Strengthening Forensic Science in the United States:
A Path Forward

*American Society of Crime Laboratory Directors (ASCLD):*

“Recognizes that the committee’s recommendations pave the way for a significant national focus on the needs of forensic science – a focus that includes policy, scientific and funding improvements. There will undoubtedly be intense discussion and debate with forensic science critics and even those in the profession. However focus must remain on the most important goals: improving standardization and resources.”
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Association of Firearms and Toolmark Examiners (AFTE):

- “AFTE has been working hard to address many of the recommendations even before they appeared in the report.”

- “AFTE was disappointed by the NAS report comments challenging the scientific underpinnings of the firearms and toolmark disciplines, while at the same time choosing to ignore extensive peer reviewed research (dating back over one hundred years), the documentation of which was presented to the committee well in advance of the report being published.”

- But acknowledges that: “Unfortunately, some firearm and toolmark examiners performing casework today are clearly outside the main stream of forensic consciousness and do not conform or adhere to the current protocols and standards recommended by AFTE when conducting such examinations.”
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The International Association for Identification (IAI):

- Generally agrees with most of the recommendations, stating: “We hope that Congress takes advantage of this report and its recommendations by implementing improvements in a manner which guarantees the citizens of this great country, and all those subject to its laws, that evidence which was recovered, examined, and introduced by competent examiners in a judicial proceeding be scientifically sound whereby justice can be served for all.”
Iowa DCI Criminalistics Laboratory:

- Supportive of the report

- Forensic science like all science needs to be ever evolving and improving itself. The focus and resources generated by the report, and any reform that comes from it, will be beneficial in getting us to that next level.

- As an accredited laboratory we feel like we have already addressed, or are now addressing, many of the report findings. However, we realize not all labs and identification units are accredited, and the profession stands to gain by bringing them in line with accreditation requirements.

- Recognize that many of the recommendations will not be easy to accomplish, and we will need assistance with funding and research.
Recommendation 1

Create a National Institute of Forensic Science (NIFS).

The primary recommendation of the NAS report is the creation of an independent, science-based federal agency with strong ties to state and local forensic entities, but not in any way committed to an existing system or part of a law enforcement agency. All subsequent recommendations are tied to this initial provision.

AFFTE:
- “Remains committed to the advancement of the field of firearm and toolmark identification and looks forward to diligently working with whatever entity may eventually become responsible for the forensic enterprise in the United States. The stakes are too high to do anything less.”

DCI Lab:
- An oversight entity is appropriate and necessary to accomplish the goals provided in the report, and facilitate the advancement of forensic science.
Recommendation 2
Establish Standard Terminology

*NIFS should establish standard terminology for laboratory reports and court testimony, looking to ISO 17025 standards for guidance.*

**AFTE:** 1980 – “Established an extensive glossary of terms and definitions covering all phases of firearm and toolmark examinations. This document is periodically revised as necessary, and serves to standardize terminology and statements that can be rendered as conclusions in reports.”

**IAI:** Agrees that standardization of terminology and model reporting of testing results would help eliminate confusion when interpreting examination findings.”

**SWGFAST:** Recommends a collaborative agreement approach to improving the consistency in forensic science nomenclature among SWGs and scientific and legal communities.

**DCI Lab:** Have lab-wide and discipline specific SOPs on reporting, but a nation-wide approach is what is needed to ensure standard terminology is adopted across all of forensic science. Prof. Jay Siegal (IUPUI) is currently in the process of collecting examples of reports to assess current reporting methods and recommend standardized practices.
Recommendation 3
Support Scientific Research on Forensic Practices

*NIFS should competitively fund peer-reviewed research on the accuracy, reliability and validity of forensic science disciplines and quantify the uncertainty of disciplines.*

- General recognition throughout forensic science regarding the need to fund peer-reviewed research for these purposes.

- **AFTE:** Took exception with this finding: “The history of research conducted in the firearm and toolmark disciplines was ignored by the committee.”

- **IAI:** “The IAI has for many years sought support for research that would scientifically validate many of the comparative analyses conducted by its member practitioners. While there is a great deal of empirical evidence to support these exams, independent validation has been lacking.

- **DCI Lab:** Validation studies are regularly conducted on new methodologies, however more work needs to be done in some areas. Public laboratories do not have the resources to conduct this research, however input from forensic science practitioners is important.
Recommendation 4
Ensure Independence of Forensic Labs

*NIFS should allocate incentive grants to ensure that forensic science examinations have independence from (or have autonomy within) the law enforcement community.*

- Generally forensic science is not in support of removing public forensic labs from the administrative control of law enforcement agencies and prosecutor’s offices. Autonomy within the law enforcement community is the preferred option.

- **IAI:** Favors insulation of labs as an option. “We do not feel it is necessarily a question of integrity or external pressure since these issues may arise in any laboratory setting.

- **SWGFAST:** “SWGFAST agrees that forensic laboratories and identification units should have insular funding mechanisms that do not compete with the allocation of primary law enforcement resources. Law Enforcement interests are not the only pressures on the forensic laboratories. The courts have an interest in professional, efficient, and timely operations of the forensic laboratory. Creating a privatized system of testing labs or divorcing labs from their jurisdictional responsibilities could yield an atmosphere of results shopping by investigative agencies.
Recommendation 4
Ensure Independence of Forensic Labs

DCI Lab:

- Not in support of this recommendation.
- Being part of DPS gives the Lab protection on funding in tough times.
- The DCI Lab is a scientific setting, not a law enforcement setting.
- Have been provided autonomy from the rest of DCI to a great degree. (At least we try to act like it!)
- The vast majority of our cases come from agencies other than DCI.
- Results speak for themselves. They not only lead to successful prosecutions, but also to the elimination of suspects.
  - Latent Prints - Far more eliminations than identifications
  - DNA - est. 5-6% of cases a suspect is eliminated. This estimate may be low because:
    - If a source ID is made, elimination statements are not made.
    - Based on cases - Many times there are large numbers of suspects eliminated per case.
Recommendation 5
Research Ways to Minimize Bias

*NIFS should support research programs on human observer bias and sources of human error in forensic examinations.*

- **IAI:** Difficult to quantify, but NIJ and NIST are currently sponsoring a study on the effects of human factors in latent print analysis.

- **SWGFAST:** Agrees that research on the effects of human observer bias may assist in reducing error in forensic examinations. The NIJ/NIST project already underway mirrors this recommendation.

- **DCI Lab:** A good idea. Improve processes by minimizing these sources of error.
Recommendation 6
Set Standards for Forensic Practice

*NIFS should coordinate the National Institute of Standards and Technology (NIST) and the Scientific Working Groups at the FBI in efforts to develop tools for measurement, validation, reliability, information sharing and proficiency testing in forensic science; and also to establish protocols for forensic examinations, methods and practices.*

- General acceptance and support for this recommendation.
- Environmental laboratory example
Recommendation 7
Require Accreditation and Certification

Laboratory accreditation and individual certification of forensic science professionals should be mandatory. NIFS should use standards set by the International Organization for Standardization (ISO) as a reference.

- Professional associations are supportive of both lab accreditation and individual certification.
- Most large public crime laboratories are accredited. If not, they should be. Accreditation of identification units within law enforcement agencies may be behind that of the larger full service public labs. It would be beneficial for them to go through the accreditation process.

ASCLD/LAB Accredited Laboratories
- 385 crime laboratories (as of May 6, 2011)
  - 192 state laboratories, 128 local agency laboratories, 23 federal laboratories, 17 international (outside the United States) laboratories and 25 private.
  - 156 crime laboratories are accredited under the International Testing Program, 5 crime laboratories are accredited under the International Calibration Program, and 224 crime laboratories are accredited under the Legacy Program.
Recommendation 7
Require Accreditation and Certification

- Certification of individual analysts is desirable, but much work needs to be done.
- Many forensic disciplines either do not have a certification program (Trace, Arson, Explosives), or the program isn't specific to the discipline and reflective of the specialization we currently have in the profession (DNA, Drug ID).
- Certification programs typically require a great amount of experience to successfully pass, so not attainable for entry level analysts.
- ? - Expand competency requirements for accreditation (ASCLD/LAB) to provide a temporary solution until deficiencies can be addressed with the current certification offerings.
Recommendation 7
Require Accreditation and Certification

DCI LAB:

- ASCLD/LAB accredited for 11 years
- Many analysts have taken it upon themselves to become certified (if certification is available), including all latent print examiners.
- Providing additional resources in support of training leading to certification.
- More selective in hiring practices (CSI effect)
  - large applicant pools
  - higher education level of new criminalists
  - evolution of forensic science programs
  - require a minimum of a baccalaureate degree in a physical science applicable to the position
  - For some disciplines, we still prefer the core science degree over the forensic science degree.
  - A thorough understanding with respect to scientific method is essential.
Recommendation 8
Quality Assurance and Quality Control

Forensic laboratories should establish routine yet rigorous quality assurance and quality control procedures to ensure the accuracy of all forensic work.

- **IAI**: Agrees and notes that such procedures should be in place in accredited labs.
- **SWGFAST**: “Such procedures are already in place at accredited and non-accredited laboratories. However, the lack of review and compliance enforcement for non-accredited laboratories and forensic units needs to be addressed.”
- **AFTE**: “AFTE endorses the QA/QC requirements of accreditation inspections conducted by ASCLD/LAB as well as guidelines recommended by SWGGUN.
- **DCI Lab**: Has a documented Quality System in conformance with ASCLD/LAB accreditation standards.
- Sound quality systems can be established without accreditation, but going through the process provides valuable insight to the lab and confirmation to stakeholders that the lab meets standards outside of just the lab’s own internal quality system.
Recommendation 9
Code of Ethics

*NIFS should establish a national code of ethics for all forensic science disciplines and should encourage all individual forensic societies to adopt a professional code of ethics.*

- Universal agreement
- Most discipline specific associations (and labs) provide a code of ethics.
- Needs to be mechanisms of encouragement for forensic scientists who commit serious ethical violations
Recommendation 10
Education and Training

Students in the physical and life sciences should be encouraged to pursue graduate studies to improve and develop applicable research methodologies in forensic science through scholarship and grant programs administered by NIFS. Continuing legal education programs for law students, practitioners and judges should also be established and supported.

DCI Lab:
- We’re not seeing that much encouragement is needed.
- A lot of applicants have advanced degrees and have been involved in research.
- Agree that CLE programs could be valuable in preparing court officials to rule on the admissibility of scientific testimony.
Recommendation 11
Medicolegal Death Investigations

The coroner system should be eliminated, and NIFS should be provided with funds to establish a medical examiner system. This system should be supported through funding for forensic pathology education and research, accreditation of medical examiner offices and ensuring that all autopsies are performed or supervised by a board-certified forensic pathologist.

- Forensic science practitioners and associations would be in support.
- In some coroner systems the coroner is a political position that may not have the proper medical school training to be effective.
Recommendation 12
Interoperability of Fingerprint Databases

Congress should authorize the funds needed for NIFS to launch a new effort to achieve nationwide interoperability for fingerprint data (such as Automated Fingerprint Identification Systems).

- **IAI**: Enthusiastically supportive, and in disbelief that interoperability doesn’t already exist.
- **SWGFAST**: Suggests that this body of work is already underway. (AFIS Interoperability Working Group)
Recommendation 13
Homeland Security and Forensics

Congress should provide funding to NIFS to bring the Centers for Disease Control, FBI, forensic scientists and crime scene investigators together for potential roles as first responders in counterterrorism preparedness.

- Universal support
Preliminary Outline of Draft Forensic Reform Legislation – 5/5/10

Oversight and Coordination

• The President shall appoint members to a Forensic Science Commission (FSC) after reviewing recommendations from the National Academy of Sciences and the American Academy of Forensic Sciences. The members of the FSC shall include scientists from a variety of disciplines including the forensic sciences, judges, representatives of the federal and state and local prosecution and law enforcement communities, representatives of the criminal defense community and post-conviction advocates, and other relevant stakeholder communities. A majority of FSC members must have comprehensive scientific backgrounds.

• The FSC shall operate out of the office of the Deputy Attorney General. The FSC shall be staffed by an Office of Forensic Science (OFS), which shall include a Director appointed by the Deputy Attorney General, a Deputy Director appointed by the Director of the National Institute of Standards and Technology and detailed to the OFS, and whatever other staff the FSC deems necessary. The FSC shall also consult regularly with the Directors of the National Science Foundation and the National Institute of Justice and senior officials from other relevant federal agencies.
Oversight and Coordination (continued)

• The OFS shall have the authority to implement recommendations of the FSC. Implementation of scientific recommendations made by the FSC shall be coordinated by the Deputy Director, in consultation with NIST. The FSC and OFS shall have interagency authority.

• The FSC shall determine a list of major forensic disciplines for which there shall be appointed substantive Subcommittees to examine research needs, promulgate standards and best practices, develop certification standards, and other appropriate duties. The FSC shall periodically revisit and update this list. In addition, the FSC shall consider what role, if any, should be played in this process by existing Scientific Working Groups.
Oversight and Coordination (continued)

• The FSC shall consider every field in which courts hear forensic testimony and shall come up with recommendations in any fields for which it determines no subcommittee is necessary. Should the FSC determine that a Subcommittee is not necessary because a field has no scientific basis, the FSC must issue a public statement setting out and explaining this decision. Should the FSC determine that a field can appropriately be covered by a Subcommittee in a related field or is already sufficiently regulated by some other existing entity, it must clearly and publicly set out and explain this conclusion.

• Subcommittees shall be made up of scientists from a variety of scientific disciplines including the forensic sciences, all of whom have knowledge relevant to the individual discipline, though they need not be specialists in that particular discipline.

• The members of each Subcommittee shall be appointed by the FSC’s Deputy Director in consultation with the members of the FSC.

• NIST shall provide support to the Subcommittees and shall perform periodic oversight to ensure that the Subcommittees are performing their duties appropriately. Any problems found by NIST shall be reported back to the FSC.
In addition to the duties set out above with respect to accreditation, certification, research, and standards, the FSC shall, in coordination and consultation with qualified professional organizations, perform or oversee the following functions:

- Determine steps to encourage research collaboration between universities, state and local forensic laboratories, and private laboratories and corporations with appropriate disclosure and safeguards, in order to ensure cost-effective and highly reliable research;
- Determine requirements for education and degree programs in the forensic fields, and encourage the development of more and higher quality academic programs in the forensic fields;
- Determine steps to encourage all jurisdiction to require the comprehensive use of medical examiners and to encourage more well-qualified individuals to become medical examiners;
Oversight and Coordination (continued)

- Examine ways that the forensic sciences can be marshaled toward emergency preparedness, in coordination with the department of Homeland Security;

- Coordinate as appropriate with the National Science Foundation, the Department of Defense, the National Institute of Health, and any other relevant federal agencies, particularly in regard to making efficient and appropriate use of existing research expertise and funding;

- Determine steps to encourage the education and training of law students, attorneys, and judges in forensic science and fundamental scientific principles, including the competent use and evaluation of forensic science evidence;

- Determine effective ways to encourage inter-perability of databases and technologies in all forensic disciplines; and

- Develop a Code of Ethics for the forensic sciences, and determine an appropriate system for encouraging its use and enforcement.
Oversight and Coordination (continued)

- Congress shall authorize $______ annually for the operation and staffing for the FSC and Subcommittees, $______ annually for the operation and staffing of OFS, and $______ annually for NIST for oversight and other duties connected with the Subcommittees.
Research

- The Forensic Science Commission shall develop a comprehensive strategy for increasing and improving peer-reviewed scientific research related to the forensic science disciplines, including research addressing issues of accuracy, reliability, and validity in the various disciplines.

- The Forensic Science Commission, in consultation with the substantive Subcommittees, shall develop a set of priorities for research funding. This list of priorities will be reviewed and re-assessed periodically by the Forensic Science Commission.

- Each of the Subcommittees established by the Forensic Science Commission shall examine the research needs in its applicable forensic science discipline or disciplines, and shall conduct a comprehensive survey of existing research pertaining to each discipline. As part of this survey, each Subcommittee shall identify key areas in which additional research is needed.
Research (continued)

• The Forensic Science Commission and the Director of the Commission shall coordinate with the National Institute of Standards and Technology (NIST) to administer a program to award grants for peer-reviewed research in areas consistent with both the research priorities developed by the Forensic Science Commission and the research needs identified by the Subcommittees.

• NIST shall solicit proposals and competitively award grants for such peer-reviewed research, and shall, to the extent necessary and appropriate, consult and coordinate with the National Science Foundation (NSF) to ensure the integrity of the process for reviewing and funding these proposals.

• The Forensic Science Commission shall coordinate with the National Institute of Justice (NIJ) to solicit proposals and competitively award grants for peer-reviewed research related to the applicability of forensic science to civil and criminal legal systems, in accordance with priorities developed by the Forensic Science Commission. This program shall also encourage research aimed toward increasing the efficiency and effectiveness of forensic testing procedures, including the use of new technologies, and increasing the capacity of forensic testing that may be effectively processed by forensic labs. NIJ shall consult and coordinate with NSF to ensure the integrity of the process for reviewing and funding these proposals.
Research (continued)

- The Forensic Science Commission shall coordinate with the National Institute of Justice (NIJ) to solicit proposals and competitively award grants for peer-reviewed research related to the applicability of forensic science to civil and criminal legal systems, in accordance with priorities developed by the Forensic Science Commission. This program shall also encourage research aimed toward increasing the efficiency and effectiveness of forensic testing procedures, including the use of new technologies, and increasing the capacity of forensic testing that may be effectively processed by forensic labs. NIJ shall consult and coordinate with NSF to ensure the integrity of the process for reviewing and funding these proposals.

- NIST and NIJ shall each submit a report to the FSC annually detailing the application process, grants awarded, and as appropriate status and results of previously awarded grants. The FSC shall evaluate these reports and if appropriate redirect these grant programs in accordance with the FSC’s priorities.

- Congress shall authorize $______ annually for the research grants administered by NIST, and $_______ annually for the research grants administered by NIJ.
Standards/Best Practices

• The Forensic Science Commission shall, in consultation with the Subcommittees and NIST, establish standard protocols, methods, practices, quality assurance standards, and reporting terminology for each applicable forensic science discipline in order to ensure the quality and integrity of the data generated.

• The Subcommittees shall develop standard protocols, methods, practices, quality assurance standards, and reporting terminology for each applicable discipline, and transmit these to the Forensic Science Commission for approval. The Subcommittees shall periodically review these standards and recommend any necessary revisions.

• The Subcommittee in each discipline may alternatively at its discretion delegate to a qualified professional organization the task of determining standards, protocols, methods, practices, and reporting terminology. Should a Subcommittee decide to do so, it must perform regular and thorough oversight and reassess the decision to delegate periodically. The designated professional organization must be open and transparent in its process.

• The FSC shall promulgate and disseminate these standards, and shall develop and oversee a system for enforcing these standards.

• NIJ shall develop and disseminate a manual explaining the standards and best practices, and their use and applicability in the context of the justice system.
Accreditation

- All laboratories that receive federal funds or are funded by an organization that receives federal funding or performs services for the federal government must be accredited.

- The Forensic Science Commission (FSC) will set rigorous standards for accreditation, including educational, proficiency testing, and competency standards for laboratory practitioners, and will reassess these standards periodically. The process for setting and re-assessing these standards must be open and transparent. The FSC will determine what constitutes a laboratory for purposes of accreditation.

- Generally, the FSC will delegate the determining of standards for accreditation to a qualified professional organization. In those instances where this role is delegated, the FSC must perform regular and thorough oversight and reassess the decision to delegate periodically. The designated professional organization must be open and transparent in its process.

- The FSC, or the designated professional organization, will also determine testing, maintenance, and auditing requirements for accredited labs. The FSC will determine a fair fee structure for accreditation, in consultation with the professional organization as appropriate.

- The FSC shall administer the accreditation requirement, or at its discretion oversee the administering of accreditation by a qualified professional organization, shall determine an appropriate enforcement scheme, and shall oversee enforcement. The
Accreditation (continued)

• The FSC shall administer the accreditation requirement, or at its discretion oversee the administering of accreditation by a qualified professional organization, shall determine an appropriate enforcement scheme, and shall oversee enforcement. The FSC or the designated professional organization shall develop and maintain a public list of those laboratories accredited, those denied accreditation, and those whose accreditation has been suspended, limited, or revoked.

Certification

• The Forensic Science Commission will determine which disciplines and which practitioners require certification and will periodically reassess this determination.
• In all laboratories and other entities that receive federal funds, are funded by an organization that receives federal funding, or perform services for the federal government, and in all laboratories wishing to be accredited or re-accredited, all individuals who perform forensic analysis in the disciplines requiring certification must be certified.
Preliminary Outline of Draft Forensic Reform Legislation – 5/5/10

Certification (continued)

• The Subcommittees in each discipline will determine the standards for certification, in coordination with the FSC and those professional organizations to which the FSC delegates responsibility for setting accreditation standards. The FSC and Subcommittees shall reassess these certification standards periodically. The standards and the process for determining them must be open and transparent. The substantive Subcommittees will also determine the parameters of practitioners in their disciplines who must be certified.

• Where a Subcommittee determines that one or more qualified professional certifying organizations exist for a particular discipline, the Subcommittees will generally delegate the determining of standards for certification to those organizations. Should a Subcommittee decide to do so, it must perform regular and thorough oversight and reassess the decision to delegate periodically. The designated professional organization must be open and transparent in its process.

• The certification requirement will be implemented over time, giving current practitioners several years, as determined by the Subcommittee in each discipline, to become certified and giving laboratories several years to come into compliance. The FSC shall determine a deadline by which the certification requirements in all covered disciplines must be implemented.

• The FSC will determine a process for current practitioners to test in to certification, or become certified in a gradual multi-part process, with waiver of some or all degree and training requirements. The FSC will determine a process for new practitioners which requires education and training as part of the certification process. The FSC and Subcommittees will determine a fair fee structure for certification, in consultation with qualified professional organizations as appropriate.
Preliminary Outline of Draft Forensic Reform Legislation – 5/5/10

Certification (continued)

• The FSC shall administer certification, or at its discretion oversee the administering of certification by qualified professional organizations in particular disciplines, shall determine an appropriate enforcement scheme, and shall oversee enforcement.

• NIJ shall administer a grant program and provide technical assistance to assist laboratories and other entities through the transition of continuing work while certifying personnel and seeking accreditation and to help them pay fees for the accreditation and certification process, as well as to assist qualified professional organizations in administering the certification and accreditation processes. Congress shall authorize $ ____ to NIJ for this grant program and technical assistance.

• The FSC shall consider whether and in what form a new federal rule of evidence or procedure would be appropriate requiring that all those who testify in federal court as forensic experts be certified. The FSC must consider how any such rule would be implemented in a way that guarantees access by defense counsel to certified experts. The FSC shall also consider whether any other changes to the federal rules would be appropriate.