STRENGTHENING FORENSIC SCIENCE IN THE UNITED STATES: A PATH FORWARD

Statement of

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and

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National Research Council
The National Academies

before the

Subcommittee on Technology and Innovation
Committee on Science and Technology
U.S. House of Representatives

March 10, 2009

Good morning, Mr. Chairman and members of the Committee. My name is Pete Marone. I am Director of the Commonwealth of Virginia's Department of Forensic Sciences and a member of the Committee on Identifying the Needs of the Forensic Science Community of the National Research Council. The Research Council is the operating arm of the National Academy of Sciences, National Academy of Engineering, and the Institute of Medicine of the National Academies, chartered by Congress in 1863 to advise the government on matters of science and technology. Our study was sponsored by the National Institute of Justice at the request of the Senate Appropriations Committee.

This study, as you know, was requested by Congress at the urging of the Crime Lab Community itself. The charge was (1) assess the present and future resource needs of the forensic science community, to include State and local crime labs, medical examiners, and coroners; (2) make recommendations for maximizing the use of forensic technologies and techniques to solve crimes, investigate deaths, and protect the public; (3) identify potential scientific advances that may assist law enforcement in using forensic technologies and techniques to protect the public; (4) make recommendations for programs that will increase the number of qualified forensic scientists and medical examiners available to work in public crime laboratories; (5) disseminate best practices and guidelines concerning the collection and analysis of forensic evidence to help ensure quality and consistency in the use of forensic technologies and techniques to solve crimes, investigate deaths, and protect the public; (6) examine the role of the forensic community in the homeland security mission; (7) [examine the] interoperability of Automated Fingerprint Information Systems; and (8) examine additional issues pertaining to forensic science as determined by the Committee. The reason the

community asked for this study was due to the fact that the focus of the federal government has been on the single discipline of DNA. The community, including myself, knew that the other disciplines and the state of our system needed to have further resources and assistance from the federal government. In my testimony today I will simplify, due to time, our report—*Strengthening Forensic Science in the United States: A Path Forward*—into the scientific and technical challenges that must be met in order for the forensic science enterprise in the United States to operate to its full potential. Specifically, I will discuss them in four classes of resources, research, standardization, and education, as these are the primary challenges at this time. The report found that some of this work has already been begun by forensic scientists, but that additional effort and coordination are needed to carry it through.

The first element of the charge, while not specifically addressed in the form of a recommendation, led to a clear committee understanding that in general, "for the state and local laboratories there has been a lack of resources (money, staff, training, and equipment) necessary to promote and maintain strong forensic science laboratory systems." As I know you are acutely aware, the States are in a fiscal crisis. As a State Crime Lab Director I know that this has in fact been the situation for some time. As such, the State and local Crime Labs and the Medical Examiner community have not been receiving the funds they need, but the case load has been increasing exponentially. Further, the funding from the Federal government has been focused overwhelmingly on the discipline of DNA, which is not our largest caseload. The Congress has consistently put some funding in for the other disciplines but it falls far short of what is necessary. I want to make it clear, Mr. Chairman, that this is at the root of many of our issues and,

speaking as an individual, I am asking Congress to please put funding in at an adequate level for all of forensic science, not just a single discipline.

Under the category of research, the committee determined that some of the forensic science disciplines need further research to provide what the scientific community commonly uses as the proper underlying validation for some of the methods in common use and to provide the basis for more precise statements about their reliability and precision. Because a method has not been sufficiently validated does not make it invalid. In order to accomplish this, we need more funding for research and a stronger, broader research base. The disciplines based on biological or chemical analysis, such as toxicology, drug analysis, and some trace evidence subdisciplines such as explosives, fire debris, polymers to include paint and fiber analysis, are generally well validated and should not be included in the same category as the more experience-based disciplines, such as fingerprints, firearms and toolmarks, and other pattern-recognition types of analysis. There are variations within this latter group; for example, there is more available research and protocols for fingerprint analysis than for bitemarks. We need studies, for instance, that look at large populations of fingerprints and toolmarks so as to quantify how many sources might share similar features. In addition to investigating the limits of the techniques themselves, research is also needed on the effects of context and examiner bias.

In the realm of standardization and education our report raised concerns about the lack of mandatory requirements for professional certification and for laboratory accreditation and the variability in the way forensic science results are reported in courts. I think it is critical to first understand that most in the forensic science community have

already begun to move in the direction of accreditation; in fact the recently published *Census of Publicly Funded Crime Laboratories, 2005* stated that by 2005, 82% of the public laboratories were accredited. That number is even higher today. But more can be done. Our report calls for certification that is based on written examinations, supervised practice, proficiency testing, and adherence to a code of professional practice. The report explicitly calls for the National Institute of Standards and Technology, NIST, in collaboration with the proposed National Institute of Forensic Science (NIFS) to be involved in setting standards for certification and accreditation and in developing protocols and best practices for forensic analysis, using existing programs as a basis. Assisting laboratories which have not yet been accredited is a lengthy process. Each policy and method must be reviewed to determine if it is in compliance and, if not, what must be done to bring it into compliance. This process can take a few years. That is not to say that the work done by the laboratory is suspect during the process, but that the standards and criteria are quite specific.

Our report's primary conclusion is that the forensic science enterprise does not have a unified plan and needs strong, fresh national direction. Strong leadership is needed to adopt and promote an aggressive, long-term agenda to strengthen forensic science. Our report strongly urges Congress to establish a new, independent National Institute of Forensic Science to lead research efforts, establish and enforce standards for forensic science professionals and laboratories, and oversee education standards. Our committee carefully considered whether such a governing body could be established within an existing agency, and determined that it could not. While we recognize the

difficulty with this task, we believe that the root of the struggles this community has is the lack of federal support and guidance.

However, while we were impressed with the technical abilities of three NIST staffers who briefed our committee, and in fact had a NIST scientist as a member of our committee, we concluded that NIST does not have expertise in enough of the essential areas to play the governance role that forensic science needs. First, while NIST has a strong reputation in some aspects of forensic science, it would not be seen by that community as a natural leader. In large part that is because the context in which forensic science operates is unique. For example, forensic science must make the most of whatever evidence has been collected, a situation that is not always amenable to prescriptive standards. And the recommended new federal entity must be sensitive to the interplay between forensic sciences and the criminal justice system, which is unfamiliar territory for NIST. Our report calls on the new entity to lead an effort to remove public forensic laboratories from the administrative control of law enforcement agencies or prosecutors' offices or be autonomous within such agencies. That is likely to be a difficult task, one that requires knowledge of relationships among those operations and between federal, state, and local jurisdictions. It is a challenge to which NIST is not well suited.

As I already indicated, a key recommendation of our report is to build up the research base and educational infrastructure that will enable forensic science to move forward. NIST does not have much experience in establishing and running an extramural research program, and its ability to stimulate new academic forensic programs and strengthen existing ones is untested. Another key requirement is to strengthen the

practices of forensic science. While NIST has great expertise in establishing laboratory standards, it has not previously taken on a task similar to what is required for forensic science: establishing a coherent set of standards for laboratory practice, reporting, and professionalism (including codes of ethics), along with standards and practices for laboratory accreditation and professional certification and incentives for their widespread adoption.

NIST does not have expertise in, and influence over, the medicolegal death investigation system, nor expertise in the issues that need to be addressed to strengthen that system, a critical recommendation in our report.

However, the strongest reason for establishing a new independent entity is that it could then be established according to the vision laid out in our report. If a new institute is established as an arm of some existing entity, that entity will tend to design it according to its own existing knowledge and experience, with whatever bureaucracy or biases that entails. As an example of this very issue, a draft copy of a white paper from NIST, provided to me by the staff of this Committee regarding the establishment of a National Institute of Forensic Science within NIST, lists a number of actions it proposes to answer the recommendations of the NAS report. However, what was not addressed at all in that proposal was how the existing accreditation programs (both for laboratories and forensic science undergraduate and graduate education programs), programs for certification of individuals, and the technical protocols (although not mandatory) that are already in place through the various scientific working groups (SWGs) and in use by many laboratories, would serve as a basis for and be incorporated into the plan. There

also was no indication as to how laboratories would be supported in their efforts to meet these standards.

Mr. Chairman and Members of the Committee, I thank you for the opportunity to come before you today. I'd like to conclude by quoting a part of our study which I believe is one of the most important statements and findings we had:

"Numerous professionals in the forensic science community and the medical examiner system have worked for years to achieve excellence in their fields, aiming to follow high ethical norms, develop sound professional standards, ensure accurate results in their practices, and improve the processes by which accuracy is determined. Although the work of these dedicated professionals has resulted in significant progress in the forensic science disciplines in recent decades, major challenges still face the forensic science community."

Again, thank you for your attention, and I will be pleased to answer questions.

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February 19, 2009

Yesterday the National Academy of Sciences (NAS) released the long-awaited report of the Committee titled *Identifying the Needs of the Forensic Science Community*. That report contains numerous items of interest to members of the International Association for Identification (IAI). There has not been adequate time to fully evaluate the entire 254 page report but based on preliminary reviews, below are some points that might be considered if members are queried regarding the report:

- The Consortium of Forensic Science Organizations (CFSO) (website: www.thecfso.org) of which the IAI is a member was largely responsible for convincing Congress of the need for this committee. We thank Congress and the National Academies for their hard work over the past several years to produce this report and call attention to the needs of the nation's forensic community.

- The IAI has over the years supported the need for this kind of study. During the course of the NAS hearings the IAI was invited to present its positions concerning these issues. With the release of this report, the IAI stands ready to support many of the committee's recommendations and work with the necessary parties to achieve those goals.

- The IAI endorses continuing research in pattern evidence to include fingerprint evidence. In fact that was recognized in the final paragraph of the IAI's Standardization Committee's report in 1973 that called for additional research to be conducted to provide continuing scientific support to fingerprint identification

- Over the years a number of research projects have been conducted. None of those projects refuted the scientific principle that fingerprints are unique and permanent.

- There is no research to suggest that properly trained and professionally guided examiners cannot reliably identify whole or partial fingerprint impressions to the person from whom they originated.

- The IAI endorses accreditation of forensic service providers as well as certification of examiners in their respective disciplines. To that end the IAI put in place its first certification program 32 years ago and to date has added certification programs in six additional disciplines.

- Members who may have to testify about friction ridge identifications are reminded that the admissibility of their testimony rests with the presiding judge. Challenges to the underlying science and practice are handled in Daubert/Frye type hearings and should not affect direct testimony in the trial proper.

- It is suggested that members not assert 100% infallibility (zero error rate) when addressing the reliability of fingerprint comparisons.

- Although the IAI does not, at this time, endorse the use of probabilistic models when stating conclusions of identification, members are advised to avoid stating their conclusions in absolute terms when dealing with population issues.

- The IAI will be asking its science and practice committees to review the NAS report over the next few weeks and will provide the membership with additional guidance in the future.

- The Executive Summary of the report is available at: www.nas.edu at no cost. The entire report is available from the same website at a cost of $33.00.

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