



## IN-BRIEF

# The NIJ Forensic Laboratory Needs Technology Working Group— Progress to Date and Future Plans



“I’m very pleased to welcome the newly created working group members and grateful for their willingness to take part in this important endeavor. I look forward to hearing their valuable input and working together toward strengthening the relationship between the Justice Department and forensic science practitioners.”

—David Muhlhausen, NIJ Director

## Introduction

Recognizing the many challenges associated with adopting new technologies and other innovations in forensic science organizations, the National Institute of Justice (NIJ) formed the Forensic Laboratory Needs Technology Working Group (FLN-TWG) in 2018. FLN-TWG provides a forum for which forensic practitioners and researchers can develop coordinated approaches to addressing technology implementation challenges for the forensic science community.

Housed at NIJ and supported by the Forensic Technology Center of Excellence (FTCoE), FLN-TWG membership is comprised of crime laboratory directors or managers and academic researchers who meet regularly to share ideas, assess the impact of new technologies on the criminal justice system, and identify paths forward for implementation. The group’s mandate encompasses the full range of needs facing federal, state, local, and tribal jurisdictions; FLN-TWG is designed to clear roadblocks that have prevented broad, successful adoption of promising technologies.

## What is the FLN-TWG’s Purpose?

Implementing new and innovative technologies into forensic laboratories plays a major role in [technology transition and the continuous improvement](#) of forensic science. NIJ has invested heavily in scientific research and development (R&D) related to various [forensic science disciplines](#), and there have been many successes related to these efforts that range from [operational improvements](#) to [laboratory techniques](#). Technologies that provide value to the forensic community must address practitioner needs in a manner that equally prioritizes improving efficiency while maintaining quality. In many cases, additional work is needed to adopt new approaches into practice and educate forensic science professionals about best practices to maximize impact. The FLN-TWG collaborates with NIJ, FTCoE, and forensic science organizations to guide the community across those implementation hurdles.

## Objectives

- ▶ Introduce the NIJ FLN-TWG and its functions to the forensic community.
- ▶ Summarize the FLN-TWG’s goals and outputs of the first meeting.
- ▶ Inform the community of upcoming FLN-TWG deliverables.

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The FLN-TWG was created pursuant to 6 U.S.C. § 162(b)(2) and intended to identify and address the forensic technology needs of federal, state, local, and tribal law enforcement agencies. Through this working group, the NIJ intends to accomplish the following:

1. Identify the needs and operational requirements of forensic laboratories when implementing technologies used in investigative and forensic science applications.
2. Assess how new technologies, methods, and practices affect federal, state, local, and tribal law enforcement and crime laboratories.
3. Evaluate newly developed technologies and operational readiness to provide advice on federal, state, local, and tribal priorities and implementation strategies.
4. Assess and support implementation of research, technologies, and practices, and advance systems-based strategies in response to technological needs.

The FLN-TWG will focus on the transition of scientific research and evidence-based innovation into operational forensic improvements that will produce measurable impacts in forensic science organizations. This group will support NIJ’s mission to help ensure that forensic technologies are relevant and responsive to the laboratory operations needs of forensic practitioners.

## Who Makes up the FLN-TWG?

Members were selected to achieve a diverse balance of backgrounds, experience, expertise (professional and scientific), points of view, and geographical diversity. The group represents the viewpoints of crime laboratory leaders who are preparing to test, validate, and implement emerging technologies and methods, and is supported by researchers with experience in developing forensic technologies and examining the resources needed to keep pace with the increasing demand for services. Table 1 lists the current FLN-TWG members and their current professional roles.

**Table 1:** FLN-TWG members and their affiliations

Name	Title	Jurisdiction/Affiliation
Jose Almirall	Professor, Department of Chemistry and Biochemistry; and Director, Center for Advanced Research in Forensic Science	Florida International University
Kevin Ardoin	Laboratory Director	Acadiana Criminalistics Laboratory, Louisiana
Les Barnett	Director, Center for Forensics, Information Technology and Security	University of South Alabama
Angelo Della Mana	Director	Alabama Department of Forensic Sciences
Matthew Gamette	Laboratory Systems Director	Idaho State Police Forensic Services
Jan Girten	Deputy Director	Colorado Bureau of Investigation Forensic Services
Wesley P. Grose	Director, Scientific Services Bureau	Los Angeles Sheriff’s Department
Arlene Hall	Commander, Forensic Sciences Command	Illinois State Police
Lesley Hammer	Forensic Scientist	Hammer Forensics, Anchorage, Alaska
Brian Hoey	Laboratory System Director	Missouri State Highway Patrol
Linda Jackson	Director	Virginia Department of Forensic Science
Sarah Kerrigan	Professor, Department of Forensic Science	Sam Houston State University
Timothy Kupferschmid	Chief of Laboratories	New York City Office of Chief Medical Examiner
Troy Lawrence	Sergeant, Digital Forensic Laboratory	Fort Worth Police Department
Steven O’Dell	Chief, Science & Management Services Division	Baltimore Police Department
Tim Rohrig	Director	Sedgwick County Regional Forensic Science Center, Kansas
Jenifer Smith	Director	District of Columbia Department of Forensic Sciences
Paul Speaker	Professor, College of Business & Economics	West Virginia University
Stephanie Stoiloff	Senior Police Bureau Commander	Forensic Services Bureau, Miami-Dade Police Department
Peter Stout	President and CEO	Houston Forensic Science Center
Peter Vallone	Leader, Applied Genetics Group	National Institute of Forensics and Technology
Jody Wolf	Crime Laboratory Administrator	Phoenix Police Department Crime Laboratory



## What Is the FLN-TWG Currently Working On?

On October 2–3, 2018, FLN-TWG assembled for its first meeting to discuss technical and applied research needs for a variety of forensic disciplines. This meeting involved presentations from several crime laboratory representatives and federal agencies to highlight current initiatives that may benefit state and local crime laboratories and inform the FLN-TWG agenda. —Meeting topics included the following:

- Drugs and toxicology
- [Department of Justice \(DOJ\) priorities, forensic science policies and grant programs](#)
- Firearms examination technology and initiatives
- Advanced biological and DNA technologies
- Sexual assault kit (SAK) tracking, metrics, and definitions
- Stress, vicarious trauma, and workforce resiliency in laboratories
- Digital evidence technologies
- Overview of forensic science R&D programs

The FLN-TWG discussed the technology needs of forensic laboratories as well as the criminal justice system at large and considered innovative solutions that focus on technology transition (specifically technical testing and evaluation), information exchange, and training and capacity building of the forensic science infrastructure. Practitioners who successfully implemented technologies into their jurisdictions provided valuable insight about practical considerations for adopting new processes and devices. A valuable output from the session was a list of helpful resources that crime laboratories could leverage to improve their use of advanced technologies in practice, shown in Table 2. The list is not comprehensive and includes items related to the October 2018 discussions only. To date, the FLN-TWG has convened three meetings to continue work on identified needs and promising technology transition efforts.

**Table 2:** List of programs and resources that can help promote technology adoption by crime laboratories

Organization	Program	Overview	
Drugs and Toxins	<a href="#">DOJ</a>	<a href="#">Opioid enforcement and prevention efforts</a>	
	<a href="#">Drug Enforcement Administration (DEA)</a>	<a href="#">Special Testing and Research Lab</a>	<ul style="list-style-type: none"> <li>• The Emerging Trends Program monitors Novel Psychoactive Substances trends based on seized drugs analyzed by the DEA, and reports through the <a href="#">National Drug Early Warning System</a>.</li> <li>• Fentanyl Signature Profiling Program: Analyzes data and generates forensic investigative leads for opioid seizures; also supports state and local agencies in response to overdose deaths.</li> <li>• Technology Evaluation Group: Helps laboratories choose and implement technologies; also conducts their own technology evaluations.</li> </ul>
		Real-Time Communication Network	A vetted community of drug experts sharing knowledge, which enables quick dissemination of information (e.g., new drugs being synthesized, new trends).
		<a href="#">Scientific Working Group for the Analysis of Seized Drugs</a>	Resource center for forensic laboratories, including a mass spectrometry and infrared library of drugs.
	<a href="#">Customs and Border Protection (CBP) Laboratories and Scientific Services Directorate</a>	Field Triage Infrared Reachback Program	Field testing and lab analysis program, which uses handheld Fourier-transform infrared spectroscopy equipment to provide presumptive results for illicit substances in the field. The group has tested and purchased multiple handheld analyzers for illicit drug detection.
		<a href="#">Teleforensics Center (TFC)</a>	24/7 technical resource for events in which a weapon of mass destruction is suspected.
		<a href="#">Interdiction Technology Laboratory</a>	Characterizes new drugs being discovered and relays new trends and relevant information back to CBP.

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Organization (continued)		Program (continued)	Overview (continued)
Drugs and Toxins	National Highway Traffic Safety Administration (NHTSA) Drug-Impaired Driving Toxicology/Data Collection	<a href="#">Problem Driver Pointer System</a>	This is a database of the National Driver Register of drivers with motor vehicle licenses that have been revoked, suspended, cancelled, or denied, or those convicted of serious traffic offenses.
		<a href="#">Fatality Analysis Reporting System</a>	The system is a compiled database that catalogues police-reported traffic crashes, which can be used to identify trends in vehicular accidents.
		<a href="#">State Criminal Justice System Capacity Working Group</a>	This stakeholder group identifies priorities, develops tools, and builds recommendations for addressing drug-impaired driving.
		<a href="#">Toxicology and Data Collection Working Group</a>	This stakeholder group works to establish toxicology guidelines and data collection recommendations for drug-impaired driving. They are currently reviewing data from the Center for Forensic Science Research & Education and the National Safety Council's updates for <a href="#">Recommendations for Toxicological Investigation of Drug-Impaired Driving and Motor Vehicle Fatalities</a> .
	Centers for Disease Control and Prevention (CDC)	<a href="#">Laboratory Response Network for Chemical Threats</a>	The program supports chemical testing laboratories in 62 areas that include U.S. states, territories, and metropolitan areas; additionally, the program provides emergency response to chemical threats and chemical exposures.
		<a href="#">National Center for Health Statistics</a>	This center is currently looking into ways to improve mortality data collection and infrastructure.
Research and Special Topics	National Institute of Justice (NIJ)	<a href="#">Paul Coverdell Forensic Science Improvement Grants Program</a>	The NIJ provides funding to states and units of local government to help improve the quality and timeliness of forensic science and medical examiner/coroner services. These funds can be used for personnel, computerization, laboratory equipment, supplies, accreditation, and education, training, and certification.
		<a href="#">Sexual Assault Forensic Evidence-Inventory, Tracking, and Reporting Program Grant Program</a>	The NIJ funds state, local, and tribal agencies to develop and implement an evidence management system for untested and unsubmitted Sexual Assault Kits (SAKs.)
		<a href="#">DNA Efficiency Improvement and Capacity Enhancement Program (EICE)</a>	The NIJ provided funds in FY2017 and FY2018 for a competitive grant program through the DNA Capacity Enhancement for Backlog Reduction Program (CEBR).
		Other Programs	<ul style="list-style-type: none"> <li><a href="#">National Missing and Unidentified Persons System (NamUs)</a></li> <li><a href="#">DNA CEBR Program</a></li> <li><a href="#">Strengthening the Medical Examiner-Coroner System</a></li> <li><a href="#">Postconviction Testing of DNA Evidence</a></li> </ul>
		<a href="#">Forensic Science Research and Development Program</a>	<ul style="list-style-type: none"> <li><a href="#">Research and Evaluation for the Testing and Interpretation of Physical Evidence in Publicly Funded Forensic Laboratories</a></li> <li><a href="#">Research and Development in Forensic Science for Criminal Justice Purposes</a></li> </ul>
		NIJ Interoffice Solicitations	<ul style="list-style-type: none"> <li><a href="#">Research and Evaluation on Drugs and Crime</a></li> <li><a href="#">Graduate Research Fellowship Program in Science, Technology, Engineering and Mathematics</a></li> <li><a href="#">Research and Evaluation in Safety, Health, and Wellness in the Criminal Justice System</a></li> </ul>
		DOJ Special Topics	Needs Assessment of Forensic Laboratories and Medical Examiner/Coroner Offices
	Advisory Committee on Evidence Rules		DOJ represented in a committee discussing the change in Rule 702 in response to the President's Council of Advisors on Science and Technology report titled <i>Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature-Comparison Methods</i> .



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Organization (continued)	Program (continued)	Overview (continued)	
Firearm Technology and Initiatives	<a href="#">Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF)</a>	<a href="#">Crime Gun Intelligence Centers (CGIC)</a>	25 centers collect and analyze evidence in shooting cases using the <a href="#">National Integrated Ballistics Information Network (NIBIN)</a> and <a href="#">eTrace</a> . The CGIC aims to help identify serial shooters and connect shooting incidents.
		<a href="#">NIBIN National Correlation and Training Center</a>	The ATF provides support to 32 sites and 182 law enforcement agencies with correlational review of exhibits, which are peer-reviewed and technically reviewed by a firearm examiner.
	<a href="#">Bureau of Justice Assistance (BJA)</a>	<a href="#">CGIC Initiative</a>	The initiative is a joint partnership between the ATF and BJA that awards grant funding for cities to implement the CGIC model.
		<a href="#">National Resource and Technical Assistance Center for Improving Law Enforcement Investigations</a>	BJA conducts site assessments to help develop CGIC strategic plans, develop CGIC best practices, and provide opportunities for sites to develop long-term CGIC capacity.
<a href="#">Federal Bureau of Investigation (FBI)</a>	<a href="#">Firearms/Toolmark Unit</a>	The FBI conducts evaluations of firearm- and toolmark-related technologies to provide objective information for agencies looking to implement new technologies.	
Advanced Biological and DNA Technologies	<a href="#">National Institute of Standards and Technology (NIST)</a>	<a href="#">STRSeq</a>	The STR Sequencing Project is a collaboration among <a href="#">NIST</a> , <a href="#">King's College</a> , the <a href="#">University of North Texas Health Science Center</a> , and <a href="#">University of Santiago de Compostela</a> that aggregated allele data from their sequencing studies. NIST is developing a user interface at <a href="#">STRseq.nist.gov</a> to encourage laboratories to submit their population data.
Stress, Trauma, and Workforce Resiliency	<a href="#">Office for Victims of Crime (OVC)</a>	<a href="#">Vicarious Trauma Toolkit</a>	The OVC has developed resources to help individuals, managers, and leaders address vicarious trauma. Resources focus on personnel who work in the areas of law enforcement, fire services, EMS, and victims services.
R&D Updates	<a href="#">National Policing Improvement Agency (NPIA)</a>	National Footwear Reference Collection (NFRC)	The NFRC is a database of more than 30,000 outsoles that helps determine what kind of shoe left an impression at a crime scene.
	Project <a href="#">FORESIGHT</a> (including <a href="#">American Society of Crime Laboratory Directors [ASCLD]</a> )	<a href="#">Project FORESIGHT 20/20</a>	Project FORESIGHT links data from casework, budget, and personnel to examine resource allocation, efficiencies, and value of services. The FORESIGHT 20/20 project generates performance reports and evaluations from data uploaded from a laboratory's information management system (LIMS). The project is made up of a network of 139 laboratories (mostly of which are Western African and Latin American National Laboratories). FORESIGHT is currently working with ASCLD to develop a software interface bridging a lab's current LIMS and their financial and personnel management systems.
Laboratory Efficiency and Standards	<a href="#">NIST Forensic Science Standards Board</a>	<a href="#">Organization of Scientific Area Committees (OSAC) for Forensic Science Registry Implementation Plan</a>	This resource describes multiple ways in which forensic laboratories can implement OSAC standards.
	<a href="#">DOJ Forensic Science</a>	<a href="#">Uniform Language for Testimony and Reports (ULTR)</a>	The ULTR is a collection of documents that provides common language for testimony and reports concerning forensic disciplines. These documents are meant to improve consistency in language and ensure that probative statements are properly conveyed in court.



## Conclusion: What's Next for the FLN-TWG?

The FLN-TWG continues to meet and discuss key issues related to forensic improvement; this group has established four subcommittees that will focus efforts in the following high-priority areas:

1. Next-generation sequencing for DNA analysis
2. 3D optical topography for firearms/toolmark identification
3. High resolution mass spectrometry for controlled substance analysis
4. Proteomic mass spectrometry for bodily fluid identification
5. Digital evidence: expanding definitions of and incorporating in Project FORESIGHT to examine laboratory resource allocation, efficiencies, and impact of these services from crime laboratory data.

Through regular meetings, the FLN-TWG will promote rich dialogue to outline laboratory needs and the best way forward for adopting new technologies and innovative practices. The group will communicate these insights to the greater forensic community and will continue to encourage collaboration and discussion between researchers and crime laboratory personnel. The NIJ's FTCoE will support the dissemination of FLN-TWG outputs and insights to the community as part of the FTCoE's efforts to support the implementation of new forensic technologies and evidence-based best practices.

### Additional Resources:

[NIJ Supporting Crime Lab Directors and the Formation of the Forensic Laboratory Needs Technology Working Group, May 29, 2018](#)

[NIJ Forensic Laboratory Needs Technology Working Group — Opening a New Channel to Improve Forensics, August 27, 2018.](#)

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