda.

Justice Technology Information Center

The Justice Technology Information Center manages the JUSTNET website and as such, orchestrated the redesign and redevelopment so key to the NLECTC System outreach efforts. You can read about these efforts on p. 7.

JTIC serves as both the initial point of entry for criminal justice professionals and other interested parties, and the clearinghouse that disseminates information to those constituents. Requests for technology, information or materials via the “Ask NLECTC” mailbox (asknlectc@justnet.org) or the toll-free line at (800) 248-2742 come through JTIC. Staff either fulfills the request immediately if it falls within JTIC’s unique areas of expertise or quickly moves it to the component center that can handle the request most efficiently.



JTIC's unique areas of expertise include non-biased, science-based knowledge and expertise in equipment testing and standards (body armor, police vehicles, ballistic shields and others). JTIC uses that expertise to:

- Conduct equipment testing programs, review and analyze testing data, and disseminate results.
- Operate JUSTNET and manage the system's social media outlets, including Twitter, Facebook and YouTube.
- Manage SchoolSafetyInfo.org, NLECTC's website dedicated to school safety news, information and technology, and related print and electronic publications on school safety, and PoliceArmor.org, a "one-stop shop" for the information related to both ballistic- and stab-resistant body armor that public safety professionals need to know.
- Disseminate print and online newsletters and bulletins, including *TechBeat* and *JUSTNETNews*.
- Help NIJ identify and prioritize technology needs and requirements.

In addition to learning more about the JUSTNET project, you can read about the development and release of the NIJ Mark to indicate compliance with program standards on p. 19, JTIC staff assistance at a major meeting sponsored by the NIJ Comprehensive School Safety Initiative on p. 27, creation of the new Safeguarding Houses of Worship app on p. 31 and efforts to increase law enforcement agencies' understanding of the use of unmanned aviation systems on p. 51.

Justice Innovation Center for Small, Rural, Tribal, and Border Agencies

The Justice Innovation Center for Small, Rural, Tribal, and Border Agencies has been charged by NIJ with identifying, evaluating and disseminating technology solutions that meet the operational challenges of small, rural, tribal and border law enforcement, courts and corrections agencies.



To fulfill this mission, JIC works to:

- Identify unmet operational needs across SRTB corrections, courts and law enforcement agencies.
- Compare shared needs across SRTB agencies to identify possibilities for overlap and the implementation of shared technologies.
- Provide information on technology through case studies, pilots and evaluations to demonstrate how technology is currently being used to assist SRTB agencies in overcoming their unique challenges.
- Identify and rigorously evaluate new technologies or solutions to assess their effectiveness and cost-effectiveness when used by SRTB agencies.
- Support the adoption of innovations that meet the operational demands of SRTB justice systems.
- Provide feedback to NIJ on the existing needs of SRTB agencies and where technology is either working or failing to meet those needs.

You can read more about JIC efforts, including a report that focused on identifying the specific challenges faced by SRTB criminal justice agencies, on p. 55.

Criminal Justice Priority Technology Needs Initiative

The Criminal Justice Priority Technology Needs Initiative is carrying out a research effort to assess and prioritize technology needs across the criminal justice community. The fundamental goal is to enable innovation in the U.S. criminal justice community — from incremental changes in the way agencies do daily tasks, increasing their efficiencies and solving their current



problems to transformational changes that make it possible for them to do entirely new things or accomplish objectives in new ways. You can read about the Initiative’s activities on p. 63.

National Criminal Justice Technology, Research, Test and Evaluation Center

The National Criminal Justice Technology, Research, Test and Evaluation Center conducts focused research, testing and evaluations of non-forensic technologies intended to enhance the capabilities of state and local law enforcement and corrections agencies. Working closely with practitioners, the Center strives to inform the field concerning technology and related issues in an innovative, sustainable, efficient and effective manner. The Center conducts market surveys, determines technical performance of selected technologies and conducts operational assessments and impact assessments to determine practical outcomes for practitioners of NIJ-funded R&D programs and other technology developments. RT&E Center efforts span areas as diverse as school safety and pursuit technology; you can read about the center’s activities on p. 71.

Forensic Technology Center of Excellence

The Forensic Technology Center of Excellence (CoE) improves the practice of forensic science and strengthens its impact through rigorous technology corroboration, evaluation and adoption, effective knowledge transfer and education, and comprehensive dissemination of best practices and guidelines to agencies dedicated to combating crime. You can read about several of its efforts starting on p. 89.



JUSTICE TECHNOLOGY INFORMATION CENTER

Bringing Users the Website They Requested

Feedback from a focus group....emails from users...metrics on site traffic. Take all of that input, add an easy-to-navigate interface that moves seamlessly from desktop to notebook to mobile device and a design that emphasizes the target audiences of law enforcement, courts and corrections, and the result is the newest iteration of JUSTNET, the website of the NLECTC System, which launched in May 2016.

“Starting right after the previous revision in 2010, we began keeping metrics on who is looking at JUSTNET and what topics were drawing the most interest,” says JTIC deputy director Ron Pierce, who headed the redesign effort. “And in addition to general feedback, we have ‘superusers’ who are constantly on the site and who tell us what they’d like to see. And of course NIJ always wants us to promote new products and new initiatives.”

One of those new initiatives was the transition from the previous NLECTC-National project to JTIC, which included a new emphasis on courts and the technology affecting them. The need to reach out to this three-pronged audience drove JUSTNET’s new design, which divides information into the three categories starting right on the home page.

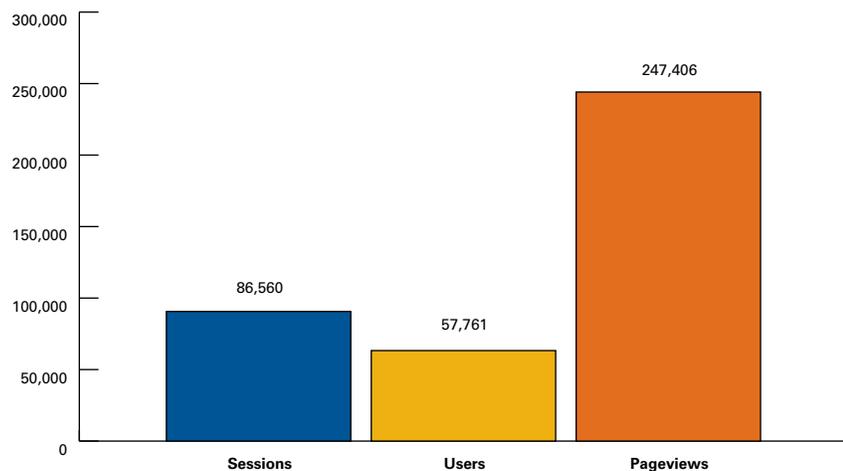


“You can sift down from there and more easily find related topics,” Pierce says. “And of course we want JUSTNET to be a main central hub for public safety technology that also provides an avenue to our other resources, PoliceArmor.org and SchoolSafetyInfo.org.” Those two satellite sites on body armor and school safety serve as a way to both allow users interested in those areas to find the information they need quickly and to help keep JUSTNET itself more streamlined and focused. As 2016 ended, both satellite sites were in the middle of a redesign process that will incorporate lessons learned from the JUSTNET revision.

“One lesson we learned was to feature the information that people searched for the most ‘front and center.’ Body armor of course is the subject that brings the most users to our site, and they can easily find links to what they need from the home page, whether they’re interested in purchasing compliant armor, looking to participate in the Compliance Testing Program or just searching for more information,” he says.

In addition to the increased emphasis on body armor, JUSTNET now includes subject-area pages on evidence-based policing, houses of worship (HOWs) and suicide prevention: “Evidence-based policing is something that has become an important aspect of policing, and users were asking for more information. And even prior to the attack in Charleston in June 2015, we had begun developing our Safeguarding Houses of Worship app (see “New NIJ App Helps Houses of Worship Plan for Safety,” p. 31) to help law enforcement assist HOWs with developing emergency plans. In addition to information on how to obtain the app, JUSTNET includes resources put together with assistance from the U.S. Department of Homeland

EXHIBIT 1: JUSTNET WEB ACTIVITY





Security Center for Faith-based and Neighborhood Partnerships, which is associated with the White House Office of Faith-based and Neighborhood Partnerships.”

Another new feature is a dynamic market survey on body worn cameras (BWC). Although other agencies have also done market surveys on BWC, those are static PDF documents. Instead, JTIC’s version is a database that is continually updated with new products and new information on existing products.

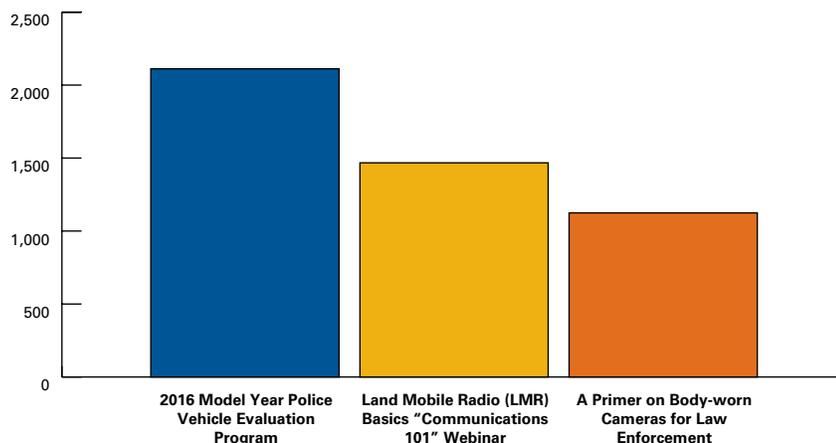
“And one more new feature that we’re pretty proud of is our blog. Most of our subject-matter experts here at JTIC have already written blog entries, and we have some of our NIJ program managers scheduled to write about current topics in 2017,” Pierce says. “It’s all part of our effort to make JUSTNET the place to go for public safety information.”

Field Search: Field-Based Computer Forensics Software Widens Its Scope

A soldier doing a field check on a computer recovered at an IED explosion site. A police officer doing a “knock and talk” investigation. A computer forensics expert doing triage on a number of suspect computers. A federal agent searching for intelligence related to counterterrorism activities. And a probation and parole officer, checking up on a sex offender’s Internet use.

What do they all have in common? They’re all using Field Search, the free forensics software provided by JTIC.

EXHIBIT 2: MOST DOWNLOADED PUBLICATIONS FROM JUSTNET



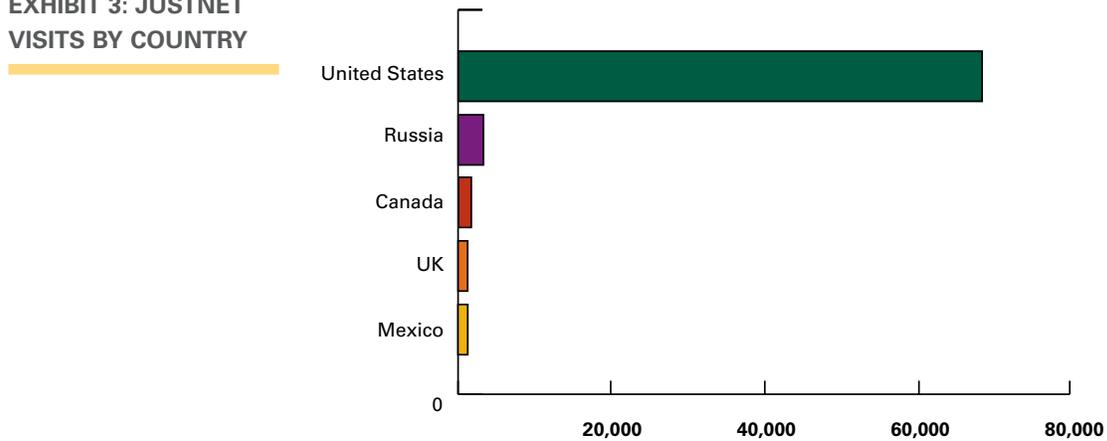


When the NLECTC System began providing Field Search in 2006, probation and parole agents who needed a nontechnical tool to check up on client computers while in the field made up the target audience. As the software has morphed through five iterations — the most recent (5.0) released in early January 2016 — more and more users in a wider variety of criminal justice fields, and even the U.S. military, have found that Field Search meets needs far beyond the suite’s original scope.

Field Search, provided by JTIC to only vetted active professionals, allows users to quickly and efficiently search a target computer and create a detailed report of the findings. Originally developed with funding from NIJ and since upgraded by the developers at no charge to the federal government, Field Search can be launched from a USB drive and works live on a suspect computer to quickly find potential evidence such as Internet histories, images, multimedia files and results from text searches.

For Version 5.0, the software developer completely recompiled, recoded and rebuilt Field Search to improve its compatibility with today’s hardware and software. Although those changes aren’t apparent to the end user, the end result still allows the software to run a complete scan of a hard drive, analyze the contents and produce a report in less than an hour – even though the hard drives of 2016 are much larger than those of 10 years ago, and even though the Field Search of 2016 has vastly expanded capabilities compared to those of the original version.

EXHIBIT 3: JUSTNET VISITS BY COUNTRY

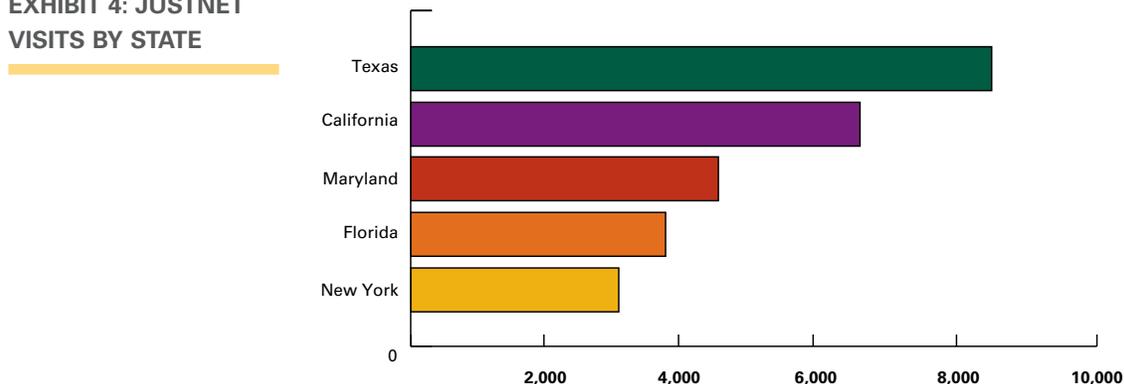




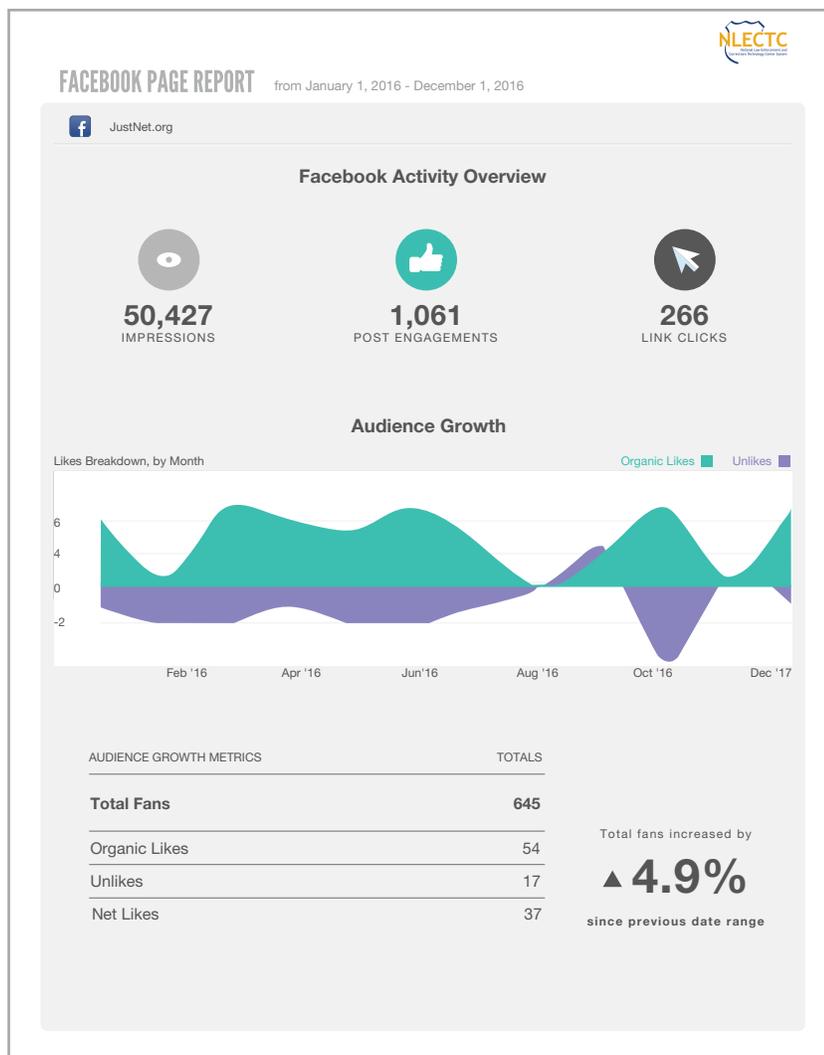
“Field Search was originally developed to help monitor sex offenders and protect children,” says Joe Russo, JTIC corrections technology subject-matter expert. Russo served as deputy director for corrections at the former NLECTC-Rocky Mountain Center during the software’s initial development, and later as the director of the Corrections Technology Center of Excellence through several upgrades. The developers have also provided numerous train-the-trainer sessions to criminal justice professionals over the years, equipping them to return to their agencies and share their knowledge as Certified Field Search Instructors. “As its use expanded into the law enforcement, military, border security and counterterrorism arenas, we realized the need and importance of providing quality tools for nontechnical users at no cost, and even after the initial funding ended, we remain committed to this project because it’s the right thing to do.”

Although many of Version 5.0’s changes run behind the scenes, it includes a number of new features and upgrades that will directly benefit users. One of the most significant expands the keyword search function to include the capability to search for a word or phrase in any language. Not just any language that uses the Latin alphabet; that function came with Version 4.0 in 2012 (see “In Any Language, Field Search Translates to Success,” *TechBeat*, Summer 2012, https://justnet.org/InteractiveTechBeat/summer_2012/FieldSearch.pdf.) Rather, Version 5.0 adds the capability to query in any language spoken on this planet, whether it uses the Latin alphabet, the Arabic, Cyrillic or Eastern language characters, or anything else.

EXHIBIT 4: JUSTNET VISITS BY STATE



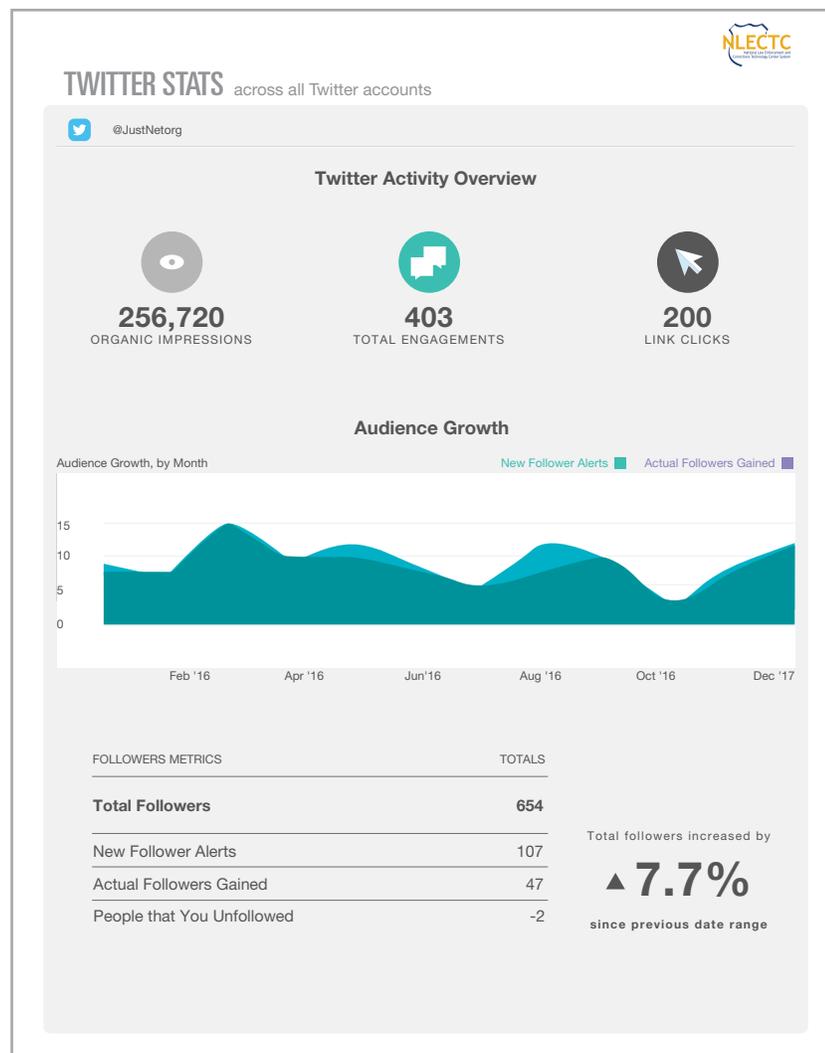
**EXHIBIT 5: JUSTNET
FACEBOOK STATISTICS**



“That’s a huge, huge change. We’re seeing more and more usage in investigations in domestic counterterrorism, and the U.S. military has been asking for this function for years,” Russo says. The military began training soldiers in the use of Field Search approximately five years ago for use in battlefield forensics to quickly analyze data when there is neither time nor ability to bring a recovered computer back to a lab.

CAUTION

EXHIBIT 6: JUSTNET TWITTER STATISTICS



A second major change adds chat history tools to allow users to examine activity for Skype, Windows Live, ICQ and Yahoo Messenger. The tool provides information on who the user sent messages to, what they said and when they said it. Another new addition is a search function that provides the ability to scan a drive for hits against HASH sets. A HASH, Russo explains, is a virtual “fingerprint” of a computer file. Each computer file, via a mathematical algorithm, produces a unique set of letters and numbers that identifies it; change one letter in a file or



one pixel in a picture, and the file generates a new HASH. The National Center for Missing and Exploited Children maintains a HASH database of all known child pornography files, and if a law enforcement agency has access to that database, analysts can use Field Search to compare the files on a computer hard drive and locate matches. This function can also tell probation and parole officers if clients have downloaded software they are not permitted to access.

Yet another significant change makes Field Search fully compatible with Windows 8 and 10, as well as the most current versions of Internet Explorer, Edge, Opera, Chrome and Mozilla Firefox. The software maintains compatibility with older versions as well.

Additional new features/upgrades include:

Pictures in the Image Gallery can now be sorted by date accessed, allowing Field Search users to see which pictures were accessed most recently.

- When a user is running Field Search off one computer and remotely searching a hard drive, the registry tool now pulls the registry information (e.g., when a drive was installed, the user's email address) from the remote drive rather than from the computer running the software. Russo explains that originally, Field Search was intended to be run only in the field, and thus would only need to look at the registry for the computer on which it was running. However, as computer forensic experts moved to using it for preliminary triage prior to using more sophisticated software, the need arose for an expanded registry tool.
- Improved reporting speed and greater ability to export reports as PDFs.
- Improved and faster media rendering.

“Digital evidence represents a critical element in the investigation of new crimes and also in the pre- and post-conviction supervision process. Most agencies appreciate this reality; however, many struggle with funding issues and as a result, lack capacity in this area,” says Russo.

“The upgraded Field Search software allows agencies access to an easy-to-use, yet powerful, forensics tool, and the best part is that it is completely free,” he says. “We are deeply indebted to the developers for their tireless dedication to the Field Search effort. They both have a deep



desire to support public safety and have each volunteered countless hours to improving Field Search and keeping it viable.”

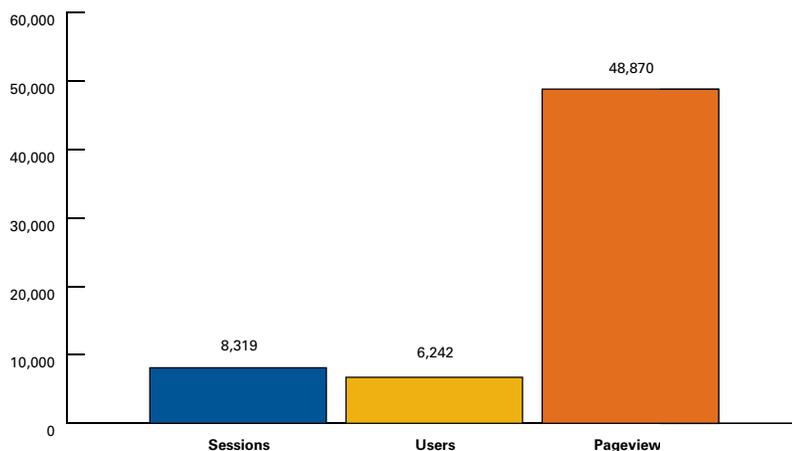
Field Search is available free of charge to qualified professionals. For more information on Field Search, including how to download a copy, please visit www.justnet.org/fieldsearch/fs_main.html.

Highlights

The efforts of JTIC create a focal point for information dissemination. Requests for information and assistance are relayed to the NLECTC Center, subject-matter expert or other agency that can best meet the request. From the position of the system hub, JTIC provides law enforcement, courts and corrections professionals with an entry portal to the system and its component centers through JUSTNET, the “Ask NLECTC” e-mail address (asknlectc@justnet.org) and the toll-free line at (800) 248-2742. These channels help JTIC fulfill its primary mission to offer criminal justice decisionmakers many ways in which to obtain information about relevant technology and related matters of interest.

JTIC’s ongoing efforts also support NIJ’s standards development and implementation and its Compliance Testing Program (CTP) (for more information about these activities, see “Registered National Institute of Justice Mark Indicates Compliance With Program Standards” on p. 19). The CTP ensures the safety and effectiveness of several types of equipment used by the public safety community.

**EXHIBIT 7:
POLICEARMOR.ORG
WEB ACTIVITY**





Highlighted activities include:

- Wrote several original articles published in external periodicals, including:
 - ““Safety and Security for Our Houses of Worship,” *Police Chief*, January 2016.
 - “Evaluating the Performance of Hand-held Cellphone Detectors in a Prison Setting,” *Corrections Today*, March/April 2016.
 - “Technology Update: New and Improved Field Search Software FS 5.0,” *Perspectives* (American Probation and Parole Association), Winter 2016 40:1 p. 20.
 - “Technology: Field Based Technology,” (Field Search), *Sheriff & Deputy*, May/June 2016, p. 78.
 - “Technology Update: Facilitating Offender Tracking Information Sharing,” *Perspectives* (American Probation and parole Association), Spring 2016 40:2 p. 20.
 - “Eyes in the Skies: The Latest Threat to Correctional Institution Security,” *Corrections Today* (American Correctional Association), November/December 2016 78: 6 p. 47.
 - “Taking a Stab at It: Mitigating Knife and Stab Threats Through a Revised Standard,” *Sheriff & Deputy*, November/December 2016.
- Designed, wrote and produced 10 issues of *TechBeat*, the online newsletter of the NLECTC System, which moved to a monthly publication schedule starting in January 2016 (combined issues were produced for July/August and November/December). At the end of 2016, *TechBeat* had 29,857 subscribers.
- Managed JUSTNET, the website of the NLECTC System, which had 86,560 sessions by 57,761 users and 247,406 pageviews during the year.
- Processed 13 “asknlectc” email box external request referrals and 1,074 internal information request referrals, as well as 117 toll-free telephone internal information referrals and 23 external information referrals.



- Through the CTP, provided oversight and administration for the testing of 113 models of ballistic-resistant body armor and 17 models of stab-resistant armor; also conducted follow-up inspection and testing of 188 models of ballistic-resistant body armor.
- Provided meeting coordination, subject-matter expertise and/or technical writing/editing support for one onsite Special Technical Committee meeting on ballistic-resistant body armor.
- Exhibited at 27 national law enforcement and corrections conferences, distributing 6,215 items from inventory. An additional 2,290 NLECTC System publications were distributed by other agencies at six additional conferences.
- In conjunction with the Michigan State Police, conducted evaluations of 2016 model year police vehicles (13) and motorcycles (five, one an electric bike) from four manufacturers.
- Handled 183 non-conference-related requests for publications.
- Designed, edited and/or produced 58 publications.
- Recorded 2,582 contacts, 1,013 transactions and 53 orders into CaptureNet. (After April 2016, orders were counted with transactions for reporting purposes.)
- Processed 34 ASTM portal requests, 340 School safe app requests and 87 Safeguarding Houses of Worship app requests.
- Coordinated 589 total (approved, rejected and new) requests for Field Search software. To date, 7,920 requests have been received and the software has been downloaded a total of 12,883 times. Certified Field Search instructors provided basic Field Search training to 614 criminal justice personnel and staff approved 517 requests for the Field Search software.
- Managed the Corrections Technology Resource Center, which has a total of 781 registered users to date. The knowledgebase contains 1,491 documents.
- Produced 51 issues of *JUSTNETNews*, a weekly summary of news from the NLECTC System, NIJ and other agencies within the U.S. Departments of Justice and Homeland



Security; abstracts of mass media articles relating to criminal justice technology; and current funding opportunities and upcoming events. At the end of 2016, *JUSTNETNews* had 21,928 subscribers.

- Managed PoliceArmor.org, a subsite that provides overall information on both ballistic- and stab-resistant armor for field officers, and includes links to the CTP information on JUSTNET. PoliceArmor.org had 8,319 sessions by 6,242 users and 48,870 page views in the final six months of the year.
- Managed SchoolSafetyInfo.org, a website targeting school resource officers and school administrators that links to resources, a calendar of events, funding opportunities and original articles on free/low-cost school safety activities. Staff wrote 15 articles for the website and produced Volume 4 in the *Sharing Ideas and Resources To Keep Our Nation's School Safe!* series, which compiles one year's worth of articles posted to the site. SchoolSafetyInfo.org had 10,992 sessions by 8,662 users and 44,962 page views in the final six months of the year.
- Disseminated information to the criminal justice decisionmaker community via the JUSTNET's Facebook page (with 645 fans and 50,427 impressions) and Twitter feed (with 654 followers and 256,720 impressions) in 2016. JUSTNET's YouTube channel had 10,475 views with 31,413 minutes watched. Original videos produced during the year included:
 - Eyes in the Sky: How Law Enforcement Uses Unmanned Aircraft Systems.
 - School Safe Tutorial.
 - Kenya Wildlife Service Aviation Technology Project.

For additional information on the Justice Technology Information Center, contact Mike O'Shea, NIJ senior law enforcement program manager, at michael.oshea@usdoj.gov.



STANDARDS AND TESTING

Registered National Institute of Justice Mark Indicates Compliance With Program Standards

“Buyer Beware!” a 2011 brochure produced by the National Law Enforcement and Corrections Technology Center (NLECTC) and the National Institute of Justice (NIJ), warned criminal justice professionals to check and double-check whether a specific model of ballistic-resistant body armor had gone through the NIJ Compliance Testing Program (CTP) by asking to see the statement of compliance on its label, and also by visiting NLECTC’s JUSTNET website to ensure the armor is listed on the Compliant Products List (CPL). As of October 2016, practitioners have a simpler way of double-checking as the NIJ CTP phases out the compliance statement and replaces it with the new, simpler, more recognizable NIJ Mark of Compliance.

The NIJ CTP independently evaluates criminal justice equipment for compliance with NIJ performance standards, then communicates compliance status through both a published compliant products list and a statement of compliance applied to the equipment. NIJ has now begun authorizing ballistic-resistant body armor manufacturers to move from using the statement of compliance to using the NIJ Mark.

Using the Mark will improve criminal justice practitioners' ability to identify body armor that has been manufactured under the oversight of the applicable NIJ CTP surveillance program. Registering the Mark with the U.S. Patent and Trademark Office establishes rights that provide certain legal protections against misuse by manufacturers; the statement of compliance did not have these protections and was susceptible to manipulation by manufacturers. (In the past, some manufacturers created statements very similar to the NIJ CTP statement of compliance that implied participation in the NIJ CTP. Thus, some criminal justice practitioners may have mistakenly purchased armor that did not participate in the NIJ CTP, according to NIJ Senior Law Enforcement Program Manager Mike O'Shea.)



“The NIJ Mark indicates that the ballistic-resistant body armor model to which it has been applied has been determined by the NIJ CTP to be compliant with the current version of the NIJ ballistic-resistant body armor standard. By placing the NIJ Mark on the armor, a manufacturer declares that the armor was both constructed in the same manner as the original test items evaluated by the NIJ CTP, and assembled under the NIJ CTP’s surveillance program that periodically inspects and tests production samples,” says O’Shea. “Even with the addition of the Mark, we still recommend that criminal justice agencies go to JUSTNET and verify the armor’s status by checking the CPL.”

Manufacturers must complete legal agreements and have draft labels approved for production before they begin placing the NIJ Mark on production units. O’Shea expects it to take several months before all manufacturers complete the necessary processes and paperwork, but it is likely that by early 2017 all newly produced compliant armors will carry the NIJ Mark.

“I believe manufacturers will jump on it just as quickly as they possibly can because the NIJ Mark will help to differentiate their products from armors that have not been independently tested and evaluated by the NIJ CTP,” he says.

Manufacturers have received specific implementation guidance through a revised Applicant Agreement and NIJ CTP Product Conformity Assessment System documents (<https://justnet.org/howto/NIJ-Mark.html>).



WHAT A LABEL SHOULD INCLUDE

In addition to the NIJ Mark, an NIJ CTP-approved label should include a number of other elements, some of which are listed below (manufacturers receive a more detailed list that includes specifics on type size, label appearance and so on).

1. Name, logo or other identification of listed company.
2. Model designation as it appears on the manufacturer's Notice of Compliance.
3. Applicable standard version.
4. Rated level of protection, referencing the standard.
5. Size (name of individual if custom-fitted).
6. Serial number.
7. Lot number.
8. Location and date of manufacture.
9. Date of issue (filled in by user).
10. Length of warranty and point of contact for warranty information.
11. Declaration as to whether the armor provides ballistic protection, stab/slash protection or both.
12. Clear identification of either strike face or body side.
13. Care instructions.

(Listed Company's) Name
(Listed Company's) Address

Model: _____



NIJ Standard-0101.06

Threat Level (NIJ 0101.06): _____

Size: _____

Serial Number: _____

Lot Number: _____

Location of Manufacturer: _____

Date of Manufacture: _____

Date of Issue: _____

Manufacturer's Ballistic Performance Warranty Period: _____

For Warranty Information Contact: _____

WARNING!

This garment is rated **ONLY** for the ballistic threat level stated above. It is **NOT** intended to protect against rifle fire or sharp-edged or pointed instruments.

** Wear Face **
This side to be worn against body.

Care Instructions for Ballistic Panel:
(Sample Instructions Shown):

1. Do not wash or dry clean.
2. Wipe with a damp cloth.

Draft Revisions to Ballistic-Resistant Standard Address Needs of the Field

With the release of *Ballistic Resistance of Body Armor NIJ Standard-0101.06* in 2008, NIJ and its CTP launched a new era in body armor testing, one that for the first time included testing armor that had been subjected to a rigorous conditioning protocol and greatly expanded the number of armor panels put through the testing process. With the introduction of the Follow-up Inspection and Testing (FIT) program in 2011, the CTP began providing oversight of the first-ever testing of production samples of ballistic-resistant models listed on the CPL.

Yet, not long after the FIT program got underway, in June 2012, NIJ began making plans to develop the next iteration of the standard. A Special Technical Committee (STC) composed of practitioners (public safety professionals who use and are knowledgeable about ballistic-resistant body armor), test laboratory staff and subject-matter experts from NIJ, the CTP and other agencies began meeting in February 2013 to discuss revisions needed for the upcoming NIJ Standard-0101.07. Plans call for a draft of that standard to be released for public comment in 2017 via JUSTNET.



“NIJ 0101.06 represented a significant step forward in relation to the amount of data collected and the additional testing imposed on armor to provide confidence in its performance in the field,” says Dan Longhurst, JTIC standards coordinator. “Since its introduction in 2008, operational needs have changed and experience administering the standard has identified areas for potential incremental improvements.”

Longhurst notes that unlike the major changes of NIJ Standard-0101.06, the latest revisions will consist mainly of refinements and clarifications, many of which will impact only the test labs and the CTP. Changes affecting law enforcement agencies and officers in the field fall mainly in the areas of protection levels, type of ammunition used in testing, vocabulary refinements and testing of female armor.

Over the past several years, NIJ has convened several focus groups of female officers to help inform the development of a test protocol specific to female armors, and CTP staff engineers have used that input to help them devise new and appropriate test methods.

“Because manufacturing techniques have improved to accommodate female officers with more comfortable armor that provides better coverage, the standard needs to ensure that these armors are adequately tested to the same rigor as flat armor has been tested in the past. This includes assessing different-sized bust cups and cup production techniques,” Longhurst says. “It also requires that shot placements and angles are specified in such a way as to ensure consistent and reliable testing.”

The ammunition used to take those shots has also been a subject of extensive discussion in STC meetings; the standard specifies not only the caliber of ammunition, but also the specific manufacturer and model for quality control purposes. One proposed change would introduce the use of 7.62 x 39 mild steel core (MSC) and 5.56 mm M855 ammunition into hard armor plate testing. The ammunition specified in NIJ Standard-0101.06 represents a large gap between the two existing levels of hard armor protection, and bringing these two types of ammunition into the test matrix will help close that gap and provide a better base level of protection for officers.



The STC has also discussed changing protection level names of those hard armor plates and the soft armor vests as well, with a goal of providing greater clarity through nomenclature that instantly identifies the type of protection offered. Also, changing names would provide demarcation between the new standard and previous iterations. And regardless of the names finally chosen, this version of the standard will retire Level IIA, the lowest level of soft armor protection.

“Serving officers on the STC feel that the protection that it offers is considered too low for the threats commonly faced on the street,” Longhurst says. Level IIA accounts for only 7 percent of the armor models currently listed on the CPL, an indication that agencies have little interest in purchasing armor built at this lower protection level.

When it comes to purchasing armor at any level, agencies sometimes are hindered by confusing vocabulary, with manufacturers, labs, practitioners and government agencies all using the same term to mean different things, or using different terms to describe the same thing. In order to foster more consistent use of terminology, NIJ Standard-0101.07 will include only a truncated section of definitions and will instead reference the newly released ASTM E3005-15 Standard Terminology for Body Armor. As a service to the criminal justice community, NIJ provides free access to this and other ASTM standards through a portal on JUSTNET. For more details and to apply to obtain access, visit https://justnet.org/NIJ_ASTM_Standards_Portal.html.

“NIJ has used input from the field to inform the development of the draft revision to the ballistic standard, and will collect even more during the public comment period. The goal is to ensure that the standard meets the needs of those working in the criminal justice field,” Longhurst says.

Sign up to receive JUSTNETNews, the weekly email newsletter of the NLECTC System, or follow NLECTC on Facebook or Twitter, to find out as soon as the standard is released for public comment. To find out more information and to sign up, visit JUSTNET at www.justnet.org.



Developing the Next Generation Stab-Resistant Body Armor Standard

Correctional officers face danger and challenges to their safety on the job. Inmates are creative and inventive in fashioning improvised stab and slash weapons from everyday objects or materials they have access to within a facility. These weapons may be wooden, plastic or metallic and can be used to attack an officer. Examples of weapons recovered from correctional facilities include handmade spikes, shanks and blades, and even toothbrushes sharpened for stabbing or reshaped to hold razor blades for slashing.

To better address current stab and slash threats faced by U.S. correctional officers, NIJ is developing an update to the 2000 NIJ standard for stab-resistant body armor, *Stab Resistance of Personal Body Armor NIJ Standard-0115.00*, which was adapted from a United Kingdom standard that primarily addressed the threat from commercially made knives.

The revised standard, which is in draft with the working title of *Stab and Slash Resistance of Personal Body Armor NIJ Standard 0115.01*, specifies minimum requirements for stab- and slash-resistant torso armor and includes testing specific to armor designated as female armor. The draft standard addresses body armor panels that are intended to provide protection against stab (knife and spike) and slash threats.

As envisioned, the draft standard will provide two performance categories for stab/slash-resistant armor based on mission requirements and threats anticipated within the operational environments:

- Commercially made weapons, typically encountered outside of controlled access facilities, but including the jail intake area and public areas.
- Improvised, or inmate-made weapons, typically encountered inside of controlled access facilities, including jails, detention centers and prisons.



Development of the type of test weapons (exemplars) for the draft standard is based on the types of improvised weapons confiscated or found within correctional facilities.

“Typically in a standard development process, first we hold a focus group with practitioners to discuss needs and requirements, and correctional officers were asking if the armor could be re-engineered to be lighter and more breathable,” explains Jack Harne, NIJ corrections technology program manager. “To assess the types of threats, we reached out to corrections agencies and collected about 1,500 weapons made by inmates within corrections facilities, and assessed them relative to composition, hardness, sharpness and other criteria to develop exemplars to use for testing in the standard.

“We also included a slash test component due to the fact that through research we discovered that many of the assaults on inmates and staff were of a slashing motion with slash-type wounds, so we wanted to include a slash testing protocol in the standard.”

Although the test weapons are specially designed to ensure consistency in testing procedures, they reflect many of the features found in the commercial knives or homemade instruments most commonly used in attacks. Test knife and spike exemplars representing commercially made weapons are similar to those used in the 2000 standard. Under the draft standard, stab-resistant body armors, whether designed to protect against improvised threats or commercial threats, will need to provide stab, spike and slash protection.

It is hoped that the end result will be protective armor for correctional officers that will be more applicable to the environments they work in without burdening officers with protection against threats that are not applicable.

“The exemplars that are characteristic of the improvised weapons made by inmates are more representative of those found in the working environment,” Harne says. “Although we do not engage in designing armors, it is hoped that industry will be able to tailor armors to meet the new threats and hopefully improve comfort of the equipment.”



In addition, armor models designed specifically to accommodate the female physique will undergo additional testing to ensure adequate protection, particularly in areas that have been formed to fit the female bust area.

The standard also covers labeling requirements, which is important to practitioners because they need to know what the armor can do and what it protects against. The ability to continue to read the label as the armor is worn and used over time is significant for a number of reasons, including needing to know pertinent information such as model number in the event of a recall, and protection level.

For more information on the effort to revise the stab-resistant armor standard, contact Jack Harne, NIJ corrections technology program manager, at jack.harne@usdoj.gov. For additional information on the NIJ ballistic-resistant body armor standard effort and the Compliance Testing Program, contact Mike O'Shea, NIJ senior law enforcement program manager, at michael.oshea@usdoj.gov.



SCHOOL SAFETY

JTIC Assistance Helps Topical Working Group on State School Safety Issues Inform Future Direction of Comprehensive School Safety Initiative

The National Institute of Justice launched the Comprehensive School Safety Initiative (CSSI) in 2014, with a goal of improving the safety of the nation's schools and students through rigorous research that produces practical knowledge, to be accomplished through partnerships that include, among others, educators, researchers, law enforcement, and behavioral and mental health professionals. When the CSSI team set out to hold a nationwide meeting in February 2016 that brought together representatives from state school safety centers to discuss the issues, challenges and barriers they face, they sought editorial assistance and support from the NLECTC center that had maintained a school safety website and produced school safety publications since 2012: the Justice Technology Information Center (JTIC).

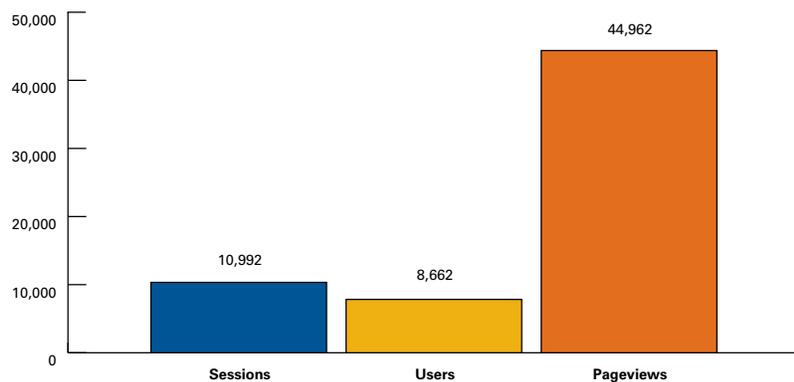


With approval from NIJ Senior Law Enforcement Program Manager Mike O’Shea, JTIC technical writer Becky Lewis traveled with the CSSI team to Santa Fe, N.M., to take notes during the two-day event and provide assistance in the form of a written report that CSSI staff used to help inform policy direction for the remainder of the year.

Dr. Phelan Wyrick, director of NIJ’s Crime and Crime Prevention Research Division and CSSI program manager, described the meeting in this way: “We’re having a dialogue and we’re trying to learn from each other as school safety professionals. We want to know what are the challenges that you face and the things that keep you up at night. We’re trying to learn because our job under CSSI is to build knowledge and better understand the effect of programs, policies and practices, and to conduct research on how to be effective in reducing violence.”

Participants spent time sharing information about their needs and learning more about resources offered by NIJ and other federal government partners, with details captured in the 40-page meeting report. Through guided panel discussions and focus groups, they provided NIJ with the information needed to help CSSI move forward, and through networking, they also forged relationships that would enable them to “share ideas and resources” when they returned to their centers, a theme that is also the driving one behind JTIC’s *Sharing Ideas and Resources to Keep Our Nation’s Schools Safe!* publication series. In addition to assisting

**EXHIBIT 8:
SCHOOLSAFETYINFO.ORG
WEB ACTIVITY**





NIJ by writing the meeting report, Lewis also gave a brief presentation on JTIC school safety resources, distributed print materials and flash drives, and through networking, made connections that allowed her to later write three articles for SchoolSafetyInfo.org: “SPK UP NC Offers Anonymous Way to Help,” “Missouri Integrates Emergency Operations Into ‘1Plan’” and Missouri School Bus Driver Training Emphasizes Situational Awareness, Communication Skills.” The first two articles also appear in Volume 4 of *Sharing Ideas and Resources*; the third will appear in 2017’s Volume 5. (The publications compile articles published on SchoolSafetyInfo.org on an annual basis.)

As he did in his welcome, Dr. Wyrick also emphasized the importance of the “sharing ideas and resources” theme in his closing remarks: “Many of you mentioned ‘stealing ideas.’ That’s 90 percent of what we do at the federal government; I call it ‘sharing from you.’ We spend a lot of time looking for good ideas at the state and local levels, and our federal role is largely just reflecting that back to you. You should never feel bad about ‘stealing’ or ‘sharing from.’ Collaboration is the most important part of this.”

And just like CSSI, that’s what JTIC does with the SchoolSafetyInfo.org website and the *Sharing Ideas and Resources* volumes.

School Safety App Popularity Continues to Grow

Launched in late 2015, School Safe – JTIC’s Security and Safety Assessment App for Schools, takes users step-by-step through buildings and school grounds to identify and address trouble spots. The free app allows school safety resource officers (SROs) and school administrators to conduct a physical campus assessment by walking around and answering a series of simple questions using a hand-held device. Available in both IOS and Android versions, access to the app can only be obtained after requestors have been vetted by JTIC staff. During 2016, staff processed 340 requests for the app, including a September/October spike of 287 requests due to a mention of the app in OJJDP’s *JuvJust* e-newsletter, as well as an article in the October 2016 issue of the *School Safety and Security Alert* newsletter.

JTIC staff also added 15 new articles to SchoolSafetyInfo.org and kept resources, funding opportunities and calendar of events listings current. The site registered 10,992 sessions by 8,662 users and 44,962 page views. In addition, Sean Burke of the School Safety Advocacy

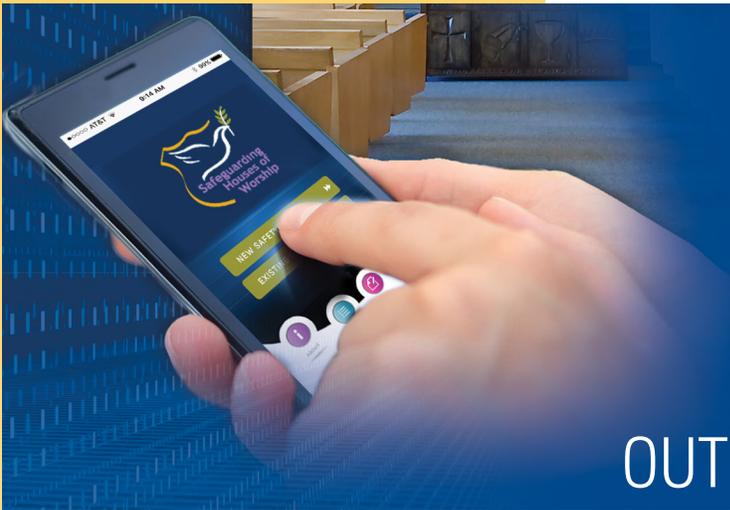


Council joined JTIC staff on a subcontract basis as a school-safety subject-matter expert, and represented JTIC at a number of school safety conferences and meetings. He also provided school safety-related assistance in developing the Safeguarding Houses of Worship app (see page 30).

For additional information on JTIC's school safety-related efforts, contact Mike O'Shea, NIJ senior law enforcement program manager, at michael.oshea@usdoj.gov.

NLECTC Centers Produce School Safety Publications

In addition to JTIC's ongoing efforts to keep the SchoolSafetyInfo.org website current (including a redesign effort launched late in 2016 that will come to completion in 2017), both the Criminal Justice Priority Technology Needs Initiative and the National Criminal Justice Technology Research, Test, and Evaluation Center produced extensive research reports on the current status of school safety technology in the United States. More details about those publications are provided on p. 63 and p. 71, respectively.



OUTREACH

New NIJ App Helps Houses of Worship Plan for Safety

To help houses of worship (HOW) plan and become prepared to handle all types of emergencies, the National Institute of Justice (NIJ) released *Safeguarding Houses of Worship*, an app that helps a HOW assess its risk factors and start a draft plan that can be expanded and customized to meet its specific needs.

Distributed through NIJ's Justice Technology Information Center (JTIC) to vetted public safety professionals, the Safeguarding Houses of Worship app can be a way for local law enforcement agencies to connect with HOW in their jurisdictions. Whether the agencies choose to work with HOW on a one-to-one basis or hold local workshops/planning meetings to discuss the need for a safety plan, the availability of the app helps law enforcement agencies work together with HOW to make communities safer.



“It isn’t just an assessment tool; it actually helps HOW write a plan,” says Ron Pierce, JTIC Deputy Director. “It provides guidance on the issues they should address and includes boilerplate policy language that gives them a good pathway to creating an expanded policy that meets their needs.”

Safeguarding Houses of Worship guides a user through a series of questions designed to assist a HOW in evaluating the current safety and security posture of a campus, as well as prioritizing threats and making recommendations for improvement. Template text provides assistance with developing job descriptions and policies and procedures; as Pierce notes, the template text can then be revised, expanded and customized. Users are cautioned that safety plans are living documents that a HOW should periodically review and update as needed.

Safeguarding Houses of Worship builds, and expands on, design principles used by JTIC in creating School Safe – JTIC’s Security and Safety Assessment App for Schools, released in October 2015 to assist schools with performing security assessments of their campuses. (See “School Safety App Popularity Continues to Grow,” p. 29.) NIJ and JTIC were working on the development of the school app in October 2014 when Todd Coleman approached them with the idea to create a tool for HOW. Realizing that the school app could be a foundation for meeting the need brought to their attention by Coleman, NIJ hired him as a consultant for the project and the process to develop Safeguarding Houses of Worship got underway.

Coleman, a scientist who has worked in the area of law enforcement for more than 20 years and as a reserve deputy sheriff in Columbia County, Ga., for 15 years, attends an urban church in downtown Augusta, Ga. When his congregation decided the time had come to create a safety and security plan, members scoured the Internet for a tool that would help them develop one, and although they found a great deal of resource material, they couldn’t find a tool that would help them create a plan. Ultimately, the congregation wrote a plan without such assistance, but Coleman couldn’t help thinking that there were other HOW that might find the task too daunting to start without some type of assistance.

“I asked if there was interest in creating an automated process that would produce a draft plan, and NIJ went with it,” Coleman says. “We started by convening two panels of experts consisting of law enforcement representatives and HOW administrators. We quickly learned that while each of us knew how our own campuses operate, we had to learn about the differences.”



The panels had online meetings two weeks apart, and in between the two meetings, the June 17, 2015, shooting at the Emanuel African Methodist Episcopal Church in downtown Charleston, S.C., where nine people were killed, took place.

“It really hit home for me, not just because we were working on the app, but because people from my church knew people from Charleston,” Coleman says. “The shooting reminded everyone about the ongoing need and the urgency to get the app out.”

Input from the panels helped inform the content, and the JTIC team worked with an app developer for the next 15 months to create a prototype, a beta test version and the final product.

Safeguarding Houses of Worship walks the user through a series of questions and answers, marking a floor plan with critical points such as gas and water shutoff valves, taking an inventory of emergency management skills in the congregation and implementing recommendations on training for dealing with medical incidents, serious weather situations and missing children. It also asks users to weigh risks from specific hazards such as earthquakes, wildfires and nearness to a potential hazard such as a dam or a nuclear facility, and offers a glossary of relevant terms as well as sample forms for handling a bomb threat call, stocking a medical trauma kit and more.

“As we began the development process, we came across FEMA’s *Guide for Developing High-Quality Emergency Operations Plans for Houses of Worship* and became aware of ongoing efforts to assist HOW at DHS and FEMA,” Pierce says. (See *TechBeat*, March/April 2015, https://www.justnet.org/InteractiveTechBeat/eTECHBEAT/eTechbeat_MarApr_2015/index.html). “After Charleston, there was quite a bit of interest generated in the app, and we began pushing to get it out as quickly as possible.”

Pierce experienced some of that interest firsthand when he attended a summit meeting on safety and security for HOW at Augusta University in November 2015. Among the participating organizations, he saw “great interest in what FEMA had done already and in what the app could do for them. Many of them had started plans that included fire drills, but they didn’t touch on how to deal with a lost child or an active threat, and they hadn’t thought about assessing their specific risk factors.”



Now, with the availability of Safeguarding Houses of Worship, HOW can assess these risk factors and create job descriptions, draft policies and more, all as part of an effort to keep their campus and the community safe.

For more information and for instructions on obtaining the app, visit https://www.justnet.org/resources/Houses_of_Worship.html or contact Ben Bolton of JTIC at asknlectc@justnet.org.

Highlights

Throughout the year, the various centers that make up the NLECTC System spread the word about technology innovations and answered questions from the field by exhibiting, presenting and attending a variety of events, and presenting a number of webinars and trainings. A summary follows.

January

Florida Police Chiefs Association. JTIC subcontract staff distributed 1,185 items from the NLECTC inventory at the Florida Police Chiefs Mid-Winter Training Conference and Exposition Jan. 9-12, 2016.

Body-worn Camera Conference. JTIC staff attended a meeting on body worn camera use in Washington, D.C., on Jan. 21, 2016, which was sponsored by the International Chiefs of Police and the Police Foundation. This invitation-only forum featured active, open dialogue along with insightful presentations providing a unique opportunity for the law enforcement community to discuss important and complex issues as they work to implement trusted, secure and manageable body-worn camera programs in their jurisdictions.

Indiana Association of Chiefs of Police. JTIC staff attended and exhibited at the Indiana Association of Chiefs of Police Mid-Winter Conference on Jan. 27, 2016. Staff distributed a total of 54 items.

ASTM Winter Meeting. On Jan. 24-27, 2015, JTIC staff participated in the mid-winter ASTM International meeting in San Antonio, Texas, via WebEx because of being unable to travel due to the January 22-23 blizzard that impacted the Washington, D.C. area. The JTIC materials



scientist participated as a subject-matter expert in the area of body armor to assist the ASTM E54 Homeland Security Applications committee with developing related standards. In addition, he will lead the effort to develop a ballistic-resistant shield standard for law enforcement. The JTIC standards coordinator chaired a committee on Backface Deformation Measurement of Planar Armor, and attended the following subcommittees as an SME: Ballistic Range Configuration, Protective Gloves for Law Enforcement, Ballistic-Resistant Head Protection for Law Enforcement, Hard Armor Conditioning, Non-planar Test Items, Assessment of Penetration Resistance and Backface Signature, Ballistic Protective Materials and Body Armor Program Management. All of these projects support ongoing efforts sponsored by NIJ to develop or update performance standards for protective equipment used by public safety professionals.

February

Washoe County (Nev.) Schools. The JTIC school safety subject-matter expert gave a presentation on Feb. 2, 2016, in the Washoe County (Nev.) Public Schools. The presentation included a review of JTIC school safety services. He also distributed JTIC school safety materials to the Washoe County Schools Safety and Climate Committee and the chief of the Washoe County School District Police Department.

National Sheriffs Association Winter Conference. JTIC staffed exhibited at the National Sheriffs Association Winter Conference in Washington, D.C., Feb. 7-8, 2016. Special focus was placed on promoting the School Safe app and the then-upcoming Safeguarding Houses of Worship app. JIC staff also attended the event.

American Association of School Administrators National Conference on Education. The JTIC school safety subject-matter expert exhibited at the American Association of School Administrators National Conference on Education on Feb. 10-12, 2016, in Phoenix. He discussed training and resources available to schools from JTIC with attendees, and provided information on the School Safe app.

2016 National Conference on Bullying and Child Victimization. JTIC staffed exhibited at the School Safety Advocacy Council's National Conference on Bullying and Child Victimization in Orlando, Fla., on Feb. 22-24, 2016. Emphasis was placed on the School Safe app, which resulted in numerous follow-up requests. Staff distributed about 75 percent of publications brought, much higher than the usual 50-percent distribution percentage.



American Academy of Forensic Sciences Conference. The FTCoE hosted two events in conjunction with the 68th Annual American Academy of Forensic Sciences Scientific Meeting Feb. 22-27, 2016, in Las Vegas.

- February 22-23: Hosted Organization for Scientific Area Committees Public Status Reports & Open Discussions, which focused on OSAC's recent activities and updated priorities. All 29 presentations and questions from the audience were webcast live and archived for future on-demand viewing. A total of 146 in-person and 381 online users attended. The archived version of the event can be found on the FTCoE website.
- February 23: Co-hosted the NIJ Forensic Science Research and Development (R&D) Symposium, a free, all-day, open meeting where attendees learned about NIJ-funded research across a variety of forensic science areas. A total of 222 in-person and 51 online users attended.

March

Texas Chiefs of Police Annual Conference. JTIC staff exhibited at the Texas Chiefs of Police Annual Conference in Austin, Texas, from March 21-24, 2016. The event was well attended and traffic at the exhibit was heavy. The Center plans to participate in the event again in 2017. Staff distributed 127 items from the NLECTC inventory.

April

Advisory Panel on Electronic Monitoring. The JTIC corrections subject-matter expert participated in an advisory panel on electronic monitoring organized by the PEW Charitable Trusts and held on April 13-14, 2016, in Washington, D.C. The panel reviewed PEW's initial work in the area of electronic monitoring and provided guidance on future direction, research needs and agencies that potentially would be interested in participating in future studies.

National Association of School Boards Annual Conference. JTIC staff exhibited at the National Association of School Boards Annual Conference from April 8-11, 2016, in Boston. More than 6,000 school board members attended the event, and visitors to the booth were especially interested in the School Safe app and in the SchoolSafetyInfo.org website. Staff distributed 383 items from the NLECTC inventory.



Virginia Department of Criminal Justice Services/Maryland Center for School Safety Seminar. JTIC staff exhibited at “The Briefings: Life after School Tragedy,” a school safety seminar hosted by the Virginia Department of Criminal Justice Services and the Maryland Center for School Safety on April 18, 2016, in Alexandria, Va. Attendees expressed interest in the School Safe app and the SchoolSafetyInfo.org website. Staff distributed 273 items from the NLECTC inventory.

American Society of Crime Laboratory Directors Annual Symposium. The FTCoE exhibited at the 43rd annual ASCLD Symposium April 24-28, 2016 in Bellevue, Wash. This meeting had more than 280 attendees and more than 60 exhibitors. This year’s theme was centered on “inspiring employees for maximum performance and how to foster a culture of excellence” in a forensic organization. Throughout the week, crime lab leaders presented actionable tools and information to crime lab leadership to take back to their lab and continue the pursuit of excellence in all aspects of operation. The FTCoE provided a flyer to ASCLD attendees highlighting many FTCoE activities and resources.

Metropolitan Washington Council of Governments Body-worn Camera Working Group Meeting. On April 26, 2016, the JTIC outreach coordinator provided subject-matter expertise to Washington, D.C. area law enforcement agencies regarding their adoption and implementation of body-worn cameras during the COG subcommittee meeting.

Metropolitan Washington Council of Governments Biometrics Subcommittee and Police Technology Subcommittee Joint Meeting. On April 27, 2016, the outreach coordinator provided subject-matter expertise to Washington, D.C. area law enforcement agencies regarding the adoption of facial recognition software and video analytics during the COG subcommittee meeting.

May

Ohio Association of Chiefs of Police Annual Conference. JTIC staff exhibited and interacted with technology vendors and conference attendees at the Ohio Association of Chiefs of Police Annual Conference, May 1-3, 2016, in Columbus. Visitors to the booth picked up 96 materials from the JTIC inventory, with the most popular item being the JTIC flash drive (40).



Law Enforcement and Public Safety Technology Forum. JTIC staff exhibited at the Law Enforcement & Public Safety Technology Forum sponsored by the Armed Forces Communications and Electronics Association on May 9-10, 2016, in Washington, D.C., held as part of the Police Week observances, and distributed 25 informational brochures on the Bulletproof Vest Partnership.

Technologies in International Forensic Radiology Research Summit. The FTCoE co-hosted an International Forensic Radiology Research Summit in Amsterdam, the Netherlands on May 9-10, 2016. This summit convened a working group of world-renowned researchers with the goal of establishing an agenda of high-need areas of research within medicolegal death investigation, specifically forensic radiology and imaging. In order to increase the depth of knowledge and expertise represented at the summit, this meeting occurred in conjunction with the 2016 Joint Congress of the International Society of Forensic Radiology and Imaging and the International Association of Forensic Radiographers. NIJ, Netherlands Forensic Institute (NFI), Co van Ledden Hulsebosch Centre (CLHC), Academic Medical Centre (AMC), University of Amsterdam (UvA) and the FTCoE assembled 40 researchers and practitioners from 14 countries and five states to build research partnerships and work collaboratively toward the goal of establishing a global forensic medicine research agenda. Following the summit, the collaborative effort will continue and publication of the research agenda is planned for the Spring 2017 issue of the *Journal of Forensic Radiology and Imaging*.

Statistical and Applied Mathematical Sciences Institute Working Group on Forensic Sciences. The FTCoE has had a staff member on two of the Statistical and Applied Mathematical Sciences Institute working groups in forensic science over the past year. These working groups focus on evaluating quality metrics for latent fingerprints and developing general principles that can be followed to choose an appropriate database for considering forensic evidence. During May 2016, these two individuals from the FTCoE gave presentations and one participated in a discussion panel at SAMSI's final forensic transition workshop at SAMSI headquarters in Research Triangle Park on May 9-11, 2016. Presentations covered "Generic Principles for the Selection of Databases to Represent the Background Population" and "Technology Transition Through the Forensic Technology Center of Excellence." Both presentations are available on the SAMSI website (<https://www.samsi.info/programs-and-activities/research-workshops/2015-16-forensictransition-workshop-may-9-11-2016/>).



North Carolina International Association of Identification. The FTCoE presented at the North Carolina International Association of Identification Annual Training Conference May 11-13, 2016, on “Understanding and Calculating Error Rates in Pattern Evidence.” The presentation detailed how error rates are calculated with an emphasis on some commonly reported error rates for pattern evidence, and discussed how they should be used in the courtroom. In addition to the lecture, the FTCoE hosted a half-day workshop titled “Latent Prints Testimony: How to be Transparent Without Feeling Naked,” which detailed how to address challenging concepts that arise in court, taking into account error rate, discriminability, certainty, variability, bias, uniqueness and the context of the relevant population.

Corrections Technology Association Conference. The JTIC corrections subject-matter expert delivered a workshop presentation titled “Offender Tracking: It’s All About to Change” at the Corrections Technology Association conference in Scottsdale, Ariz., on May 16-17, 2016. Approximately 25 to 30 people attended the presentation. Staff also exhibited at the JTIC booth, distributing 72 materials from the JTIC inventory. The most popular item was the JTIC flash drive (40).

Statistics and Applied Mathematics in Forensic Science Analysis Technology Transition Workshop. The FTCoE hosted a technology transition workshop on the topic of statistics and applied mathematics in forensic science analysis on May 17-19, 2016, for professionals within the criminal justice system. The workshop’s goal addressed learning how to apply statistics and probability theory to different areas of forensic science including drug analysis, toxicology, trace evidence and pattern evidence. Due to the popularity of this workshop, the FTCoE plans to host a repeat event or a “Part 2” in the future.

American Jail Association Conference. JTIC staff exhibited and interacted with technology vendors and conference attendees at the American Jail Association Conference in Austin, Texas, on May 23-24, 2016. Visitors picked up 74 items from the JTIC inventory, including 48 JTIC flash drives.

Symposium on Criminal Justice Reform. RT&E Center staff attended a two-day symposium on Technology in Criminal Justice Reform at the University of Pennsylvania School of Law in Philadelphia in May 2016. Notable sessions included Risk Assessment Tools, Predictive Policing, Video in Criminal Justice and Data as Evidence. Staff made useful contacts for ongoing RT&E Center projects.



June

Inter-Agency Board Meeting. The JTIC materials scientist and standards coordinator attended the Inter-Agency Board meeting in Columbus, Ohio, from June 6-9, 2016. The IAB meets three times a year to establish priorities for standards development for the law enforcement and firefighter communities. Staff attended to discuss the female body armor initiative, ballistic shields and coordinating with the board to establish new priorities.

Florida Association of School Administrators Conference. The JTIC school safety subject-matter expert exhibited at the Florida Association of School Administrators Conference June 13-15, 2016, in Orlando, Fla. Attendees expressed interest in the School Safe app. The SME distributed 445 items.

DHS S&T First Responder Technology Hill Demo Day. The outreach coordinator attended the DHS S&T First Responder Technology Hill Demo Day at the Rayburn House Office Building in Washington, D.C., on June 15, 2016. Staff met with members of Congress, as well as DHS S&T staff and project researchers regarding new and emerging technologies for first responders.

National Sheriffs Association Summer Conference. JTIC staff exhibited at the NSA Summer Conference June 26-28, 2016, in Minneapolis; the new JTIC-branded exhibit booth made its debut. Attendees were particularly interested in the affordability of gyroplanes and aviation assets. Staff promoted the School Safe app and Field Search, and distributed 138 items.

Police Security Expo. JTIC staff exhibited at the Police Security Expo in Atlantic City, N.J., June 27-29, 2016. Attendees expressed interest in what JTIC does and how it interacts with the law enforcement community. Staff provided information on the CTP and on the School Safe app. The majority of visitors took a JTIC “credit card” USB drive, and staff distributed 226 items.

Human Factors in Forensic Science Practice Sourcebook Working Group. The FTCoE hosted the first Human Factors in Forensic Science Practice Sourcebook working group meeting from June 29-July 1, 2016, on the RTI International campus in North Carolina. During this meeting, 19 forensic scientists, cognitive psychologists and guests from NIJ and NIST met to discuss how current research in cognitive psychology may be instructive in addressing some of the challenges faced in today’s forensic science laboratory. Several presentations on forensic science disciplines were given to introduce the cognitive psychologists (several of



whom were unfamiliar with the forensic field) to the way forensic analyses are performed and to the human factors that are faced. All of the psychologists gave a presentation on their research area of expertise (areas such as learning, reasoning, personnel selection and more) and how they felt their knowledge could be applicable to forensic science issues. The meeting ended with the formation of task groups to develop chapters of the sourcebook, which will be divided along cognitive psychology topic areas that will be broadly applicable to multiple forensic science disciplines. The working group plans to hold periodic virtual meetings to facilitate the progress of the sourcebook, as well as additional in-person meetings. The cognitive psychologists are also making plans to visit various forensic laboratories to gain more insight into the unique challenges they face.

July

North Carolina Association of School Resource Officers. The JTIC school safety subject-matter expert exhibited at the NCASRO Conference July 10-15, 2016, in Sunset Beach, N.C., promoting the School Safe app, *Sharing Ideas and Resources to Keep Our Nation's Schools Safe!* Vol. 4, the SchoolSafetyInfo.org website and the NIJ school safety program. He distributed 252 items from the NLECTC inventory.

National Association of School Resource Officers Conference. JTIC staff exhibited at the NASRO Conference July 11-12, 2016, in Anaheim, Calif. Staff identified school safety decision makers from school districts and from police departments and asked them how they get their technology information, suggesting that they subscribe to *JUSTNETNews* and *TechBeat*. Several attendees asked for access to the School Safe app, and many participants indicated familiarity with JTIC services. In addition to the app, *Sharing Ideas and Resources Vol. 4* also proved popular with attendees. Staff distributed 263 items from NLECTC inventory.

Airborne Law Enforcement Association Annual Conference. JTIC staff exhibited at the annual ALEA conference July 20-22, 2016, in Savannah, Ga. Participants generally knew about the Compliance Testing Program; some also indicated awareness of other JTIC services. NIJ Senior Law Enforcement Program Manager Mike O'Shea gave a presentation on unmanned aircraft systems at the conference and also participated on a panel regarding UAS technology. After his panel presentation, attendees came by the JTIC booth to pick up NLECTC and Federal Aviation Administration UAS publications mentioned during the presentation; a total of 88 items were distributed during the event. Although there was not a lot of booth traffic as



most attendees were there specifically for aircraft technologies and information/products, the conference was worthwhile due to interest in the NIJ UAS program.

School Safety Advocacy Council Annual School Safety Summit. JTIC staff exhibited at the SSAC Annual School Safety Summit July 25-27, 2016, in Orlando, Fla. Staff identified school safety decision makers from both school districts and police departments and asked how they get their technology information. Suggestions to participants included subscriptions to *JUSTNETNews* and *TechBeat*. Many indicated familiarity with JTIC services in general and with the CTP in particular. *Sharing Ideas and Resources To Keep Our Nation's Schools Safe! Vol. 4* proved popular with attendees. Two school resource officers from the Frederick County (Md.) Sheriff's Office assisted in the booth, and heavily promoted the School Safe app, resulting in numerous follow-up requests for it. NIJ Senior Law Enforcement Program Manager Mike O'Shea also assisted in the booth. Staff distributed 236 items from the NLECTC inventory and 135 from other sources.

August

National Association of Women Law Enforcement Executives. JTIC staff exhibited at the 21st annual NAWLEE Conference in Indianapolis on Aug. 1-4, 2016. An overwhelming majority of the attendees visited the JTIC booth and indicated familiarity with the CTP. Numerous female officers shared that their armor is uncomfortable and does not fit a woman's frame well; they responded positively to learning that research in the area of testing female body armor is ongoing. Staff distributed 31 items.

American Correctional Association Congress of Correction. The JTIC corrections subject-matter expert delivered a workshop presentation titled: "UAS: The Latest Threat in a Never Ending Battle" at the ACA 2016 Congress of Correction Conference in Boston on Aug. 7-9, 2016. Staff also exhibited at the event, interacting with technology vendors and conference attendees, and distributed 146 items from the NLECTC inventory and 18 non-NLECTC items.

Maryland Association of School Resource Officers Annual Conference. JTIC staff exhibited at the MASRO Annual Conference in Annapolis, Md., on Aug. 8, 2016, interacting with conference attendees and promoting JTIC's School Safe app, the SchoolSafetyInfo.org website and various JTIC school safety publications. Staff distributed 305 items from the NLECTC inventory.



Midwest Security/Police Expo and Conference. JTIC staff exhibited and interacted with conference attendees at the Midwest Security/Police Expo and Conference on Aug. 15-17, 2016, in Tinley Park, Ill., discussing their familiarity with JUSTNET, the CTP and various NIJ and JTIC programs. Special emphasis was placed on having attendees sign up for Field Search as a school safety resource due to the increase in schools issuing laptops and tablets to students. The software can be used to check if students are visiting inappropriate websites. Staff distributed 158 items from the NLECTC inventory and 51 non-NLECTC items.

National Native American Law Enforcement Conference. JTIC provided approximately 130 NLECTC and 40 non-NLECTC items in support of an unstaffed National Criminal Justice Reference Service exhibit at the National Native American Law Enforcement Association Collaborative Training Event Aug. 23-25, 2016, in Las Vegas.

American Probation and Parole Association Summer Conference. The JTIC corrections subject-matter expert delivered two workshop presentations: “The Internet of Things for Probation and Parole” and “Offender Tracking: It’s All About to Change” at the APPA conference in Cleveland, Ohio, on Aug. 28-30, 2016. He also chaired the APPA Technology Committee. Staff exhibited at the event, interacting with technology vendors and conference attendees. The JTIC corrections subject matter expert’s presentation drove traffic to the booth, which helped with publications distribution. There was a great deal of interest in Field Search, which was heavily promoted due to its recent upgrade. Staff distributed 111 items from the NLECTC inventory and 11 non-NLECTC items.

September

National Sexual Assault Policy Symposium. The FTCoe hosted “Looking Ahead: The National Sexual Assault Policy Symposium” on Sept. 8-9, 2016, in Washington, D.C. The symposium focused on how the nation is moving forward and finding solutions to the complex issues that arise in sexual assault cases and in testing sexual assault evidence. This unprecedented event, which featured an array of stakeholders including medical staff, law enforcement, crime laboratories, victims’ advocates and prosecution, highlighted current accomplishments and shared valuable experiences from jurisdictions throughout the country. The event supports the nation’s policymakers and practitioners as they drive future efforts to solve sexual assault cases, provide justice to victims and ultimately improve public health and public safety. All of the panel presentations have been archived and can be found on the



FTCoE website. In addition, a video presentation highlighted participation from NIJ, speakers and attendees. The NIJ and FTCoE websites will showcase this video in the coming months.

Urban Shield Training Event. On Sept. 8-13, 2016, the JTIC standards coordinator attended the Alameda County (Calif.) Sheriff Office’s “Urban Shield” training event along with NIJ Senior Law Enforcement Program Manager Mike O’Shea and a member of the Somerset (Ky.) Police Department. This four-day event was based around training and preparation for critical incidents such as natural disasters, industrial accidents and chemical spills, riots, terrorist attacks and traffic accidents. The exercise included the use of UAS in various scenarios, and the NIJ team gained insight into how UAS can benefit officers on the ground. De-brief sessions highlighted both positive aspects of having UAS support and the limitations and challenges faced from both legislative and public perception.

Maryland Chiefs of Police and Sheriffs Association Annual Training Seminar. JTIC staff exhibited at the Maryland Chiefs of Police and Sheriffs Association Annual Training Seminar on September 11-12, 2016, in Ocean City. Staff distributed 57 items that included both NLECTC inventory and non-NLECTC items.

Virginia Association of Chiefs of Police. JTIC staff exhibited at the VACP Annual Conference in Roanoke from Sept. 18-19, 2016, interacting with conference attendees and discussing their familiarity with JUSTNET, the CTP, and various NIJ and JTIC programs. Special emphasis was placed on making attendees aware of Field Search as a school safety resource due to the increase in schools issuing laptops and tablets to students. The software can be used to check if students are visiting inappropriate websites. Staff distributed 49 items, including both NLECTC inventory and non-NLECTC items.

Personal Armor Systems Symposium. On Sept. 18-23, 2016, the JTIC materials scientist and the standards coordinator traveled to the Personal Armor Systems Symposium in Amsterdam, the Netherlands, for a five-day technical conference hosted by the International Personal Armor Committee and attended by representatives from the government, military, manufacturing and associated professions. The 380 participants came from countries including the United Kingdom, Germany, the Netherlands, France, Belgium, New Zealand, Australia, India, Spain, Italy and the United Arab Emirates. Discussion topics included standards and testing, armor materials, blast injury and mitigation, human vulnerability, behind armor trauma, threats, casualty reduction and operational analysis. As part of the Human Factors Session,



the standards coordinator filled in, due the researcher's family emergency, and presented NIJ-sponsored work on the effect of wearing body armor on the core body temperature of officers during normal duties. The presentation in the primary conference hall was attended by more than 300 people and lasted approximately 40 minutes, and included a question-and-answer session. Feedback from the hosts and participants was very positive.

Massively Parallel Sequencing Simulation Tool. At the International Symposium on Human Identification in Minneapolis, Minn., on Sept. 26, 2016, the FTCoE presented at a workshop that provided attendees with a unique opportunity to learn best practices to implement massively parallel sequencing into a typical forensic laboratory workflow. Supported by the FTCoE, the University of North Texas Health Science Center and the North Carolina State University, the workshop showcased an immersive and interactive virtual simulation tool that guides DNA practitioners through three commercially available forensic laboratory processes amenable to two MPS instruments. Attendees received the opportunity to virtually employ laboratory protocols as well as analyze forensically relevant genetic loci through commercially available and third-party software applications. The simulation tool can be experienced on the FTCoE website.

2006-DN-BX-K016: Synthesis and Analytical Profiles for Regioisomeric and Isobaric Amines Related to MDMA, MDEA and MBDB: Differentiation of Drug and non-Drug Substances of Mass Spectral Equivalence. The FTCoE assisted with a half-day workshop, given by the Southern Association of Forensic Scientists on Sept. 26, 2016, as a peer-reviewed and accepted workshop that was part of the SAFS annual meeting. Sixteen individuals attended the workshop and provided positive feedback. The FTCoE is considering repeating this workshop, independent of SAFS, in hope of reaching a wider audience. In addition, based on SAFS attendee feedback, the FTCoE plans to offer an online event for a GCIR technology update.

October

Metropolitan Washington Council of Governments Technology Committee Meeting. On Oct. 4, 2016, the JTIC director, NIJ Grants and Policy Division Director Dr. Mark Greene and Senior Law Enforcement Program Manager Mike O'Shea and representatives from the Metropolitan Washington Council of Governments Police Chiefs Technology Committee met at



Montgomery County Police Headquarters in Rockville, Md. As a result of this discussion, NIJ and JTIC will support a future COG meeting to bring together representatives from leading law enforcement agencies nationwide to discuss national standards for civil disturbance protective equipment for law enforcement officers and chart a path forward.

Maryland Transportation Authority Vehicle Accident Scene Photography and Mapping Meeting. On Oct. 5, 2016, the standards coordinator and NIJ Senior Law Enforcement Program Mike O'Shea met with Maryland Transportation Authority Police in Bay Bridge to discuss assistance for MDTA's project to become a "go-to resource" for U.S. law enforcement agencies wishing to use unmanned aircraft systems for vehicle accident scene photography and mapping (for more details, see "Increasing Understanding of an Evolving Technology," p. 51.) This includes their procurement of UAS aircraft, obtaining FAA flight approval, assistance with developing a curriculum with the FAA and MDTA for pilot ground school requirements, and investigating options for online video-based training.

U.S. Department of Homeland Security EMERGE 2016 First Responder Engagement Event. JTIC staff attended the DHS EMERGE 2016 First Responder Engagement Event in Herndon, Va., on Oct. 11, 2016. The event showcased emerging body-worn technologies and sought first responder input in an effort to help close those two capability gaps.

International Association of Chiefs of Police Annual Conference. JTIC staff exhibited at the IACP Annual Conference in San Diego, Calif., on Oct. 15-19, 2016. Staff, including CTP personnel, met with agency decisionmakers and body armor manufacturers. Staff heavily promoted the new Safeguarding Houses of Worship app to attendees, and also promoted the partnership among the U.S. Department of State, the Bureau of Counterterrorism, the National Institute of Justice and the Kenyan Wildlife Service, with a gyroplane and four pilots from the KWS in attendance. Three pilots from the Tomball, Texas, and Somerset, Ky., police departments attended to answer questions about gyroplanes and NIJ's low-cost aviation program. Staff from the FAA also promoted the use of unmanned aircraft systems for law enforcement.

Staff asked attendees about their technology needs, as well as their familiarity with the NLECTC and JTIC programs. They collected cards from conference attendees for followup on specific technology needs and issues that could be addressed by JTIC staff.



CTP staff met with various body armor manufacturers to promote the NIJ Mark initiative (see “Registered National Institute of Justice Mark Indicates Compliance With Program Standards,” p. 19.) and the January 2017 Body Armor Manufacturers Webinar. Staff gave small signs to manufacturers who have already enrolled to place in their booths to promote the program. The JTIC aviation subject-matter expert also participated on the aviation subcommittee.

Staff distributed 1,200 items from the NLECTC inventory and other sources.

RT&E Center staff also attended the event. Sessions of particular interest included Situational Awareness in Real-Time Crime Centers, Recent Results on Body Worn Camera Evaluation, Evidence-Based Policing at the Agency Level, Preparing for NIBRS and Police Officer Recruiting. Staff took advantage of many opportunities to discuss vendors’ technologies and gain insight into the state of practice and emerging capabilities.

National Fusion Center Training Event. RT&E Center staff participated in the National Fusion Center Training Event in Alexandria, Va., on Oct. 25-27, 2016, and gained knowledge and contacts among the fusion center community and vendors. Crime analytics and case management systems seemed to predominate the discussion. Featured speakers included Director of National Intelligence James Clapper and FBI Director James Comey.

Statistics and Applied Mathematics in Forensic Science Decision Making and Reporting Workshop. On Oct. 31-Nov. 2, 2016, the FTC&E hosted 48 forensic scientists for a three-day technology transition workshop focused on Statistics and Applied Mathematics in Forensic Science at the RTI International offices in Washington, D.C. The workshop’s goal was to refresh, review and complete basic notions of statistics and probability theory that apply to a wide range of forensic disciplines and evidence types. Fundamental statistical concepts, such as confidence intervals, hypothesis testing, sampling theory, logical inference and their applications to forensic problems, such as sampling among large drug seizures, calculating confidence interval in forensic chemistry and toxicology and interpreting the probative value of pattern evidence were presented, discussed and practiced in class. Examples and datasets were also provided for the practical exercises. Examples focused on trace and pattern evidence, as well as forensic drug analysis and toxicology. For more information about this workshop or to download the workshop materials, visit the website at https://www.forensiccoe.org/stats_workshop_fall_2016.



November

Advanced Radiologic Imaging in Medicolegal Death Investigation Workshop. In conjunction with the University of New Mexico, the FTCoE hosted a technology transition workshop focusing on advanced radiologic imaging for medicolegal death investigation on Nov. 11-13, 2016. The workshop took place at the New Mexico Office of the Medical Investigator/Radiology-Pathology Center for Forensic Imaging (CFI) and a computer laboratory at the University of New Mexico Health Science Center, School of Medicine. The goal of the workshop was to enable and enhance the effective transfer of advanced imaging technology into forensic practice in the United States. This goal was accomplished by introducing attendees to the history and current status of radiology and advanced imaging in forensics, basic concepts in the production of CT and MR images, CT and MR protocols, image viewing software, 3D rendering and interpretation/reporting of advanced imaging. Major imaging findings in common types of death were introduced and salient imaging case examples of each was provided in each section of the course. The targeted audience was forensic pathology decision makers including chief and assistant chief medical examiners/coroners, leaders of the National Association of Medical Examiners and members of the College of American Pathologists Technology Assessment Committee.

Metropolitan Washington Council of Governments Body-Worn Camera Working Group Meeting. The outreach coordinator attended the Metropolitan Washington Council of Governments Body-Worn Camera Working Group meeting in Washington, D.C. on Nov. 17, 2016. He provided body-worn camera subject-matter expertise to several metropolitan Washington area law enforcement agencies that are testing, or that are about to implement, body-worn camera programs.

District of Columbia Presidential Inaugural Committee Communications Subcommittee Meeting. The JTIC outreach coordinator attended an open house at the Washington, D.C., Homeland Security and Emergency Management Agency Emergency Operations Center on Nov. 17, 2016. The open house was a precursor to a tabletop exercise on the Presidential Inauguration scheduled for December 6. He had worked on the 2012 Presidential Inauguration with the U.S. Secret Service's communications staff and was asked to join the District of Columbia Presidential Inaugural Committee Communications Subcommittee due to communications and inaugural communications expertise.



December

District of Columbia Presidential Inauguration Committee Communications

Subcommittee Tabletop Exercise. The JTIC outreach coordinator participated in the District of Columbia Presidential Inauguration Committee Communications Subcommittee Interoperable Tabletop Exercise in Washington, D.C., on Dec. 6, 2016. The JTIC staff member was invited to participate due to his participation in previous Presidential Inaugurations, including having worked with the U.S. Secret Service's Communications Division.

Metropolitan Washington Council of Governments Meeting. On Dec. 22, 2016, JTIC staff presented to the Metropolitan Washington COG Police Chiefs Committee monthly meeting on the SchoolSafe and Safeguarding Houses of Worship apps, as well as on the Field Search software. This was the result of a COG request due to schools and houses of worship being identified as new soft targets for terrorist attacks.



UNMANNED AIRCRAFT SYSTEMS

Increasing Understanding of an Evolving Technology

UASs are used at times by law enforcement agencies as cost-effective, efficient and potentially life-saving tools to support public safety efforts. However, there is much confusion in the field about when and how these craft prove most useful to law enforcement. Agencies also need assistance navigating the Federal Aviation Administration (FAA) requirements regarding use of UAS. In 2016, the Justice Technology Information Center, at the direction of NIJ, expanded its efforts to provide information to law enforcement agencies regarding this evolving technology.

Highlighting and Encouraging Model Programs

Since the introduction of FAA registration for unmanned aircraft systems in early 2015, more than 600,000 UASs have been registered with the agency. That's almost double the 370,000 "traditional" aircraft that have current FAA registration.



“From an engineering perspective, it’s a technology that is growing at an astronomical rate. As the technology advances, the devices get better, cheaper and more accessible. Right now, you can purchase a system that will take extremely high-resolution photos for much less than \$1,000,” says JTIC Standards Coordinator Dan Longhurst. “UAS can be a tremendous asset to law enforcement, but unfettered use by private citizens can also be a hazard.”

To help law enforcement learn to cope with the hazards and capitalize on the potential, NIJ has given Longhurst and JTIC a directive to work with some of the agencies that have pioneered the use of UAS in law enforcement, to help enable the Center to assist agencies by sharing lessons learned and best practices.

Alameda County, Calif. The Alameda County Sheriff’s Office is willing to share policies, procedures, training information and general knowledge with other agencies: “We’re using and showcasing Alameda as an exemplar of good use of UAS. They’ve gone through all the right processes with the FAA and they let their operational needs drive the technology choice rather than thinking ‘let’s buy a UAS and then figure out what to use it for.’”

The program began operation during 2015, and has a trained helicopter pilot as chief pilot. The sheriff’s office uses the system for missions as varied as search and rescue, accident scene mapping, fire scene management, tactical incident situational awareness and helping locate cars that have gone over cliffs. The agency’s jurisdiction contains a wide variety of geographic areas ranging from dense urban centers with sophisticated infrastructure to remote mountains and small towns. NIJ is providing no assistance to this program; Alameda County shares information willingly out of professional courtesy.

Maryland Transportation Authority. On the other side of the country, NIJ is providing assistance to the Maryland Transportation Authority with a goal of establishing a training center that can serve as a national resource.

“They have a good use plan and their environment includes roads, tunnels and bridges. They’re looking at using UAS to map crash scenes and help clear the roads more quickly, and also as a tool for checking infrastructure like bridges,” Longhurst says. NIJ, the state of Maryland and the Transportation Authority are working together to develop a ground school for pilots that will



allow officers from any law enforcement agency in the country to train to get their UAS pilot's license. In order to fly a UAS for law enforcement purposes, it's best practice for officers to learn about awareness of surrounding air space, how to read a navigation chart, and some of the ins and outs of aviation law.

"According to FAA classifications a UAS can weigh anywhere from .55 pounds to 55 pounds, and some of them go as fast as 100 mph," says Longhurst. "When you think about something that weighs 55 pounds moving at 100 mph, there's potential for problems if you don't know what you're doing. One of the goals of this initiative is to help law enforcement agencies learn what they should do, and what regulations apply to citizens who lack that knowledge."

"Eyes in the Sky" Takes Flight on YouTube

On May 2, JTIC posted "Eyes in the Sky: How Law Enforcement Uses Unmanned Aircraft Systems" to JUSTNET's YouTube channel. The video, produced by JTIC staff on behalf of NIJ, was mainly shot on location in Grand Junction, Colo., and featured the Mesa County Sheriff's Office UAS program. Mesa County has been flying UASs for nearly seven years, and program manager Ben Miller walked JTIC staff through the ins and outs of his program, highlighting what the technology can and cannot do. He explained that his agency primarily uses UASs to assist with traffic accident investigations, aid with searching for missing persons and help with monitoring other emergency scenes such as fire and rescue operations. According to Miller, it is important to know the technological capabilities of the aircraft before purchasing and to properly train law enforcement personnel on the use of it. It's also essential to gauge the community's level of understanding of the agency's use of UASs before standing up a program, and he recommends holding public forums to educate residents and to allay fears before implementing a new program.

The video also features Dave Morton, former FAA UAS Integration Office National Law Enforcement Program Manager and current JTIC aviation subject-matter expert, who takes law enforcement agencies through the steps for FAA approval of a UAS program and shows them where to find online applications and instructions. According to Morton, the FAA is eager to work with law enforcement agencies and continues to streamline the process to get them flying UASs as quickly and efficiently as possible.



The International Association of Chiefs of Police (IACP), the Association for Law Enforcement Aviation (ALEA) and the Law Enforcement/Emergency Services Video Association assisted JTIC with the planning and production of the video, which has been well-received by JUSTNET's users. It has consistently been the most-watched video on the YouTube channel for the last eight months of 2016 with 2,192 views. It can be seen at https://www.youtube.com/watch?v=2gzeXn_OoqI

For additional information on JTIC's efforts in the area of aviation technology, contact Mike O'Shea, NIJ senior law enforcement program manager, at michael.oshea@usdoj.gov.



JUSTICE INNOVATION CENTER

Identifying, Evaluating and Disseminating Information Where the Need Is Acute

Technology makes significant contributions to the effectiveness, efficiency and safety of the criminal justice system. Work to develop new technologies — and to find new ways of using existing technologies — can improve the efforts of law enforcement, courts and corrections agencies in many ways. However, the development and application of technology in these sectors can be challenging. For a variety of reasons, this challenge is felt most acutely in small, rural, tribal and border (SRTB) areas.

The NLECTC System includes a center to help agencies in SRTB areas identify and implement technology to improve their functioning: the Justice Innovation Center for Small, Rural, Tribal, and Border Agencies (JIC). The JIC mission is to identify, evaluate and disseminate information on technology solutions that meet the operational challenges of SRTB communities.



To accomplish its goals, JIC has gathered information on the challenges facing SRTB agencies, identified technology solutions that may address those challenges and begun evaluating those technology solutions in real-world situations. These activities will provide actionable guidance to SRTB agencies for prioritizing, planning and implementing technology.

Identifying the Needs and Challenges of Criminal Justice Agencies in Small, Rural, Tribal, and Border Areas – JIC’s In-depth Report

In 2016, JIC published a report that focused on identifying the specific challenges faced by SRTB criminal justice agencies (http://www.rand.org/pubs/research_reports/RR1479.html). It drew on three main sources: a review of published literature, a set of nearly 150 interviews with practitioners and information from an advisory panel meeting that JIC convened in December 2015. The report found that all types of criminal justice agencies deal with challenges in information technology (IT), agency operations, geography, and funding and resourcing. In addition:

- In IT, the most common challenges are in interoperability and infrastructure. Other issues include difficulties adopting new technologies, wide dislike of available jail-management systems, lack of qualified vendors and IT support serving rural areas, and challenges providing remote data access.
- Each agency type has unique concerns related to agency operations: Law enforcement agencies find it difficult to support specialized positions and assignments, recruit and retain qualified personnel, and manage positive relationships with the communities they serve. Courts need help applying innovative tools to case processing and also need to improve access to justice. Institutional corrections agencies are challenged to provide sufficient quality mental health and substance-use treatment training and have difficulty with staffing and turnover. Community corrections agencies see the biggest challenges in managing electronic files, conducting supervised substance-use testing, and effectively managing offices with limited personnel.
- All types of agencies report geographical challenges, including a lack of key local resources and the effects that long distances have on such things as response and travel times, the ability to adequately supervise dispersed populations, the cost of transportation and staff productivity lost because of transportation time.



- Resource challenges range from limited technology funding, difficulty in applying for federal funding, and limited budgets and revenues to lack of new or upgraded equipment, understaffing, difficulty keeping up with facility maintenance and upgrades, and adequately providing health and other services to those who come into contact with the criminal justice system.

Based on its research, JIC made four recommendations:

- Law enforcement agencies should identify strategies to improve relationships with their communities, including improving transparency and public relations. They also need to improve data- and information-sharing with other agencies and jurisdictions; leverage common standards for data management and other IT resources; and address problems with IT management.
- Courts should address the surge in pro se litigants by exploring streamlined administrative processes and remote filing options for these litigants, improve security and resilience, and improve IT infrastructure — especially regarding the compatibility of systems with those of other agencies in the jurisdiction.
- Institutional corrections agencies should improve mental health service provision and the availability of other services for inmates, and provide professional development for corrections personnel. They also need to improve jail management systems and information-sharing, and prepare for funding shortfalls.
- Community corrections agencies should refocus on rehabilitation and positive behavioral change. They need to improve information-sharing, manage resources across geographically dispersed agencies and personnel, and prepare for funding shortfalls.

All agencies should improve information-sharing between other agency and other governmental systems, work cooperatively to procure and manage IT systems, explore the use of videoconferencing to overcome distance barriers, seek help applying for various grants and use nonstandard personnel to address staffing shortfalls when appropriate.



Tech Highlights: Spotlighting Innovative Technologies in the Real World

JIC has identified a number of agencies implementing innovative technologies that were willing to share their stories. JIC continues to develop these stories and by late 2016, eight such Tech Highlights had been published online.

These short technology reviews demonstrate how SRTB agencies are making technologies work for them:

- **Case Management System on the Tulalip Reservation, Wash.** Case management systems (CMSs), which are software systems that help courts manage case information from filing to post-adjudication, are instrumental in enabling courts to adopt e-filing and go paperless. Using a CMS provides various law and justice personnel with the ability to access and share information about all parts of a case throughout the entire process, both remotely and simultaneously. In addition to helping manage case processing and enabling information sharing, these systems handle data privacy and access issues. They range in complexity and price.
- **Case Management System (CMS) in Community Corrections in Minnesota.** Probation officers are a mobile workforce that needs secure access to parolee data in the field. In 2014, Cass County Probation began implementing mobile access to client data in its Court Services Tracking System using smartphones and tablets. As long as they have Internet access, probation officers can use the system as if they were sitting in their office at a desktop computer. Instead of preparing hard copies of data before going into the field, probation officers have more time to engage with their clients.
- **Portable Breath Testers in Whatcom County, Wash.** Probation clients who abuse alcohol may be assigned to frequent alcohol testing as part of their probation conditions. Whatcom County Probation adopted portable breath testers (PBTs) to screen clients before they leave the probation office to prevent driving under the influence. Having the PBTs onsite allows the probation office to administer its own testing instead of relying on law enforcement for assistance. A client who tests positive can leave the probation office when his/her blood alcohol content is below 0.02 percent or if someone else drives.
- **Mandatory E-filing at Courts in Minnesota.** Traveling to a courthouse to submit and review documents can take considerable time, particularly in rural areas. E-filing enables



legal service providers and the public to file legal documents electronically without traveling to the courthouse. In the Ninth Judicial District of Minnesota, e-filing, integrated with an existing case management system, has increased accessibility by those in remote areas and helped lighten staff workloads.

- **Telepsychiatry for Jail Inmates in Carlton County, Minn.** In small, rural counties, healthcare specialists are both in short supply and challenged to meet the needs of inmates who suffer from substance abuse and mental health problems. In 2014, the Carlton County Jail entered into contract with a private, nonprofit organization to provide telepsychiatry services to inmates for 1.5 hours every two weeks. Since telepsychiatry has been implemented, jail administrators have observed that inmates require fewer trips to the emergency room and mental health service provision costs have been reduced.
- **North Carolina's Remote Probation Monitoring Through the Offender Accountability Reporting Program.** Despite the number of adults on probation, cuts to state and federal probation budgets have forced departments to find creative solutions to effectively monitor their growing caseloads. North Carolina adapted an existing scale to categorize probationers by their level of risk, then developed a web-based probation monitoring tool for use with low-risk offenders. This change allows probation offices to more efficiently use their limited resources. Officers assigned to lower-risk cases can carry caseloads roughly 60-100 percent larger than those supervising higher-risk probationers.
- **Information Sharing via SharePoint: Experience From the Salt River Pima-Maricopa Indian Community.** This 118-member police force, which covers 88 square miles, needed a way to coordinate information sharing. It adopted Microsoft's SharePoint system, which works in conjunction with agency-provided smart phones. Officers and detectives can now efficiently access information in one centralized place, which facilitates access to everything from standard reporting forms to gang intelligence to training schedules.
- **Providing Court Services to Geographically Remote County Constituents: The Mohave County Experience With a Video Kiosk.** Mohave County spans the Grand Canyon, making for a long drive for residents of the North Rim to reach the county courthouse located on the South Rim. Instead of constructing an expensive new courthouse, the county installed a video kiosk in an existing DMV building on the North Rim. The kiosk functions as part of an existing videoconference system, meaning no



training was needed for employees to use the system. The video kiosk allows North Rim residents to make a court “appearance” for charges that don’t involve mandatory jail time, reducing the burden of travel time to court on those residents.

Field Studies: Evaluating What Works

Finally, in 2016, JIC began work on a number of field studies in which JIC researchers work with SRTB agencies to conduct evaluations of how well technologies are working and what results they have achieved. As of the end of 2016 these are all still in progress and include:

- **Time Use Study.** JIC researchers have visited seven SRTB criminal justice agencies to better understand how staff members in these agencies spend their time. The project is working to build a data collection tool that allows staff to report their various daily activities, and the data collected will be used to investigate whether certain types of tasks would benefit from the implementation of technology to improve efficiency.
- **Civil Litigation Services in New Mexico.** JIC is working with the non-profit New Mexico Legal Aid society to evaluate use of a screening tool that allows better matching of requests for legal assistance from low-income clients with available services around the state. This tool should reduce time spent on intake and increase time spent providing representation, as well as minimize duplicate case intake among various service providers. Based on a client survey and other administrative data, JIC will evaluate the impact of this online triage system on the efficiency and effectiveness of the services received, as well as overall system efficiency and effectiveness.
- **Remote Supervision of Low-Level Probationers in North Carolina.** The state of North Carolina developed a risk assessment tool to assess the recidivism risk of all new probationers. Based on these scores, the state implemented a web-based probation monitoring tool for low-risk offenders to more efficiently use their limited resources. JIC researchers are evaluating whether probationers continue to receive an appropriate level of supervision, even though some are supervised by officers with larger caseloads but less-risky probationers.



- **Remote Arraignment in New Jersey.** In some courts in New Jersey, persons being arraigned can choose to appear via video monitor rather than traveling to the courthouse in person. But there is some evidence from prior work that bail decisions for those appearing remotely might be different from decisions made for those appearing in person. JIC researchers will evaluate the impact of remote appearances during arraignment using quasi-experimental methods. They will analyze observational data from arraignment proceedings to determine if defendants who appear over video receive bail decisions similar to those made for individuals who appear in person.

- **Remote Alcohol Monitoring in Yellowstone County Community Corrections.** The Montana Highway Patrol has begun using handheld alcohol monitoring devices to monitor alcohol use by individuals arrested for intoxicated driving. The handheld devices are carried by participants (e.g. SoberLink or Remote Breath) so that they can conduct alcohol tests themselves remotely. Arrestees can also opt to use the traditional in-person portable breath tester at the Yellowstone County Sheriff’s Department. JIC’s study will work with the sheriff’s department to examine these remote alcohol monitoring technologies by tracking implementation of the new devices and examining the strengths and challenges of each type of technology. The work will also incorporate data collection techniques developed as part of JIC’s time use study to analyze how the new devices change time spent on alcohol use testing, and will incorporate expense analyses.

- **Tablets in Jails.** JIC researchers are in the early stages of working with a private firm, Edovo, that supplies tablet computers to correctional facilities for training purposes. JIC researchers will work with one to three SRTB jail facilities that have started implementation of the Edovo tablets. JIC will evaluate details of how Edovo is implemented and assess the tablets’ direct impacts on users. The effort will also evaluate different features of Edovo to understand if and why such features do or do not affect different outcomes for inmates and correctional officers.

For additional information on the Justice Innovation Center, contact Mike O’Shea, NIJ senior law enforcement program manager, at michael.oshea@usdoj.gov.



CRIMINAL JUSTICE PRIORITY TECHNOLOGY NEEDS INITIATIVE

Focus on School Safety, Courts and the Justice System

The Criminal Justice Priority Technology Needs Initiative is a partnership between the RAND Corporation, the Police Executive Research Forum, the University of Denver and RTI International to identify technology needs for the criminal justice community on behalf of NIJ. The intent of the partnership is the identification and discussion of the needs and priorities of the criminal justice community in order to foster greater innovation and foresight on issues surrounding introduction or integration of new, transformational technology within the system.

More details are included below on reports that have been released during 2016, as well as an additional report on implications of technological changes on the protection of constitutional rights and due process.

The Role of Technology in Improving K-12 School Safety

Although high-profile incidents of school violence such as mass shootings usually dominate public attention, schools face many



challenges from more commonplace incidents of violence, such as bullying or assault, that occur on a more regular basis. This report uses reviews of relevant literature, case studies and surveys of expert opinion gathered from expert panelists in a workshop to examine several factors related to the use of technology in improving school safety. Factors examined include incidence rate of school violence, types of violence and the types, uses, effectiveness and limits of technology intended to mitigate it.

Key findings include:

- *School violence incidence rate.* Serious and fatal violent incidents at schools are both devastating and rare. Nevertheless, most schools experience some amount of violence of a lesser severity, although rates have declined since the 1990s. Evidence suggests the rate of school violence is strongly associated with school climate and is most likely to occur in places with the least adult supervision, but rates of violence differ across student subgroups, behavior and activities.
- *Technology.* Twelve categories of school safety technologies were identified, although data on their prevalence and effectiveness are scarce. Expert opinion was gathered on perceived appropriateness and barriers to adoption to new technology for urban, suburban and rural locales. Six technologies deemed very appropriate for enhancing school safety were used in case studies examining the use of innovative technology in practice.
- *Prioritizing Technology and Needs.* Groups of experts ranked the priority of technological needs for addressing the most severe and the most probable forms of school violence.

Recommendations were crafted for three different communities: research and evaluation, technology developers and schools.

Recommendations for research and evaluation focused specifically on the dearth of sound research and evidence on which technologies work in improving school safety, how they work and how effective they are. As such, the report recommended those working on research and evaluation establish a sound evidence base, rigorous research designs and effective metrics for assessment of outcomes from use of the new technology.

For technology developers, recommendations focused on developing beneficial improvements to technologies that affect various means of better communication, information sharing and



media monitoring. Furthermore, the report recommends a greater emphasis on real-world testing of these technologies.

Finally, multiple recommendations were directed at schools. The report stressed the importance of schools installing necessary prerequisites for effective use of new technology, such as comprehensive safety plans and possible synergistic changes to aspects of the school culture. Further, schools must assess the ease of integration and future upgrade of new technologies, and identify the school's needs, budget and values before assessing whether a potential new technology fits.

Fostering Innovation in the U.S. Court System: Identifying High-Priority Technology and Other Needs for Improving Court Operations and Outcomes

The Initiative organized an expert advisory panel comprised of experts and practitioners from within the courts system, including judges, attorneys and administrators. Using a structured brainstorming session, the panel was tasked with crafting an innovation agenda that would identify changes in technology, policy and practice needed to meet challenges faced by those in the court system. These needs spanned a broad range of changes, including incorporation of new technologies, actions from researchers and government actions or public advocacy. Overall, the panel identified more than 130 needs and ranked them by scoring according to value to the court system, feasibility and broad adoption.

The majority of the needs were broadly classified as pertaining to information and communication or doctrine and knowledge, with a smaller subset pertaining to changes to facilities. Several key themes were identified from those needs that were rated highly enough to be included on the agenda.

Themes included:

- Using technology to improve court efficiency.
- Improving security and emergency preparedness.

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- Improving quality and utilization of shared data.
 - Strengthening analysis and use of data.
 - Court record management and protection.
 - Addressing basic technology shortfalls.
 - Improving the technology acquisition process.
 - Technology for public communication.

Panel conclusions. The report makes it a point to note that of the high-priority needs identified, a significant portion can be addressed by adopting current innovations rather than developing new ones. The innovation agenda, then, is largely driven by adopting these tools and practices. Nevertheless, many of the identified priority needs would, indeed, require development of new tools or practices. Several challenges or changes requiring significant development of new tools or processes were given high priority despite risk in their development due to the significant benefits the panel assessed they would afford the court system. Altogether, the report resulting from the work with the advisory panel represents an important starting point in developing an innovation agenda for the many organizations and parties involved in the U.S. court system.

Future-Proofing Justice: Building a Research Agenda on the Effect of Technological Change on the Protection of Constitutional Rights and Legal Due Process

This report details an effort by the Initiative to examine the effects of new technologies and technological change on rights and due process in the justice system. The effort convened an expert panel of practitioners, legal scholars and experts on technology and individual rights to frame a research agenda focused on concerns related to these subjects. A questionnaire was distributed to panel members before a workshop. This questionnaire queried the panelists on the effects various technologies may have on different categories of rights. The results from this questionnaire were then used to craft the discussion agenda for the panel during the workshop, where the panel crafted a research agenda needed to guide the criminal justice community in protecting individual rights and due process while addressing emerging



technological questions. The panelists identified a series of themes in five key areas, with a tiered set of needs for each theme. Key findings from the panel discussion are outlined below, followed by a discussion of the identified themes and needs.

Key findings included:

- Changes in the manner and degree to which individuals integrate new technologies into their lives require a re-examination of the way in which data collected and used in criminal justice processes is viewed.
- The greatest number of needs identified by the panel focused on the challenge in imparting knowledge of the implications of technological change to participants in the criminal justice system and better enabling the adversarial process to handle increasingly complex technical questions.
- The top priorities of the panel included requirements for best practice and training development, addressing issues such as criminal justice data quality and its implications for individual rights, evaluation work to better understand how analytical tools like risk assessment instruments perform and fundamental research on topics such as how the exploding volume of electronic data could affect protection of rights.

Five key themes were identified that were helpful in categorizing and discussing the needs identified by the panel.

1. *Separability of technology from individuals' selves.* The increasing integration of new technology into individuals' daily lives introduces a unique challenge in the acquisition and use of the data they generate. The top priority need identified in this theme was the need for a taxonomy of new and emerging technologies, as well as the different categories of rights that taxonomy might affect, to aid in legal consideration.
2. *Reliability, usefulness and analytic quality of data.* As the volume of information individuals generate expands, so too may the need to process and understand it by the justice system, as well as ensure its quality and liability. High-priority needs identified in this theme centered on research into implications of expanding volume of data on different areas of the criminal justice system, tools to analyze it and best practices for managing and understanding it.

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3. *Appropriateness of the “third party doctrine” and the voluntariness of information sharing.* As a corollary to concerns with the increasing integration of technology into our lives and selves, concerns also arise related to whether or not an individual could truly “opt out” of using them and so justify their relinquishing of the expectation of privacy with respect to the data those technologies may share with third parties. Identified needs centered on examining the validity of the third-party doctrine and the need for guidelines for appropriate behavior for individuals on social media.
 4. *The effects of issues surrounding technical expertise on due process.* The implicit expectation that counsel will be experts or at least knowledgeable on electronically stored information (ESI) and will be able to educate the bench is problematic as forensic science becomes more technically advanced. It is not clear that counsel can, or should be, expected to keep up. Top tier identified needs included the need for training resources and new best practices for justice participants and ethical guidelines.
 5. *Effects on the justice process of the use of telepresence and virtual reality technologies.* The increasing use of videoconferencing and telepresence in court systems introduces questions as to the effects remote appearances may have on rights of defendants and the adversarial process. Top-tier identified needs include best practices for the use of telepresence, more research to assess where telepresence use is appropriate and determination of its risks and benefits.

The needs identified in the five themes discussed above were used to describe a research agenda that fell into three categories: best practices and training development, evaluation and fundamental research on technology and related issues. Participants in the criminal justice system need to be trained and prepared to handle the advent and integration of new technologies in the system and society. The outcomes of technological integration need to be evaluated. New technologies being developed lead to shortfalls in knowledge that require fundamental research to inform future decisions. The challenges associated with new technology in the criminal justice system require forward thinking and preparation, and the process described in this report details an effort to aid in this process.



Highlights

In addition to the above-mentioned reports, recent and ongoing Initiative efforts include the following efforts:

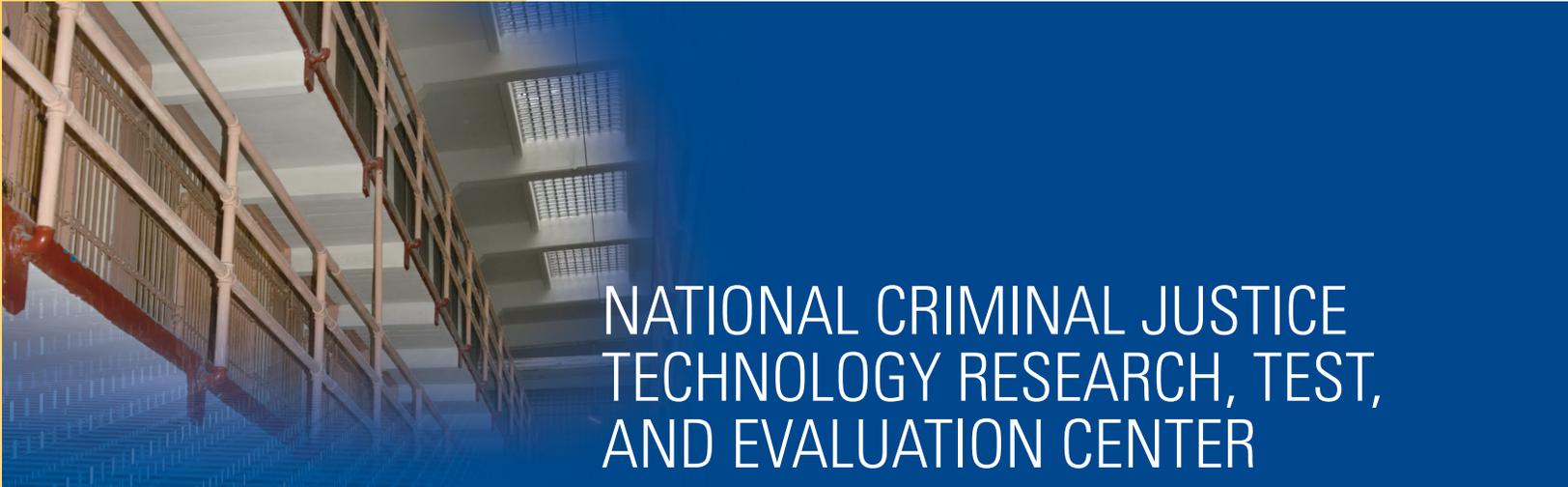
- **Improving School Safety.** The Initiative convened a school safety workshop in the Washington, D.C. area and incorporated findings from the two-day workshop with literature reviews on school safety and school safety technologies, case studies and expert interviews. Factors affecting the likelihood of violence in schools and technologies used to prevent school violence were identified and used to inform recommendations for improving U.S. school safety. This work helped to generate the report described in detail in an earlier section, which can be found at http://www.rand.org/pubs/research_reports/RR1488.html.
- **Strengthening law enforcement with future broadband technologies.** The Initiative convened an expert panel to discuss how law enforcement may take advantage of, and mitigate risks associated with, future broadband technologies. Themes identified and discussed as part of the workshop included both the emergence of a broadband network for secure communication for law enforcement at appropriate, convenient access points, and managing and understanding the data shared on this network. The panel identified and prioritized needs for future law enforcement broadband communications, and provided recommended actions and an S&T roadmap. A report from this work can be found at http://www.rand.org/pubs/research_reports/RR1462.html.
- **Reducing mortality in correctional facilities.** In May 2016, the Initiative convened an advisory panel to explore the issue of mortalities in correctional facilities. The intention of the panel was to produce a list of high-priority needs to be addressed in order to reduce mortality in correctional facilities. The panel, broken into two breakout groups focused on jails and prisons, assessed needs relating to five sources of mortality: homicide, suicide, accidents, drug or alcohol intoxication, and illness or disease. A report from this meeting will be released in early 2017.
- **Building an online community for justice professionals.** The Initiative sought to create a website that could enable justice professionals to exchange information with each other about new technologies and their own technological needs. This would, in turn, aid the Initiative in understanding the needs and challenges of the community and how new



technologies could address them. Work on building the website is ongoing, with a usable version expected in the first half of 2017.

- **Assessing the systemic impact of meeting criminal justice needs.** The Initiative is involved in an effort to develop a model of the criminal justice system to explore the potential cascading effects of meeting criminal justice needs identified in other elements of the project. Work is ongoing and expected to conclude in 2017.
- **Patent analysis and wearable technologies.** The Initiative has been involved in an effort to use patent analysis to examine emerging technology trends and needs for various partner agencies in order to identify opportunities for NIJ collaboration or new technology development in meeting needs identified in other areas of the project. After initial efforts to explore application of this methodology, the effort focused specifically on technologies related to wearable devices. A report on this work is being prepared and is expected in early 2017.
- **Corrections futuring effort.** In an effort to identify the current challenges facing the corrections sector and envision key desired improvements, experts from within the corrections sector were identified and interviewed. Interviewees were queried about the key obstacles or challenges they saw in corrections and were asked to describe key elements of a better system. A report from this interview effort is in review and is expected in early 2017.

For more information on the Criminal Justice Priority Technology Needs Initiative, contact Program Manager Steve Schuetz at (202) 514-7663 or by email at Steven.Schuetz@usdoj.gov.



NATIONAL CRIMINAL JUSTICE TECHNOLOGY RESEARCH, TEST, AND EVALUATION CENTER

Sharing Technology Information Knowledge From School Safety to Pursuit-Reduction, From Offender Tracking to Telecommunications

During the process of developing *A Comprehensive Report on School Safety Technology*, the staff at the National Criminal Justice Technology Research, Test, and Evaluation Center (RT&E Center) received the following note regarding chapter 2 from a member of the peer review team: “This chapter should be required reading for any schools or jurisdictions seeking funding support for the acquisition process.”

The RT&E Center, at the direction of NIJ, develops a wide range of products, one of which, *A Comprehensive Report on School Safety Technology* (<https://www.ncjrs.gov/pdffiles1/nij/grants/250274.pdf>), came about as part of NIJ’s response to the congressionally directed Comprehensive School Safety Initiative. In the report, the RT&E Center endeavored to accomplish the following objectives regarding school safety and security technologies:

- Identify technologies currently being used in K-12 schools to prevent, respond to and mitigate criminal acts of violence.



The Johns Hopkins University Applied Physics Laboratory (JHU/APL, www.jhuapl.edu), in partnership with the JHU Division of Public Safety Leadership (<http://psl.jhu.edu>), has established the National Criminal Justice Technology Research, Test, and Evaluation Center (RT&E Center) in Columbia, Md., to conduct focused RT&E activities to inform NIJ's technology research, test and evaluation efforts to enhance the capabilities of state, local, tribal and territorial criminal justice agencies. The RT&E Center also supports NIJ's efforts to develop and share knowledge with practitioners, policymakers and researchers regarding technologies or technology-related

issues for purposes of improving criminal justice policy and practice. The activities of this center vary from year to year depending on the needs of NIJ's science and technology RT&E efforts.

The RT&E Center is staffed by JHU/APL, the JHU Division of Public Safety Leadership and the JHU Bloomberg School of Public Health (<http://www.jhsph.edu>) The center conducts multiple concurrent projects using a core management team and project-specific scientists and engineers working in coordination with criminal justice end users and additional subject-matter experts.

- Identify how the technologies are being used (i.e., purpose, policy and practice).
- Identify what is known about the efficacy of those technologies.
- Identify factors such as laws, policies, regulations and costs that affect deployment and employment of technologies.
- Provide reports and other information to NIJ for dissemination to the various constituents that play a role in safety and security in schools.

A Comprehensive Report on School Safety Technology is intended to be used by a range of audiences, including school administrators, security directors, principals and others. It features four research components: a literature review, a technology review, case studies and a legal review. It examines the technologies currently being used, how they are used, how those technologies were chosen and how well they are working. By providing this context, school officials can make informed decisions about technology choices that can increase the safety of students, faculty and staff.

Pursuit-reduction Technology

In another major effort, the RT&E Center conducted an impact assessment of pursuit-reduction technology installed in multiple law enforcement agencies' vehicles. The final report, *Pursuit*



Technology Impact Assessment, first provides the context for the assessment of a relatively new pursuit management technology that tags and tracks a fleeing vehicle.

StarChase, the trade name for the system being assessed, is a GPS-based system that provides a capability for tracking a fleeing vehicle at a distance by launching and attaching a GPS-tracking tag to a fleeing vehicle and providing real-time data on the vehicle's location. The impact assessment of StarChase by the NIJ RT&E Center does not include investigation or analysis of the technical specifications or performance of the system; rather, it strives to describe how police operations are impacted by the use of the system. The following general findings are presented in the executive summary:

- GPS-enabled pursuit technologies such as StarChase extend police flexibility by providing remote tracking capability when line-of-sight vehicle tracking becomes unfeasible.
- Success or failure of a pursuit technology such as StarChase is related to the integration of the new technology into existing pursuit policies and practices.
- A technology/system “champion” who advocates for its use aids in the successful adoption and integration of a new pursuit technology.
- Law enforcement agencies that do not have a process in place for deploying and evaluating new technologies may lack the data required to comprehensively assess a technology's impact and effectiveness.
- Law enforcement agencies engaged in new technology deployment and evaluation would benefit from an end-to-end assessment process that includes the collection of comparable baseline data.

Communications and Networking Technology

By the end of 2016, the RT&E Center had completed a final report titled *Department of Defense/US Government Communications and Networking Technology for Law Enforcement: A Technology Survey*, and submitted it for NIJ review.

This report first presents the criminal justice community's critical communications and networking technology requirements and organizes them into associated technology



categories, which serve as a framework for the remainder of the document. Next, background information on the key communications and networking technology areas is provided to establish the necessary foundation for exploration of the technical details and specifications of the identified technology products. The technology survey section presents the currently available communications and technology products that have been identified for applicability to the criminal justice community. Lastly, a collection of emerging technology programs is provided as a portrait of which advanced communications and networking concepts could potentially service law enforcement and criminal justice community technology interests.

Body-worn Cameras

During 2016, the RT&E Center completed two reports on body worn camera (BWC) systems: *A Market Survey on Body Worn Camera Technologies* and *A Primer on Body Worn Camera Technologies*.

The market survey compiled information on the technical features of BWC devices and systems, presenting 66 BWC products from 38 vendors.

The primer provides a BWC technology overview and discusses the various operational contexts for the use of BWC and considerations for integration of BWC into current systems, including cost considerations, data uses, data storage, data management, access and security, training and policy. Legal implications, including privacy, are summarized.

Both reports were peer reviewed very favorably and reviewer comments have been incorporated. The final versions have been posted to NCJRS (Survey- <https://www.ncjrs.gov/pdffiles1/nij/grants/250381.pdf> and Primer- <https://www.ncjrs.gov/pdffiles1/nij/grants/250382.pdf>).

Video Analytics Software

The RT&E Center completed an assessment of a video analytics software system intended to perform person re-identification, whereby a person identified in one camera's field of view can be re-identified as the same person in a subsequent camera's field of view. The algorithms were developed by a University of Houston team. The system works in non-real time, using galleries of static video frames.



After receiving the software and getting it up and running, the RT&E Center team found that the software performance was less than hoped for. For example, it initially produced less than 20% correct top-ranking matches for a modest sized closed-set gallery of 15 people. After discovering and correcting some coding errors, the Center team found that the performance increased significantly, but the system still underperformed the community standard of Person Re-ID, the Symmetry Driven Accumulation of Local Filters (SDALF) algorithm.

An important finding is that there is a rapid decrease in performance with increasing gallery size. This was true for both the UH code and the community standard SDALF algorithm. Given the performance of the UH code and the community standard, SDALF, we believe that the field of Person Re-ID technology is not ready for operational use. Person Re-ID remains an important and useful concept for Law Enforcement but is currently best characterized as an area of active research by an international community of predominantly academic researchers.

In addition to the evaluation and documentation of the algorithms' performance, the RT&E Center produced two studies, *Video Analytics Market Survey*, and *Survey of Person Re-Identification Technology*.

Research Highlights

In other activities, the RR&E Center:

- Completed revisions based on peer review of the final report, *GPS Monitoring Practices in Community Supervision and the Potential Impact of Advanced Analytics*. The report is now available from the National Criminal Justice Research Service (<https://www.ncjrs.gov/pdffiles1/nij/grants/249888.pdf>).
- Completed revisions based on peer review of the final report, *Geospatial Monitoring of Community-Released Offenders: An Analytics Market Survey*. The report is now available from the National Criminal Justice Research Service (<https://www.ncjrs.gov/pdffiles1/nij/grants/250371.pdf>).
- Completed post peer review revisions to the final report titled *Market Survey of Location-Based Offender Tracking Technologies*. The report is available from the National Criminal Justice Research Service (<https://www.ncjrs.gov/pdffiles1/nij/grants/249889.pdf>).

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- Completed the final report, *Methods and Metrics for Measuring the Utility of Telecommunications in Law Enforcement* and submitted it for NIJ review. The objective of the study was to go beyond identifying standard performance measures of the FirstNet network by developing or identifying quantitative and qualitative metrics to assess if implementation actually facilitates law enforcement agencies' ability to complete their mission. The intention is that the evaluation methodology and metrics defined by this study will be used by the early adopter sites to evaluate the FirstNet capability and value added.
 - Developed *Technical and Operational Evaluation of Advanced Radio Technology for Law Enforcement*. This report is based on an RT&E Center evaluation to determine the technical value and applicability of NIJ-funded, university-developed demonstration systems and of the integrated platform that Engility developed for capability demonstrations of the university-developed prototypes. In particular, the study examined its applicability in current law enforcement environments. Another aspect of the study was to identify the current state of the art in advanced radio technologies related to those implemented in the university-developed prototypes.
 - Submitted a technical paper that will be presented at the Institute of Electrical and Electronics Engineers (IEEE) International Conference on Commercial Electronics 2017. The paper, *Massive MIMO for Dynamic Spectrum Access*, is based on research conducted for the communications and networking technology and advanced radio technology projects.
 - Completed a comprehensive market survey that identifies more than 100 contraband detection systems available from 33 vendors for use in the corrections community. Technologies capable of effectively detecting contraband represent a current and evolving need in the corrections community. To organize the various contraband detection technologies, products were divided into three categories of detection: person-borne (68 products), vehicle-borne (17 products) and environmental (19 products). The final report has been submitted for NIJ review.

Training and Criminal Justice Community Engagement

During 2016, RT&E Center staff attended the following conferences and venues:

- IEEE Wireless Health 2016 at the National Institutes of Health, Bethesda, Md.



- International Association of Chiefs of Police (IACP) Law Enforcement Information Management Conference, Dallas, Texas.
- IACP Annual Meeting, San Diego, Calif.
- National Fusion Center Association Training Event, Alexandria, Va.
- Site visit to Broward County Sheriff's Office, Fla.
- Site visit to Michigan State Police, Lansing, Mich.
- Quattrone Center Symposium: Technology in Criminal Justice Reform, University of Pennsylvania School of Law, Philadelphia, Pa.
- Site visit to BAE Systems, Merrimack, N.H.

Work in Progress at the End of 2016

The RT&E Center started, but did not complete, the following projects:

- A study to provide an operational evaluation of the Performance Management Information System (PMIS) developed by the RAND Corporation for corrections personnel. Working in collaboration with the Broward County (Fla.) Sheriff's Office, the study will report on the performance of the system itself and the methods used in its implementation, and provide observations and recommendations for future implementations of the system.
- A technical assessment of a prototype crash avoidance system developed by the Massachusetts Institute of Technology and BAE Systems called *Divert & Alert*, which is intended for use during roadside traffic stops at night. The system has a video analytics component to identify potentially dangerous approaching vehicles and alert the officer and a laser "flare" generator to divert the oncoming vehicle.
- An operational evaluation of small, unmanned aerial systems for use in crash scene reconstruction. The project is being conducted in partnership with the Illinois State Police and the Michigan State Police, and includes discussions with other law enforcement aviation units and crash reconstructionists employing drone technology.



Ongoing market surveys include the following:

- Contraband detection systems available for use in the corrections community.
- Offender risk assessment systems and methods.
- Early intervention systems for law enforcement officers.
- Voice translation (speech-to-speech) technologies.
- Social network analysis technologies.

Testing on the following emerging technologies began late in the year:

- Video conferencing technology for pretrial hearings.
- 360° camera systems for patrol vehicles and other applications.
- Body-wearable sensors for health and wellness monitoring of law enforcement and corrections officers.
- Wireless power transfer systems for use in law enforcement patrol cars to charge devices.

For more information on the National Criminal Justice Technology Research, Test, and Evaluation Center, contact NIJ Research Division Director Bill Ford at (202) 353-9768, email William.Ford@usdoj.gov.



FORENSIC TECHNOLOGY CENTER OF EXCELLENCE

Developing a Variety of Products to Help the Field of Forensic Science

Landscape reports on DNA tools and 3D crime scene scanning tools...developing a plan for more efficient, longer-lasting laboratories...creating a one-of-a-kind glossary of terms related to sexual assaults...offering a free “virtual reality” tool to teach a new technology. All of these projects, and more, make up the diverse and extensive portfolio of products produced by the NIJ Forensic Technology Center of Excellence (FTCoE) in 2016.

Landscape Report on MIST Tools Lays Out Key Information (TechBeat, April 2016)

Brochures. Fact sheets. Reviews clipped from technical journals. All of them laid out in different formats, all of them promoting different types of information. Sometimes it’s hard for a decision maker to be sure everything in the pile is actually “fruit,” let alone whether they’re all “apples.”

At least when it comes to selecting a DNA mixture interpretation software tool (MIST), the FTCoE has sorted a confusing pile into a



document that makes sure no apples-to-oranges comparisons have accidentally become part of the process.

Demystifying MIST: Landscape Report for DNA Mixture Interpretation Software Tools (available at <https://rti.connectsolutions.com/mist/>), presents a landscape overview of 13 MIST tools (for more details on the report contents, see sidebar, “Providing a Basic Understanding of What’s Out There.”)

“There’s a lot of information out there on mixture interpretation software tools, and it’s confusing. You hear different things from vendors, at workshops, at conference booths and in the media. There are just all these pieces of information,” says Dr. Patricia Melton, senior research forensic scientist at FTCoE. “Administrators were struggling with how to get all of the necessary information, and how to use it to make the best decision for their laboratories.”

With that in mind, FTCoE staff set out to create a “one-stop shop” resource that presents information “without a pitch, without a spin on it, to help the laboratory figure out what is best for an agency based on its needs.”

FTCoE staff talked to manufacturers, developers, practitioners, academics and researchers, as well as conducted an extensive literature review, to inform the report. Key is a table that lays out characteristics of the 13 MIST reviewed side-by-side: “We’ve gotten nothing but positive feedback about that table. People keep saying this is the best table ever, it gave them the roadmap they needed. It lets you look at everything side by side, and you can pick out the characteristics you want and narrow down your choice.”

For administrators and procurement coordinators who do not have a technical background, the overview and summary sections present a non-technical viewpoint that helps them key in on questions to ask of their forensic specialists. Melton says that no one wants to be in the position of simply signing off on something because someone else requested it, and these non-technical portions of *Demystifying MIST* will help them learn the information they need.

“It was challenging to find a format. If someone wanted to know more about Software Tool X, we didn’t want them to have to read through 30 pages of text looking for bits and pieces about it. The way the report is set up with individual profiles from the laboratories and from the vendors on each tool, a reader can turn right to the tool or tools they’re interested in and get



what they need,” Melton says. “We worked hard to partition it so someone doesn’t have to sit with a bunch of highlighters and make notes.”

The report also focuses, in a highly technical fashion, on the need for a strong validation plan, and a table lists stakeholders who are willing to share their validation plans and provide guidance to laboratories just starting the process. Melton says she can’t say enough good things about the cooperation and collaboration the FTCoE received from the forensic field, as laboratory representatives told her: “It took us four tries to get a good validation plan and we’re happy to share it, and we’re happy to look at someone else’s plan and offer feedback.”

PROVIDING A BASIC UNDERSTANDING OF WHAT’S OUT THERE

Demystifying MIST: Landscape Report for DNA Mixture Interpretation Software Tools summarizes considerations that impact procurement of, training with and validation using DNA mixture interpretation software tools (MIST). It offers a basic understanding of tool use, benefits and limitations, and provides a landscape view of currently available MIST to assist forensics decision makers with their procurement and training plans. To help them choose the tool that best meets their needs, the FTCoE explored software features, validation considerations, technical support and training options.

Demystifying MIST includes a literature review, profiles provided by vendors and profiles provided by labs that have evaluated tools, and key findings and recommendations, including:

- Finding a software tool that fits the laboratory’s need is critical. Potential areas to evaluate include time of analysis, type of interpretation model the software performs, and type of training and support offered.
- Laboratories must look beyond the initial cost of the tool and consider intermediate and long-term financial commitments. Even if a laboratory chooses one of the free tools, substantial resources are needed for labor associated with the validation and analyst training. Additional cost considerations include maintenance agreements.
- Training should cover three major areas: the application of the LR, the math model the tool uses and the correct use of the tool, all of which will need to be explained fluently in court.
- The internal validation process for implementing a DNA mixture interpretation software tool will be challenging, as the scope of the validation must incorporate both the mathematical and the software components of the chosen system across a variety of samples that mimic the complex mixtures observed in casework. Therefore, the laboratory should be cognizant of additional resources in labor, time and finances to support the scope of the validation, as it will be a more extensive process than that of previous validation studies.

(Adapted from Demystifying MIST, Overview pp. 1-3, Summary p. 33.)



Study Surveys 3D Crime Scene Scanning Devices (TechBeat, June 2016)

Suppose you could purchase a new technology for your department that both promoted traffic safety and saved time for your forensics department. Sound good?

But suppose that same technology came with a high price tag and continuing maintenance costs. Now what?

The technology in question is 3D laser scanning, a mature technology used for a number of years in fields such as surveying, and now coming into more common use for scanning accident and crime scenes. The FTCoE, in an effort to help public safety departments make decisions about its implementation, has released *Landscape Study on 3D Crime Scene Scanning Devices*, a January 2016 report that provides a basic understanding of 3D laser scanning instruments; their uses, benefits and limitations; and an impartial comparison of the features and capabilities of commercially available devices. FTCoE landscape study reports provide a broad view of issues and products identified as having value and usefulness in forensic applications.

Project Director Jeri Roper-Miller says that the FTCoE undertook this project for the same reason it has carried out several other landscape studies: “To provide the general forensics community with an informative, but not overly technical, overview of a useful product. We see a lot of confusion about 3D scanning products, and it’s challenging for departments to compare features from different manufacturers. We tried to find the commonalities and present an impartial overview of the advantages and disadvantages.”

To that end, the report presents a chart comparing available devices, and offers profiles from both manufacturers and users, including lessons learned in the field. It also includes a list of subject-matter experts and stakeholders consulted, a glossary of commonly used terms and a sample methodology for use.

According to the report, significant benefits to using 3D laser scanning technology include accuracy, precision and objective data collection, and it also may find relevant evidence or patterns not otherwise visible. Crime scene units use 3D laser scanning instruments to gain increased speed and efficiency with obtaining data for bloodstain pattern analysis, shooting incident reconstruction, traffic collision data collection and general crime scene reconstruction.



The technology captures the entire geometry of the scene, ensures longevity in scene preservation and provides crime scene analysts with capabilities to evaluate the scene and evidence in a holistic manner. In addition to decreasing the time required on scene at traffic accident investigations, the technology may also be used to promote first responder safety in HazMat events by allowing collection of evidence from a safe distance.

“In the past, crime scene reconstructions were hand drawn, and creating them was very labor- and time-intensive,” Senior Project Manager Rick Satcher says. “The 3D scanning technology saves time and labor, and provides for longevity and preservation in a virtual manner. Because of this, the evidence collected through these instruments is readily accepted in courts of law and is not subject to the sort of questioning that happens with other types of evidence.”

Offsetting all these advantages are ongoing considerations about the price. Although the technology may be obtained for prices in the neighborhood of \$50,000, Satcher says, devices with extensive features may still cost in excess of six figures. Smaller agencies that may not require day-to-day use of 3D laser scanning might consider sharing a device with other smaller jurisdictions nearby, or possibly even looking into leasing devices as needed.

In addition to looking for ways to save on purchase costs, smaller agencies might also consider train-the-trainer programs to help offset costs in those areas. Although the majority of users are trained crime scene investigators, in a smaller agency it may be necessary to train non-forensic officers on how to collect data for future analysis by CSI staff. Yearly maintenance fees are another cost consideration, the report says.

“Another key issue is post-processing requirements. The software is cutting-edge and you need a computer that has the power and graphics capabilities to render these images. Be sure to check what computing capabilities are required before purchasing a 3D scanner,” Satcher says.

“It’s like a car: you can get the deluxe sports version with all the bells and whistles, or you can get the economy model. You have to balance your desires against your budget, and we tried to indicate that,” he adds. “The field is quite mature because the devices have been used for surveying and other purposes for a long time. These are expensive, advanced instruments that are rugged and work well. Because of all of these considerations, trying to decide what will work best for a particular agency may be challenging, and we hope the report will help.”



You can download *Landscape Study on 3D Crime Scene Scanning Devices*, a 56-page pdf, from <https://rti.connectsolutions.com/p43i2d67cjb/>.

Roadmap Leads to Increased Efficiency, Improved Function in Forensics Labs (TechBeat, September 2016)

“Thank you all for coming. As you know, we’re about to start the planning process for our new crime laboratory, and this will be the planning team. I’m so pleased that everyone made it to this important first meeting.”

“Excuse me, but did you say this is everyone? I see members of our administration and representatives from the architectural team, but what about the technicians? They’ll be the ones actually working in the lab; I think they would have some ideas that we need to hear.”

Avoiding scenarios like the one described above is just one takeaway a crime lab might get from *Development of a Lean Facility Design Roadmap for Design-Bid-Build Forensic Facilities*, released in April 2016 and prepared by the FTCoE.

Development of a Lean Facility Design Roadmap reports on the creation of guidelines and checklists based on Lean Facility Design (LFD) principles and integrates them with the guidance in *Forensic Science Laboratories: Handbook for Facility Planning, Design, Construction and Relocation* (also known as the “White Book”). That 2013 publication from NIJ and the National Institute of Standards and Technology (NIST) has been considered the “gold standard” in laboratory design and planning, and the new FTCoE publication complements it by developing a roadmap for planning and constructing 21st century Design-Bid-Build forensic facilities, moving beyond the traditional model that keeps everything separate and compartmentalized.

“What surprised me in this project is the finding that nontechnical issues and concerns need to be considered as well,” says Rudi Luyendijk of the Midwest Forensics Resource Center in Ames, Iowa, who served as project lead. “By not involving — or only minimally involving — staff in the facility design process, nontechnical issues and concerns only infrequently surface and hardly ever are incorporated. We found that this is a mistake. Crime lab staff should be actively involved in the facility design process from the onset to ensure that a highly efficient



and effective forensic facility is designed and constructed that meets the expectations of both the crime lab customers and the crime lab staff for decades to come.”

A technical assistance group representing several forensics labs that had just completed, or were in the process of designing, new facilities met three times to help inform the contents of *Development of a Lean Facility Design Roadmap*, and the FTCoE learned about both the technical and nontechnical concerns that played into these labs’ planning decisions during those meetings. Their input played a key role in the development of the blueprint outlined in the report.

“This project takes the Lean Design proven successful in the health care field and applies it to forensic facilities. It takes the planning process one step further to increase the improvement of information flow, efficiency and costs,” says Ropero-Miller. “And while we looked at it from the labs’ perspective, the principles definitely would be useful in planning law enforcement command centers, intelligence centers or any other facility of this type.”

Ropero-Miller says the report’s checklists and LFD roadmap help walk planners through “the whole process of logical thinking and what you need to do. What the report really emphasizes is that although you have many considerations, you need to keep it simple to meet your organization’s needs and also be inclusive of the staff who will be working in the facility. If you follow this process, you should get the facility you need for not only the immediate future, but for decades to come.”

The concept of designing a facility that might last 20 or even 30 years differs from the typical design and planning process, she says. Luyendijk also emphasizes the importance of that concept: “When you build one of these facilities, you build for the future. By following this kind of path, you’re creating a facility to be used for the next 20 years or so, maybe even longer than that. Typical design is only for the immediate future, and this is more of a long-term view.”

Because the premise behind the project is to design for the long term, both Ropero-Miller and Luyendijk emphasize the importance of involving the staff who will use the facility throughout the process.

DEVELOPMENT OF A LEAN FACILITY DESIGN ROADMAP FOR DESIGN-BID-BUILD FORENSIC FACILITIES: A SUMMARY

Lean Design is a powerful way of aligning employee satisfaction, process efficiency and product quality with customer satisfaction. It does so by focusing on the systematic identification and elimination of unnecessary and nonvalue-added activities involved in producing a product or delivering a service to clients. LFD mirrors the standard approach to facility design and links the classical design criteria of materials, personnel, equipment and finished product with operational considerations like information flow and value stream performance measurement. It answers questions such as the following:

- How can we improve our current work process?
- How should the physical space be configured to support this improved work process?
- How can we ensure the delivery of a quality product?
- Lack of ensuring that a facility will meet the needs of the future.
- Lack of measurable metrics.

The project had three objectives:

- Developing guidelines for operational excellence.
- Creating checklists for planning, design and construction.
- Integrating these guidelines and checklists with the National Institute of Standards and Technology's *Forensic Science Laboratories: Handbook for Facility Planning, Design, Construction and Relocation* (the "White Book"), (although the roadmap created for Development of a Lean Facility Design can also stand alone).

The FTCoE recruited participants from state and local crime laboratories that were either in the process of building a new facility, renovating an existing crime laboratory or just completing construction. This group met with a facilitator and a representative from a commercial architecture and engineering firm who was familiar with both the forensic facility design process and the NIST White Book.

The group identified the following gaps:

- Lack of involvement in planning by forensic laboratory personnel.

The group went on to develop a checklist and a design model that provides for better communication between the designer, builder and user of the forensic facility; facilitates the planning, design and construction of forensic facilities to achieve operational excellence both now and in the future; and allows for assessment of the LFD impact on crime laboratory construction and crime laboratory operation process improvements. The checklists and guidance were then converted into a roadmap to facilitate easy implementation and use of the LFD process. (The above text is derived from *Development of a Lean Facility Design Roadmap for Design-Bid-Build Forensic Facilities*, pp. 1-2, p. 21.)

"What we designed is a roadmap that supplements the NIST White Book. It's basically a blueprint on how you go about using Lean designs and principles to build or renovate a crime lab facility for the future," says Project Lead Rudi Luyendijk. "The next step is working with a lab to validate the work. This is likely to be done in phases: facility planning, facility design and crime lab relocation. We have begun working with the sheriff's office crime lab in Broward County, Fla., to validate the LFD planning process, and are looking for other labs interested in validating the actual LFD design process and crime lab relocation methodology as well. "



“Within the technical assistance group, a variety of issues came up that were important to one lab, but not to others,” he says. “Nonetheless, they had a commonality in that they were all striving for increased customer satisfaction and a more efficient process.”

Ropero-Miller cautions that the design process itself can take several years, factoring in budget approvals, preplanning, working with architects and contractors, and finally moving into the new or renovated space.

“For some organizations, the whole process can take seven to 10 years. What we’ve designed is a roadmap, a blueprint that incorporates LFD principles and can be used to supplement the NIST White Book,” she says. “And it’s in keeping with the mission of the FTCoE in that we try to provide tools to the forensics community that help not only with technology implementation, but also with implementing other best practices that can improve operations.”

Download the report at <https://www.forensiccoe.org/Our-Impact/Advancing-Technology/Reports/Development-of-a-Lean-Facility-Design-Roadmap-for-Design-Bid-Build-Forensic-Facilities>.

Highlights

Other activities performed by the FTCoE in furtherance of its mission to provide current research and information to the forensic professional community are described in its 2016 report, which is available for download at <https://www.justnet.org/resources/publications.html>

For more information on the Forensic Technology Center of Excellence, contact Program Manager, OIFS Director, Gerald LaPorte at (202) 305-1106 or by email at gerald.laporte@usdoj.gov.



CONCLUSION

Through 2017 and beyond, the National Law Enforcement and Corrections Technology Center (NLECTC) System will continue to fulfill an ongoing mission to provide information on technology development and innovation to the criminal justice community. Through its component centers, the NLECTC System will continue to connect decisionmakers in the law enforcement, courts and corrections communities with the latest information on NIJ's RDT&E portfolio and other relevant technology developments. Its efforts inform and support NIJ in its mission to identify best practices, and sponsor research and development that will benefit the criminal justice community and address its most pressing needs. The component centers will continue to play a crucial role in enabling NIJ to help law enforcement, corrections, courts and other criminal justice agencies address their technology needs and challenges.

