180-Day Study Report:

Status and Needs
of
United States Crime Laboratories

Prepared by:

American Society
of
Crime Laboratory Directors

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PREFACE

This report was prepared by the American Society of Crime Laboratory Directors (ASCLD) for the National Institute of Justice (NIJ) as part of a 180-Day Study Report of the status and needs of crime laboratories in the United States.

The ASCLD is a non-profit professional organization of crime laboratory directors dedicated to the highest quality of forensic services. The ASCLD promotes:

"Excellence in Forensic Science Management"

The ASCLD:

- Provides leadership in the forensic science community
- Provides training and information to members
- Promotes quality in the practice of the forensic sciences

Now in its thirty-second year, the ASCLD has 550 members representing 245 local, state, federal and private crime laboratories in the United States. Membership also includes directors from 30 international laboratories, as well as national and international academic affiliates. Additional information on the ASCLD may be obtained at its web site (www.ASCLD.org) or by contacting the ASCLD at:

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SUMMARY

State and local crime laboratories are an integral part of the criminal justice system. The demand for testing has increased for crime laboratory analyses, but funding has not kept pace with this increasing demand. Crime laboratory backlogs cause significant delays in evidence being analyzed, resulting in delays in the courts as well as in the investigation of crimes. The largest 50 laboratories in the U.S. ended the year 2002 with an increase of 134% in their backlogs. Overall, for every four requests completed by the laboratory, one request remained unworked by the end of the year. Approximately 80% of the backlogged requests were attributable to controlled substances, latent prints and DNA. Backlogs were also seen in firearms/toolmarks, toxicology, pre-DNA and trace.

The primary need identified by crime laboratory managers is personnel. Personnel were needed in all sections. Additional personnel needed to achieve a 30-day turnaround time for all requests was estimated in excess of $36 million. Other needs, to include equipment (estimated in excess of $18 million), supplies, laboratory space, overtime, travel and training, were also identified. Reliable information is needed by laboratory directors when making management decisions. A regular census of crime laboratories is needed to produce that data.

Prior to conducting analysis on evidence, forensic scientists require both basic scientific education and discipline-specific training. Minimum curricula guidelines for both undergraduate and graduate forensic science programs have been established and an accreditation program has been established to accredit them. Support for forensic science programs should be comparable to other natural science programs, to include support for graduate research. Training needs for forensic laboratories are significant, driven by the increased demand for trained staff and succession planning. Initial training of laboratory analysts is largely on-the-job and is labor intensive. There are some recommendations of the content of training programs, but these do not exist for all disciplines. Training is also required on a continuing basis to maintain and update knowledge and skills. Collaborations, innovative approaches, and alternative delivery systems for forensic analyst and manager training are needed. Regional centers based on established programs would be suited for expanded training.

Maintaining and increasing professionalism within the forensic science community requires attention to a wide range of issues. Many are related to quality and guidelines of good practice. Laboratory accreditation is not a guarantee against error, but it is a program which requires a laboratory to evaluate it operations and address issues. Personnel resources (1.5 full time equivalents) are needed for participation in accreditation programs. There is also

a time commitment and substantial fees and expenses associated with a laboratory's participation in an accreditation program. The average cost per analyst for proficiency testing is $500 per year. The average fee per accreditation inspection by the largest forensic laboratory accrediting body in the U.S. is $6,500, exclusive of travel costs. Peer certification programs have an impact on a profession. Certification programs have been established in the forensic community. Certification, however, comes with a price which includes not only the initial cost of application and testing, but the academic degree(s) and continuing education requirements necessary for participation. Also, an important aspect of these programs is monitoring the quality and consistency of the boards that provide credentials. This is being addressed by the forensic community.

As applied research, work in the forensic sciences does not receive the type or level of funding that basic research receives. Few forensic laboratories (20%) have resources dedicated to research and, historically, research is performed at universities. Practitioner partnerships are needed for these research programs. In addition to research into new techniques and the implementation of these techniques in the laboratory, crime labs must also identify innovative ways work more efficiently and rapidly to reduce case backlogs and to bring forensic science to the crime scene. Crime laboratories barely have the resources to attend to core business and must direct resources to casework. Any innovation that does take place is largely uncoordinated. The NIJ provides the primary research funding for the forensic sciences. There is also funding provided to federal laboratories for research. Technology transfer of new technology into the crime laboratory requires validation and establishment of staff competency. The NIJ's Forensic Research Network is one example of a partnership to bridge the gap between universities and crime laboratories to promote technology transfer. To keep up with changing technology scientific guides of best practice are needed. The development of these guides has been primarily accomplished in the U.S. by the Scientific Working Groups (SWGs). These SWGs are primarily funded by a federal laboratory and are, therefore, subject to the funding and management decisions of that agency. A strong vetting process and an effective formal association between the SWGs and the forensic community (via the ASCLD) are needed.

With approximately 400 diverse forensic laboratories located in all 50 states, crime laboratories have a critical need for a mechanism to collectively communicate training, quality, and policy issues. The American Society of Crime Laboratory Directors is the primary organization representing the management of state and local crime laboratories in the U.S. The ASCLD provides the forensic community and crime laboratories with a mechanism improvement.

The ASCLD founded both the accreditation program (ASCLD/LAB) and the National Forensic Science Technology Center (NFSTC), two independent agencies providing essential services for the crime laboratories in the U.S. The future development of the ASCLD, to include possible staff, requires continued support.

In the event of biological, chemical or radiological attack in the U.S., crime laboratory personnel may be put at risk for exposure to harmful agents. Laboratory personnel need information about such hazards to ensure their safety. State and local crime laboratory officials must build relationships with their federal counterparts as well as state and local homeland security officials prior to an attack.

Federal laboratories collaborate with state and local forensic laboratories in many ways. They provide leadership and resources for research, training, and technology transfer. The FBI maintains and supports on-line databases for linking evidence such as firearms (NIBIN), fingerprints (IAFIS), and DNA (CODIS). Decisions are made by the federal laboratory on the support to be offered based on budgets, staff and space availability. A formal mechanism, such as an advisory board is needed between the ASCLD and federal laboratories.

INTRODUCTION

State and local crime laboratories analyze evidence for both investigative and judicial purposes. These laboratories are an integral part of the criminal justice system. In the past 35 years, crime laboratories have evolved from a collection of fewer than 100 state and local agencies scattered in various jurisdictions around the country to today's array of approximately 400 sophisticated scientific operations. Reliance on scientific evidence has grown, stimulated by rapid growth in laboratory technology and the demand for the use of evidence. Studies dating from 1972 document the utilization of physical evidence in the administration of criminal justice.

The vast majority of the evidence analyzed in criminal cases in this country is analyzed in a state or local crime laboratory. In most jurisdictions, the demand for testing has increased for crime laboratory analyses, but funding has not kept pace with this increasing demand. For example, between 1990 and 2000, the average United States (U.S.) crime laboratory experienced an increase in caseload of 23%. During that same period, budgets grew by only 10% and staff size by only 9%. For all this rapid growth in forensic technology, crime laboratories are still the "B" team of the criminal justice system. While investigators are seen as essential to the criminal justice system, the crime laboratory is often thought of as second-line support with limited and uncertain funding.

The crime laboratory consists of separate analytical sections. These analytical sections are often referred to as disciplines within the laboratory. Each of the disciplines concentrates on different evidence types and has specific personnel, training, equipment, and facility requirements.

- The drug chemist analyzes materials for the presence of controlled substances such as cocaine, heroin and marijuana, as well as a wide range of prescription drugs. Products from clandestine laboratories, such as methamphetamine, are also analyzed by the controlled substances section. Many laboratories use sophisticated instrumentation for the analysis of drugs. These instruments are expensive to purchase and have an effective lifetime of approximately five years. Training for this position can take up to one year.

- The toxicology section analyzes biological specimens (primarily blood and urine) for the presence of alcohol and/or drugs in cases involving driving under the influence (DUI). Coroner's cases may also be analyzed in the laboratory to assist with the determination of cause of death. Much of the same type of instrumentation used in the controlled substances section is used in the toxicology section. Unfortunately, the analytical parameters for the analysis of drugs from body fluids are sufficiently different from the

solid dosage forms analyzed in the controlled substances section which prevents the use of the same equipment for both types of analyses. Training for this section often requires one year.

- The trace evidence section examines a wide variety of evidence not elsewhere analyzed. It may include microscopic examinations of hairs and fibers or glass, or it may involve analyzing accelerants from a suspected arson scene. This section uses a wide range of expensive equipment. Training for individuals working in this section may be in excess of two years due to the wide range of materials encountered.

- Latent prints are fingerprints that are not visible until some type of processing, often chemical, is performed. Lasers are also often used in this visualization process. Comparisons are performed by analysts trained for up to two years. An Automated Fingerprint Identification System, known as AFIS, is used to conduct computer-assisted searches against a known database.

- The forensic biology or pre-DNA biology section includes locating stains and identifying body fluids (e.g., blood, semen, or saliva). Chemical and microscopic methods are used. Training for the forensic biology section can require up to six months and when combined with DNA testing can require up to two years.

- The firearms/tool marks section involves evidence associated with firearms. When a weapon is fired, marks are left on shell casings and projectiles by the weapon. The examination of these marks allows the examiner to associate weapons, casings and projectiles. There is also a firearms database, the National Integrated Ballistic Identification Network (NIBIN), which can be used to facilitate the association of casings, hopefully to a weapon and ultimately to a person. Training for firearms examiners is also lengthy, in excess of two years in many cases.

- The questioned documents section conducts handwriting analysis, and examines documents and its components (e.g., paper, ink). It also includes obliterated writing. Work in this section is labor intensive and training is lengthy, up to three years.

- Additional specialty areas including computer forensics and crime scene processing are also part of many crime laboratories.

Differences exist among the crime laboratories in the United States. There are a number of factors that contribute to these differences. For example:

- Laws differ in each state and crime laboratories adjust their procedures to answer legal questions. For example, if a court requires the percentage of

a controlled substance in a confiscated sample to be reported, quantitation procedures are included in analysis protocols.

- There are different types of evidence used in the courts and the criminal justice system. Each of these evidence types has different analytical and laboratory needs.

- All laboratories do not offer the same services nor do they perform the same analyses.

As of May 2004, there were 256 laboratories accredited by the American Society of Crime Laboratory Directors/Laboratory Accreditation Board (ASCLD/LAB). (Note: ASCLD/LAB defines a laboratory as any site or location, with at least one full-time scientist who examines evidence in criminal matters and provides opinion testimony with respect to such evidence in a court of law.) Of these accredited laboratories, 20 are federal agencies, 164 are state agencies, 62 are local or regional agencies, and 10 are university or private laboratories. These laboratories analyze evidence in nine disciplines including controlled substances, toxicology, trace evidence, forensic biology/DNA, firearms/toolmarks, questioned documents, and latent prints. Eighty-six percent of the laboratories accredited have sections which analyze for controlled substances; 60% have firearms/toolmarks sections, 57% have sections which analyze trace evidence, 42% have forensic biology/DNA sections, and 51% have latent print sections. The full list of accreditation by discipline is listed in Table 1.

Table 1: Disciplines Accredited by ASCLD/LAB
(May 2004)

Accredited Discipline	Number of Laboratories Accredited in Discipline	Percent of Accredited Laboratories in Discipline
Controlled Substances	220	86
Toxicology Includes laboratories analyzing only blood alcohol along with those analyzing a variety of samples.	128	50
Trace Includes any laboratory doing analysis in any of the areas of fire debris, hairs, fibers, glass, filaments, etc.	145	57
Biology Includes any laboratory doing analysis in either serology or DNA	107	42
Firearms/toolmarks	153	60
Questioned Documents	57	22
Latent Prints	130	51
Crime Scene Includes laboratories responding to violent crimes and/or clandestine laboratories.	12	4
Digital Evidence Includes laboratories analyzing evidence in computer, audio, or visual mediums.	2	< 1

EQUIPMENT AND MANPOWER NEEDS

Introduction:

The operational needs of a laboratory include equipment and manpower. These needs are a function of the types of services (analytical disciplines) provided by the laboratory.

Since the mid-1970s, the American Society of Crime Laboratory Directors has gathered resource information from its members, including information on backlogs. In 1997, a survey, conducted by the ASCLD with Aspen Systems (and funded by the National Institute of Standards and Technology), identified crime laboratories and their operating characteristics. In March 2001, the ASCLD conducted an electronic staffing/workload poll of its members. Most recently, the ASCLD has put its survey efforts into a census of crime laboratories and is being conducted with funding provided by the Bureau of Justice Statistics (BJS). The goal of the census is to establish baseline information of workload, resources and needs of the forensic crime laboratories in the United States. The census is being conducted using a survey that queries laboratory directors regarding the forensic analyses they conduct, their budgets, workload demands, operations, and professional standards. The survey project is a collaboration of four organizations: the University of Illinois at Chicago (UIC) Center for Research in Law and Justice, the UIC Criminal Justice Department, the UIC Survey Research Laboratory, and the ASCLD. An advisory committee of ASCLD members assisted UIC staff members in creating the survey instrument and also assisted by identifying crime laboratories to receive the survey.

The survey encompasses the common disciplines provided by the majority of municipal, county and state labs including latent prints, questioned documents, firearms, crime scene, explosives and fire debris, postmortem toxicology and drivers under the influence (DUI) testing, forensic biology and DNA, trace (transfer), and controlled substances. Survey categories include:

- The Laboratory's Organization (type and functions performed)
- Budget
- Staff (number of employees and their salaries)
- Workload (demands and capabilities)
- Outsourcing (use of private laboratories)
- Quality Assurance, Research and Training (accreditation, proficiency testing, research and training)

Although not yet published, BJS provided census information from the 50 largest crime laboratories in the United States. The selection of these laboratories was based on the number of personnel working in the laboratory, defined as full-time equivalents (FTEs).

Overview:

At the current time, approximately 280 crime laboratories have been included in the 2002 census. Data for the 50 largest state and local laboratories was used for this review of needs. These laboratories represent approximately half of the total requests submitted to U.S. crime laboratories.

The 50 largest crime laboratories in the U.S. employed more than 4,300 full-time equivalent (FTE) personnel. The total operating budgets from these 50 laboratories, excluding personnel, exceeded $266 million. These laboratories received more than 994,000 new cases in calendar year 2002, including over 1.2 million requests for forensic services. A case is evidence from an investigation. A request is a request for a specific type of analysis (e.g., controlled substances, latent prints, etc.). Evidence from one investigation (case) may contain items for analysis in multiple sections, i.e., multiple requests.

Backlogs:

When the demand for service outstrips a laboratory's capacity to analyze the submitted evidence, a backlog is created. Crime laboratory backlogs cause significant delays in the courts as well as in the investigation of crimes. To address backlog issues, crime laboratory work is prioritized according to court dates. In some cases, evidence is not even brought into the laboratory by police agencies. Many laboratories establish case acceptance policies to limit the number of cases coming into the laboratory. Sometimes the laboratory may return evidence if it cannot be analyzed in a timely manner.

The largest 50 laboratories in the U.S. started the year 2002 with about 115,000 backlogged requests. They received an additional 1.2 million requests and completed approximately 1.1 million requests. The estimated year-end backlog was approximately 270,000 requests, an increase 134%. Overall, for every four requests completed by the laboratory, one request remained unworked by the end of the year. For the purpose of the census, a backlog was defined as any request which remained unanalyzed in the laboratory for more than 30 days. Turnaround time (TAT) was defined as the time between the submission of a request to the laboratory and when the report is issued.

The backlog problems in the laboratories are not unique to evidence type. Backlogs in all sections are created when evidence in that section is submitted to the laboratory faster than it can be analyzed. For the 50 largest laboratories,

approximately 80% of the 270,000 backlogged requests were attributable to the three disciplines listed in Tables 2 and 3.

- For controlled substances, 448,000 requests were completed in 2002 by the 50 largest laboratories. There were 135,000 requests (23% of the requests submitted to that section) backlogged at year end. For every three requests completed, one was added or outstanding by year end.

- For latent prints, 102,000 requests were completed in 2002 by the 50 largest laboratories. There were 48,600 requests (32% of the requests submitted to that section) backlogged at year end. For every two requests completed, one was added or outstanding by year end.

- For DNA analysis, 19,000 requests were completed in 2002 by the 50 largest laboratories. There were 31,000 requests (62% of the requests submitted to that section) backlogged at year end. For every request completed, 1.6 was added or outstanding by year end.

Table 2: Backlogs for Selected Disciplines

Section	% of Total Backlog	% of Total Laboratory Requests
Controlled Substances	50	49
Latent Prints	18	13
DNA	11	4

In addition to the disciplines listed in Table 2, backlogs were also seen in the other sections of the laboratory to include:

- Firearms/toolmarks section (16,000 requests)
- Toxicology (15,000 requests)
- Pre-DNA biology (9,000 requests)
- Trace (6,000 requests)

Staffing:

The primary need identified by crime laboratory managers is personnel. This need was identified in all sections. During the three-year period from 1997 to 2000, the 50 largest laboratories reported an average increase in personnel of one FTE. During this same period, there was a 33% increase in the number of FTEs working in the DNA section. Note: Approximately 94% of the 50 largest laboratories performed DNA analysis, but only an estimated 55% of the total 280 crime laboratories surveyed reported performing DNA analysis. ASCLD/LAB

reports 42% of accredited laboratories conduct either DNA analysis, biology analysis, or both.

The largest 50 laboratories estimated that approximately 930 additional FTEs would be needed to achieve a 30-day turnaround time for all 2002 requests. The estimated cost for these additional personnel is in excess of $36 million (based on starting salaries and not including benefits). The personnel estimates for controlled substances, DNA and latent prints are summarized below and in Table 3.

- For controlled substances, laboratory directors expected examiners to handle 840 requests per year (actual was approximately 846). An additional 100 FTEs would be needed to reduce the backlog to 30 days. This represents approximately 10% of the personnel needs identified. The total cost for these FTEs exceeds $3.6 million (salaries only).

- For latent prints, laboratory directors expected examiners to handle 213 requests per year (actual was approximately 236). An additional 160 FTEs would be needed to reduce the backlog to 30 days. This represents approximately 17% of the personnel needs identified. The total cost for these FTEs exceeds $6.7 million (salaries only).

- For DNA, laboratory directors expected examiners to handle 69 requests per year (actual was approximately 54). An additional 230 FTEs would be needed to reduce the backlog to 30 days. This represents approximately 25% of the personnel needs identified. The total cost for these FTEs exceeds $9.3 million (salaries only).

Table 3: FTEs Needed for 30-Day Turnaround Time (TAT)

Section	Backlog	% of Discipline Backlogged	FTEs Needed for 30-Day TAT	% of Total FTEs Needed
Controlled Substances	135,000	23	100	11
Latent Prints	48,600	32	160	17
DNA	31,000	62	230	25

Table 3 contains data from the largest 50 U.S. laboratories. Preliminary data from 224 laboratories participating in the 2003 census of publicly funded laboratories demonstrates that personnel needs to achieve a 30-day turnaround time are significant throughout all sections in the laboratory. The percent increase in staff needed to eliminate the backlog is summarized by laboratory section in Table 4.

Table 4: Personnel Needs

Section	% Staff Increase by Section
Firearms	40
Trace	41
Latent Prints	40
Controlled Substances	26
Toxicology	26
Questioned Documents	38
Computer Crime	60
Crime Scene	15
Biology Screen	50
DNA	68

Other Needs:

The largest 50 U.S. crime laboratories identified other needs to include the following:

- Equipment
- Supplies
- Laboratory space
- Overtime
- Travel
- Training

The equipment needs were estimated by the 50 largest laboratories to be in excess of $18 million. The costs for typical equipment needed for several laboratory sections are summarized in Table 4.

Table 5: Typical Equipment Needs

Section	Estimated Cost
Controlled Substances	$454,000
Trace	750,000
Firearms	74,350
Questioned Documents	90,000
Latent Prints (without laser)	116,625
Toxicology	153,800
Arson	200,500

Laboratory directors also identified needs for laboratory space. These needs vary with the scientific disciplines, equipment, and instrumentation used in the laboratory. In the document, *Forensic Laboratories: Handbook for Facility Planning, Design, Construction, and Moving*, staff needs and functional processes are identified as the driving factors for laboratory design. Yet, many current crime laboratories were not built as laboratories but were converted from existing buildings. They were built or remodeled before many of the new technologies used by the laboratory were implemented. Staffing levels have also increased without a commensurate increase in laboratory space. The ratio of 92.90 m^2 (1000 ft^2) per staff member is recommended.

Periodic Assessment of Crime Laboratories:

Laboratory directors have a responsibility to the public to develop and maintain efficient, high quality forensic laboratories. Laboratory managers must make decisions about the services their laboratories should offer. They are also responsible for developing sound scientific practices. They need reliable information to ensure they keep pace with technology improvements and to make budget decisions to cover costs for new laboratory equipment and training.

Reliable information is needed by laboratory directors when making these decisions, but limited information is available. The American Society of Crime Laboratory Directors (ASCLD) has collected information from their membership with a periodic management survey. Their studies included operational characteristics of laboratories, staffing levels and workload data. Other studies, such as the Bureau of Justice Statistics (BJS) Survey of DNA Crime Laboratories (1998 and 2001) and the FBI's CODIS Survey of DNA Laboratories have also been conducted, but those studies were primarily focused on laboratories performing DNA analyses. One of the most recent studies (2003) also focused on DNA. That study revealed that DNA laboratories are overworked, understaffed, and insufficiently funded. Personnel issues were significant and funding for additional staff and increased salaries was recommended to avoid loss of skilled personnel. Similar studies are needed for the full range of laboratory services.

The Bureau of Justice Statistics, Office of Justice Programs, Department of Justice (BJS) is funding the first census of publicly-funded forensic crime laboratories to collect information on laboratories on a national level. The goal of the current BJS survey, as described in the previous section, is to provide baseline statistical information on the operation and workload of public for crime laboratories in order to improve understanding of the level of work performed and the resources needed. Once that baseline is established, regular updates of that data are needed.

EDUCATION AND TRAINING

Introduction:

Prior to conducting analysis on evidence, forensic scientists require both basic scientific education and discipline-specific training. To be in compliance with widely-accepted accreditation standards, scientists in each of the disciplines must have, at a minimum, a baccalaureate degree in a natural science, forensic science, or a closely-related field. Each examiner must also have successfully completed a competency test (usually after a training period) prior to assuming independent casework. Education and training are also needed to maintain expertise and to keep up with advances and changes in technology.

Forensic Science Education:

The forensic community must work with our nation's educational institutions to ensure that scientists employed by crime laboratories have the education necessary to understand their scientific responsibilities, to provide a high-quality work product and are able to communicate their findings effectively.

The Council on Forensic Science Education (COFSE) recognized a recent marked increase in the number of forensic science programs at colleges and universities. They note that many forensic educational programs have been established with very limited resources, insufficient personnel, laboratory space, and support. Students completing these programs expect to find employment in crime laboratories but are often surprised to learn that laboratory managers are not satisfied with their educational credentials. Crime laboratory directors generally expect applicants to have degrees in a natural science with a preference for degrees in chemistry or molecular biology. This is particularly important for work in the forensic disciplines of controlled substance identification, arson analysis, trace analysis and DNA (and pre-DNA) testing.

An assessment of forensic science needs published in 1999 by the NIJ, describes the educational and training needs of the forensic science community. That report included recommendations to establish national standards and an accreditation system for forensic science educational programs. In 2001, the American Academy of Forensic Sciences (AAFS), and the ASCLD encouraged the NIJ to establish a technical working group to address forensic science education and training. As a result, the NIJ established the Technical Working Group on Education, or TWGED, that same year to recommend guidelines for forensic science education.

The TWGED report, *Education and Training in Forensic Science: A Guide for Forensic Science Laboratories, Educational Institutions, and Students,* provides minimum curricula guidelines for both undergraduate and graduate forensic science programs. The TWGED identified the field of forensic science as an

applied, multidisciplinary profession based on the natural sciences, noting it was essential that students studying forensic science have education and training consistent with this scientific foundation.

The TWGED recommends that academic forensic science programs establish a working relationship with forensic science laboratories. Practicing forensic scientists as adjunct faculty bring their practical knowledge to the university program and courses, ensuring that the applied portion of the curriculum is adequately addressed. Close relationships between a forensic laboratory and a university often result in internships for students that benefit both the student and their mentor. The partnership between academic institutions and practitioners also provides opportunities for collaborative research, allowing the practitioner and the university mutual benefit in their research initiatives. The NIJ has a history of including a practitioner in forensic science research grant evaluations and NIJ also sponsors symposia where practitioners and researchers are brought together. Practitioners benefit from ongoing exposure to research methodology while the research community benefits from the examiners' pragmatic view of laboratory needs. The forensic community needs to explore ways to increase collaborations with academia.

The TWGED strongly recommended that forensic science educational programs seek accreditation, but noted that there was no mechanism in place for the accreditation of these programs. The American Academy of Forensic Sciences, the American Society of Crime Laboratory Directors, and the Council of Forensic Science Educators, recommended the establishment of a formal accreditation process for forensic science educational programs. In 2002, the AAFS established an ad hoc committee, the Forensic Educational Programs Accreditation Commission or FEPAC. The FEPAC mission was to establish a program for formal evaluation and recognition of college-level academic programs based on the TWGED guidelines.

With financial assistance from the AAFS and the NIJ, the FEPAC (now a standing committee of the AAFS) has established standards, policies, and procedures to accredit university forensic science programs. The program includes a self-study completed by the university applying for accreditation as well as an on-site assessment by trained FEPAC assessors. In 2003, a pilot test of the FEPAC accreditation program resulted in the accreditation of forensic programs at five colleges/universities: Cedar Crest College (Allentown, Pennsylvania), Eastern Kentucky University (Richmond, Kentucky), Florida International University (Miami, Florida), Metropolitan State College of Denver (Denver, Colorado), and Michigan State University (East Lansing, Michigan). Pilot testing of this program continues in 2004.

AAFS and the NIJ provided financial assistance for pilot accreditations. As a result, costs for these accreditations are reduced during the pilot stage of this program. Continued support for the FEPAC is needed. This support will assist

the community by keeping the costs of the program affordable for universities and colleges wishing to seek recognition for their programs. Funding will also assist with widening the scope of the FEPAC program. Currently, the FEPAC is focused on university programs with traditional delivery systems. The program should be expanded to consider less traditional program delivery mechanisms to include distance learning.

The FEPAC is working to establish its program as a reliable evaluation process for the quality of forensic science education. The FEPAC program is designed to comply with the U.S. Secretary of Education's Criteria for Recognition and the FEPAC hopes to seek recognition from the U.S. Department of Education (USDE). In order to be eligible for recognition from the USDE, however, FEPAC, via its status as standing committee of the AAFS, must establish a "federal link." Recognition of FEPAC accreditation as a condition of receiving federal funds from NIJ would establish such a link. NIJ should consider providing assistance to AAFS to foster FEPAC recognition in establishing that link once there has been sufficient time for universities to participate in the FEPAC program.

The TWGED recognized that significant additional funding is necessary to bolster existing forensic science programs. The TWGED guidelines recommend that institutional support for forensic science programs be comparable to other natural science programs. There is no sustainable source of funding at the state or federal level, however, to support graduate education in forensic science. The NIJ has traditionally supported graduate programs by providing research funding for the forensic sciences but additional funding from alternative sources is essential. A program to eliminate or forgive student loans for those graduates who obtain full time employment in public forensic science institutions would be one such alternative source and should be considered. In addition to research and student support, funding is also needed for the acquisition and maintenance of equipment, for major research instrumentation, and for laboratory renovation. Institutions offering forensic science programs need to provide for the ongoing costs associated with that laboratory component. Existing forensic science programs that are under-supported must be upgraded and new programs should not be created if the proper facilities and operational budget are not available. The typical cost for the research component for a master’s degree thesis, a requirement to meet FEPAC accreditation standards, is between $15,000 and $20,000 per student. This is in addition to other tuition and educational costs each student will incur. Preference for funding university forensic science programs and students should be linked to FEPAC accreditation.

Forensic Science Training:

Training needs for forensic laboratories are significant, driven by the increased demand for trained staff and succession planning. In *Forensic Sciences: Review of Status and Needs* (1999), training was identified as one of the four major areas of need within the forensic science community. The assessment of training needs for the forensic community provided in that report is still valid. More recently, the National Institution of Justice's TWGED addressed training and continuing education in forensic sciences in a report released in 2002.

When a new analyst or examiner is hired, usually a recent university graduate, that individual requires initial training to build competency. The length of the initial training provided to an analyst depends upon the laboratory specialty area the trainee will enter. For example, controlled substance analysts may require only six to twelve months of training. Those training in experience-based disciplines such as latent prints examinations, firearms and toolmarks analyses, and questioned documents examinations may require up to three years of training before being released to perform independent casework. During their training period, individuals in experience-based disciplines serve much like an apprentice to a senior examiner.

Initial training remains largely on-the-job and is labor intensive. Most initial training contains theoretical and practical elements, and the laboratory must identify a trainer with appropriate experience and expertise to conduct the training. Often, this is an individual with significant casework experience whose casework productivity is reduced or lost to the laboratory during the training period. Laboratory accreditation standards require the training to be documented. Standards also require the training to contain a demonstration of competency prior to assuming casework responsibilities. After the formal period of training is complete, the trainer closely monitors the newly-trained individual's casework, typically for a period of months. Some peer groups, such as the Scientific Working Group on Analysis of Seized Drugs, SWGDRUG, and the Scientific Working Group on DNA Analysis Methods, SWGDAM, provide recommendations on the content of training programs, as well as entry-level academic requirements. But these do not exist for all disciplines, and those that do are not uniform. In response to this, the TWGED provided an outline of criteria and implementation approaches for initial training. These criteria were developed to be used as a guide for the crafting training programs, providing a common framework across disciplines, helping to ensure that programs are consistent and contain essential elements. The ASCLD has recognized the need to provide a mechanism to evaluate forensic training and is working to develop model evaluation programs. Such programs could lead to an accreditation process for forensic training programs if funding were identified to support such an effort.

There are some visiting-scientist and intern programs available that can be utilized to augment or abbreviate initial on-site training, but costs are high and funding remains scarce. Some laboratories (e.g., the state laboratories in Illinois and Virginia) have begun collaborations with universities to offer their initial training programs to students enrolled in the university's graduate program. For example, through the Residency Program, qualified students in the University of Illinois at Chicago (UIC) receive the same initial training provided to employees of the Illinois State Police, with the exception of supervised casework. In such a program, the agency providing the training does not pay a salary to the individual during the training, although Virginia does pay some stipends, lowering the cost of training considerably and greatly reducing the training burden on experienced examiners.

There have been attempts by some crime laboratories to collaborate on initial training, sending the individuals to be trained to a single site. The Illinois State Police has accepted individuals from other states/laboratories into their training programs when space exists. The National Forensic Science Technology Center (NFSTC) has developed an Academy Program as part of its cooperative agreement with the National Institute of Justice (NIJ). NFSTC Academies typically run for 16 weeks and provide intensive programs of study for new recruits to crime laboratories. Thus far, NFSTC has designed and presented Drug Chemistry and DNA Analysis Academies. An Academy in Forensic Firearms Examination is currently under development for Spring 2004 implementation. After the pilot testing of an Academy program, the NFSTC will no longer offer the training as part of its cooperative agreement. It will make the curricula available to the community for use in their laboratories.

For an analyst in a one-year training program, the cost of just the salary paid to the individual in training is estimated at $30,000 to $40,000 per year. The actual cost to train a person for one year is even greater as the trainer’s productivity is diminished.

Training is also required on a continuing basis for qualified analysts to maintain and update their knowledge and skills in new technology, equipment, and methods. Continuing professional development is often referred to as on-going or in-service training. This type of training may include both theoretical and practical components. Almost all scientific and technical working groups (e.g., SWGs and TWGs), certification programs (e.g., American Board of Criminalistics, or ABC, the International Association for Identification, or IAI), and accreditation programs (e.g., ASCLD/LAB) recommend or require continuing professional development training but the requirements vary by discipline. As with initial training, the TWGED provided an outline of criteria for continuing professional training to be used as a guide to provide a common framework to ensure that programs contain essential elements. The ASCLD’s effort to develop a model evaluation program for training includes continuing professional development

programs. Funding and support for the development of such a program would be essential.

Symposia, workshops and short courses are offered on a number of topics by a wide array of service providers to include professional societies and associations, the Forensic Resource Network (FRN), and federal (e.g., FBI, DEA) and state laboratories. Agencies often pay travel costs of $1,000 or more, per person.

Assistance has been provided to the crime laboratory community through a variety of programs, to include the FRN and grant programs from the NIJ. These programs have been invaluable to the community, providing resources and training to address issues ranging from quality systems, training models, accreditation and certification.

The cost of continuing professional development varies, depending on the requirements of the specialty. For example, SWGDRUG recommends a minimum of 20 contact hours per year for each analyst. The FBI's *Quality Assurance Standards for Forensic DNA Testing Laboratories* specifies one day of continuing professional development per year. The ASCLD/LAB accreditation program has adopted this latter requirement for DNA analysts. The TWGED recommended that between 1% and 3% of the total forensic science laboratory budget be allocated for training and continuing professional development. The largest 50 laboratories reported this was actually less than ½ of 1% of their total budgets. In lieu of time requirements or a percentage, some agencies specify a budget amount for each analyst per year. Considering the funds support travel and fees, $1,000 to $1,500 per analyst per year is typical. For a laboratory with 25 analysts, the annual cost of continuing professional development (based on $1,000 per analyst) would be an estimated $25,000.

In addition to technical training (either initial or continuing), analysts need professional training in a wide range of topics to include: ethics, courtroom testimony, quality assurance and safety. Some agencies (e.g., Illinois State Police and Virginia Division of Forensic Sciences) include this type of training as part of agency training programs. Professional organizations such as the American Academy of Forensic Sciences (AAFS) and regional forensic science societies, such as the Midwestern Association of Forensic Sciences (MAFS) and the Southern Association of Forensic Sciences (SAFS) also offer training opportunities that may include presentations or workshops on these topics. Travel costs (estimated at $1,000 per person) comprise a large portion of the costs for these programs.

Supervisors and managers are often educated in the sciences but need instruction in basic supervision skills, fiscal procedures, and project management. The *Forensic Sciences: Review of Status and Needs* contained a recommendation that the ASCLD should intensify its effort to provide appropriate training for managers and supervisors. Until 2001, the FBI and the ASCLD jointly

hosted an annual management symposium that was attended by approximately 300 laboratory directors and managers. In 2002 and 2003, the FBI and the ASCLD offered separate independent symposia. The attendance at each of these symposia was in excess of 350 managers and supervisors, demonstrating the previously unmet need for manager training. The cost to attend the FBI symposium was primarily the costs of transportation to the meeting (estimated at $350/per attendee), with the on-site expenses paid by the FBI. Funding for the ASCLD symposium was provided by the NFSTC in cooperation with the NIJ. The cost to attend the ASCLD symposium was approximately $1,225 per person. Through the cooperative agreement, that cost was reduced by approximately $400 for attendees who received a housing allowance provided by NFSTC. In 2004, another FRN participant, West Virginia University, will sponsor the ASCLD symposium through its cooperative agreement with NIJ. In 2004, the FBI will again sponsor a separate training symposium for laboratory managers.

The *Forensic Sciences: Review of Status and Needs* contained recommendations to develop alternate delivery systems for forensic science training. Electronic media are increasingly being used to meet that need. In April 2003, the FBI announced the FBI Virtual Academy, offering web-based access to training. Additionally, the FBI is attempting to establish training partners to work together to standardize key curricula, using the TWGED document as a guide. The NFSTC is in the process of developing and testing a CD-based Quality Documents program that is being recommended for use in the ASCLD Accreditation Mentoring Program. Distance learning is also being developed for forensic science training. For example, several states including the Illinois State Police use video conferencing in conjunction with on-site facilitators to allow its training coordinators to deliver training to multiple sites simultaneously. In this way, the number of trainees may exceed the capacity of a single site or, small numbers of trainees may receive a standardized training presentation.

Certain types of training, however, require face-to-face participation and evaluation. For these types of training, regionally-based programs would reduce travel costs. Illinois, Virginia, New York, Florida and California have operational laboratories/systems with well-developed training programs that also have strong collaborations with universities. Such established programs are ideally suited for expansion to provide training on a regional basis, if sufficient funding were provided.

PROFESSIONALISM AND ACCREDITATION STANDARDS

Introduction:

Maintaining and increasing professionalism within the forensic science community requires attention to a wide range of issues. Many are related, either directly or indirectly, to quality and guides of best practice. Professionalism includes quality assurance measures such as accreditation and certification. It also includes the activities of professional organizations that provide quality services and work to establish scientific guides of best practice upon which the quality assurance measures are based. Research, innovation and technology transfer are also elements of professionalism in forensic practices.

Crime Laboratory Accreditation:

While crime laboratory accreditation is not a guarantee against errors, it is a program which requires laboratories to have and follow written policies to monitor quality. Accreditation requires a laboratory to evaluate its operations and if problems are identified, they must be addressed. The largest accreditation program for crime laboratories in the U.S. is the American Society of Crime Laboratory Directors/Laboratory Accreditation Board (ASCLD/LAB) program. This program is currently in the process of establishing compliance with the International Organization for Standards (ISO). The National Forensic Science Technology Center (NFSTC) through its FQS-I subsidiary offers an ISO compliant program for accrediting forensic laboratories.

Presently, there are 260 crime laboratories accredited by ASCLD/LAB. At least three states have mandated the accreditation of their crime laboratories: New York, Texas, and Oklahoma. There are nine states in the U.S., however, that do not have any accredited laboratories within their boundaries. These are Kentucky, Wyoming, North Dakota, South Dakota, Delaware, Rhode Island, Montana, Arkansas, and New Hampshire. At this time, Arkansas and New Hampshire have begun the process of having their state laboratories accredited by ASCLD/LAB and the process should be completed during this calendar year.

The laboratories accredited by ASCLD/LAB are “classical” crime laboratories. A classical crime laboratory is a single laboratory or system composed mainly of scientists analyzing evidence in at least two of the following disciplines: controlled substances, trace, biology, toxicology, latent prints, questioned documents, firearms/toolmarks, or crime scene. A non-classical crime laboratory is a site or laboratory providing analysis in one or more of the disciplines of digital evidence, latent prints, questioned documents, and crime scene, with the workforce composed mainly of sworn personnel who may not have scientific training. These sites are often referred to as identification units.

If the definition of a crime laboratory is expanded to include identification units operating in the 14,000 police departments and law enforcement agencies in the U.S., there could be at least 1,000 crime laboratories. The actual total is unknown. The average size of classical laboratories is 30 personnel (25 of whom would be considered analysts). The average size of the non-classical crime laboratory is estimated to be three (all three would be considered examiners).

The ASCLD has established a formal mentoring program to assist its members in achieving accreditation by pairing a laboratory director from a non-accredited laboratory with one from an accredited laboratory. Participants in this program report the greatest impediments to accredited are related to resources; both the personnel needed to work on the accreditation standards and the cost of the program itself.

- Personnel resources are need for participation in accreditation programs. For example, it is estimated that approximately 1.5 FTEs are devoted to preparing for accreditation for at least one year prior to a first-time inspection. Quality assurance (QA) personnel are tasked with writing and implementing standard operating procedures, auditing existing practices, and compiling necessary documentation and background related to personnel, management operations, and the physical facility.

- There is also a time commitment for individual scientists at accredited laboratories. They must meet proficiency testing and record keeping requirements in all disciplines in which they analyze evidence. Satisfactory completion of at least one proficiency test per discipline annually is the accreditation standard. Most proficiency tests are developed by private companies and sold to crime laboratories. The average cost per analyst for proficiency testing during one year is approximately $500. Laboratories seeking accreditation must show one year of satisfactorily completed proficiency tests prior to the time of the initial inspection. Once accreditation is achieved, analysts must continue to maintain proficiency throughout the multi-year accreditation cycle.

- There are substantial fees and inspection expenses associated with a laboratory's participation in an accreditation program. An inspection team audits the laboratory only after submission of all required paperwork and following consultation between the laboratory and lead assessor. The size of the laboratory and the number of disciplines in the laboratory dictate the size of the inspection team and the time on site. All expenditures associated with the assessment process are borne by the laboratory. The average cost per accreditation inspection for the ASCLD/LAB program is approximately $6,500. The fees for the NFSTC program include: an application fee ($1,000), an assessment fee ($2,900 - $3,900)

and an additional fee per discipline ($1,000). The NFSTC fees do not include travel, lodging, or per diem.

- In order to properly prepare a laboratory for an accreditation inspection and ensure a high likelihood for success, QA personnel need training in the auditing process. An existing mentoring process, supported in part by the ASCLD and the FBI, allows QA and management personnel to participate in hands-on study with a laboratory that is already accredited, but this requires travel and resource expenditures that most non-accredited laboratories do not have.

There is an increasing emphasis being placed on accreditation and meeting quality assurance standards for crime laboratory operations, but for many laboratories, the needed funds are not available to carry the process to completion. Many laboratories now face stagnant budgets and rising caseloads. Increasingly, accreditation is viewed as a required credential for crime laboratories. External funding to meet this need may be required, as well.

Peer Certification:

In a survey of 229 certification programs in 2003, the American National Standards Institute (ANSI) found that certification programs have a significant impact on a profession. That same study found the benefits of certification include enhanced credibility of certificants. Benefits also include the enhancement of professional development and training, as well as enhancement of academic training for the profession. Certification programs are expensive to develop and administer. Additionally, certification programs require substantial time and financial commitment by individuals participating in the programs.

Historically, some effort has been made to define standards for forensic practitioners in the form of certification. Certification within the forensic community is a voluntary process of peer review by which an individual practitioner is recognized as having attained the professional qualifications necessary to practice in one or more disciplines. The Forensic Science Foundation (FSF) was awarded a grant from the National Institute of Justice (NIJ) to start forensic science certifying boards as a means to identify whether practitioners met defined standards. In 1980, the FSF issued its final report, “Forensic Science Certification Program.” Although that project resulted in the formation of six forensic boards conferring credentials, no oversight board was formed.

Additional certification programs have been established by other organizations in the forensic community. In 1977, the International Association for Identification (IAI) initiated the first certification program for the latent print discipline. They now offer certifications in bloodstain pattern analysis, crime scene, footwear, forensic art, forensic photography, and ten-print fingerprints, as well as latent

prints. In 1989, individuals who recognized a need for certifying forensic scientists working in crime laboratories incorporated the American Board of Criminalistics (ABC). The effort was then taken on by five of the regional forensic science organizations who became charter members of the ABC: the California Association of Criminalists (CAC), the Mid-Atlantic Association of Forensic Scientists (MAAFS), the Midwestern Association of Forensic Scientists (MAFS), the Northeastern Association of Forensic Scientists (NEAFS), and the Southern Association of Forensic Scientists (SAFS). The NIJ subsequently supported an American Board of Criminalistics (ABC) project to develop specialty examinations in five areas. The ABC has awarded approximately 300 certificates in Criminalistics and almost 100 in the specialty disciplines of forensic biology, molecular biology, drug chemistry, fire debris analysis, and trace evidence.

The forensic community supports the concept of certification. In a 1992 report, the National Research Council's Committee on DNA Technology in Forensic Science endorsed the concept of certification for DNA analysts. The ASCLD, in its "Guidelines for Forensic Laboratory Management Practices" (1994), recommended that laboratory managers support peer certification programs that promote professionalism and provide objective standards. In 2002, the Technical Working Group on Forensic Science Education recommended certification of an individual’s competency by an independent peer-based organization, if available, from a certifying body with appropriate credentials. Certification, however, comes with a price. In addition to the initial cost of application and testing, the academic degree(s) and continuing education requirements necessary for certification are substantial when considering a large number of examiners. These expenses will have a significant effect on laboratory budgets that are currently inadequate to meet the primary demands of casework.

There are a number of forensic certifying boards. The American Academy of Forensic Sciences (AAFS) acknowledges the certification status awarded by seven of these certifying boards in its membership directory. As the number of certifying boards has increased, the AAFS considered developing criteria to use in determining whether to acknowledge certification by a particular board. During the review of this issue, AAFS recognized that an important aspect of professional oversight is monitoring the quality and consistency of the boards that provide credentials to forensic specialists. This was not addressed originally by the Forensic Science Foundation's final report on certification.

In a 1995 report, the Strategic Planning Committee of the AAFS reported that quality and standards for certification varied widely among the different forensic boards. That committee recommended the AAFS establish a formal mechanism to assess the different processes used by the various boards to grant credentials. The AAFS Professional Oversight Committee began work on this in 1996 that was continued later by the AAFS mini-Task Force on Criteria for Specialist Certifying Boards. The Accreditation and Certification Task Force was ultimately charged by the AAFS with providing an objective way of assessing, recognizing,

and monitoring the various boards. In June 2000, this task force was incorporated as the Forensic Specialties Accreditation Board (FSAB).

The FSAB, with support from the AAFS and grant assistance from the National Forensic Science Technology Center (through its cooperative agreement with NIJ), has worked to develop standards and a voluntary program to assess, recognize, and monitor the forensic specialty certifying boards. An important aspect of this process was the use of international standard (ISO) and standards from other recognized accreditation bodies.

Ultimately, the FSAB was determined to develop a program specifically for forensic specialties. Forensic certifying boards were invited to participate in the FSAB if they met established requirements including periodic re-certification, an examination covering the knowledge base of the relevant forensic specialty, a process for providing credentials, and a code of ethics. Nine organizations representing the majority of the recognized boards offering forensic specialty certification were invited to join FSAB. These include the American Board of Criminalistics (ABC), the American Board of Forensic Document Examiners (ABFDE), the American Board of Forensic Odontology (ABFO), the American Board of Forensic Toxicology (ABFT), the American Board of Medicolegal Death Investigators (ABMDI), the Association of Forensic Document Examiners (AFDE), the Forensic Toxicologist Certification Board (FTCB), the International Association for Identification (IAI), and the International Institute for Engineering Sciences (IIES). The FSAB process to establish the accreditation program has been slow but the FSAB is now in the final stages of its pilot accreditation review and expects to offer accreditation to the first successful applicant in 2004.

Support is needed for forensic certification programs and the FSAB. Start-up costs for developing a certification program are considerable. Most programs are started with the expectation that they will become self-sustaining within five years of the first test administration. In reality, only about half of the organizations have achieved self-sustaining status within that period.

Innovation:

Traditionally, basic scientific research is performed at universities. Forensic science, however, is a very specialized applied science. Academic and forensic practitioner partnerships can bring the skills and strengths of both basic and applied science to a research program. Such partnerships exist within the forensic community where a strong forensic laboratory works closely with a well-established, graduate-level university forensic program. This model has been found to be effective both within and outside the United States.

Few forensic laboratories (20%) have resources dedicated to research. Research in forensic science is focused primarily on how technology can be

applied to forensic evidence. As applied research, work in the forensic sciences does not receive the type or level of funding that basic research receives.

In addition to implementing new techniques in the laboratory, forensic science laboratories must identify innovative ways of working more efficiently and rapidly to reduce case backlogs and to bring forensic science to the crime scene. In its December 2001 report, *"The Advancement of Science for Justice,"* the Australian National Institute of Forensic Science (NIFS) reports that forensic science barely has the resources to attend to core business and must direct resources to casework. It further states that any innovation that does take place is largely uncoordinated on a national level. This report could have been written to describe forensic science innovation in the United States.

The NIJ provides the primary research funding for the forensic sciences. This includes the development and evaluation of new and existing forensic technologies and methods. There is also funding provided to federal laboratories for research which benefits the state and local laboratories. In 2001, the Federal Bureau of Investigation received an increase in funding for its research efforts. In January 2003, the FBI announced its research partnership program in the on-line journal Forensic Science Communications. The FBI has used this program to establish partnerships with state and local forensic laboratories to enhance the development and transfer of new forensic technologies and facilitate the development of national forensic databases. The FBI sets priorities for this program. Although no formal advisory group is used, input is solicited from the forensic community on research topics via the FBI's Annual Symposium on Crime Laboratory Development and its websites. State and local laboratories are also provided opportunities to collaborate with the FBI on these projects.

Successful transfer of new technology into the crime laboratory requires both the internal laboratory validation of the technique and the establishment of staff competency with the new technique. The laboratory must demonstrate the method is analytically sound and provide training to staff prior to implementation. This internal validation process can require months or even years to complete, and requires examiners to be redirected from casework to conduct the necessary validation studies. The ability to demonstrate that required internal validation studies have been completed is an essential part of any laboratory accreditation program.

The Forensic Resource Network (FRN), a program of the National Institute of Justice, is one example of a partnership among research institutes, technology centers and crime laboratories that promotes the implementation of new technologies and model training programs for the forensic laboratory community. They bridge the gap between universities and operational laboratories. The network consists of the Marshall University Forensic Science Center at Huntington, WV, the National Center for Forensic Science at Orlando, FL, the National Forensic Science Technology Center at Largo, FL and the West Virginia

Forensic Science Initiative at Morgantown, WV. Network members provide training for laboratory personnel, technology transfer services, methods research and development, methods testing and evaluation services, and analytical services for laboratory casework outsourcing. The ASCLD serves as advisor to the FRN, providing feedback and guidance for their project proposals.

Scientific Guides for Best Practice:

To keep up with changing technology, the forensic community has a continuing need to develop scientific guides of best practice. The development of these guides for best practice has been primarily accomplished in the U.S. by Scientific Working Groups (SWGs). These SWGs are groups of forensic scientists with discipline-specific expertise**.** Most are funded by a federal laboratory and are, therefore, subject to the funding and management decisions of that agency. They meet at least annually to consider technical and quality-related issues.

These technical working groups serve a very real and valuable role in the forensic community. They work to develop analytical guidelines, training and educational recommendations, and quality assurance guidelines. The recommendations of these groups can be expected to have a significant impact on other certification and accreditation standards, was well as the courts. A strong vetting process is needed for the guidelines developed by these working groups to make them truly representative of the entire forensic community.

The SWGs could also address another need for the crime laboratory managers. The Senior Managers of Australia and New Zealand Forensic Laboratories (SMANZFL) and the European Network of Forensic Science Institutes (ENFSI) have technical working groups established which can be called upon to provide technical assistance for policy decisions being made by those organizations. The ASCLD and the forensic community would benefit from an effective, formal association with technical working groups.

Leadership:

With approximately 300 diverse forensic laboratories located in all 50 states within the U.S., crime laboratories have a critical need for community leadership and a mechanism to collectively address training, quality, and policy issues. The American Society of Crime Laboratory Directors is the primary organization representing the management of operational state and local crime laboratories in the U.S. State and local laboratories benefit from the leadership provided by the ASCLD, which serves as a forum for laboratory managers to discuss and address relevant quality and policy issues. Support for the ASCLD provides the forensic community and crime laboratories with a mechanism for the improvement of the crime laboratories in the U.S. The ASCLD founded both the accreditation program (ASCLD/LAB) and the National Forensic Science Technology Center (NFSTC), two independent agencies providing essential

services for the crime laboratories in the U.S. Strong ties still exist with both those agencies.

The FBI sponsored the ASCLD from its origins in 1973 until 2001, a span of 29 years. Although no longer sponsoring the ASCLD, the FBI continues to serve ex-officio on the ASCLD Board of Directors. In 2002, the ASCLD received sponsorship from the NFSTC through its cooperative agreement with the NIJ. This assisted the ASCLD in making the transition from FBI support. Beginning 2004, the ASCLD is receiving support from WVU through its cooperative agreement with the NIJ. In 2004, the ASCLD established its first contract for administrative support in response to the increasing needs of its membership. The future development of the ASCLD, to include possible staff, needs continued support.

Safety:

In the event of biological, chemical or radiological attack in the U.S., crime laboratory personnel may be put at risk for exposure to harmful agents. Few, if any, state and local crime laboratories are equipped to analyze biological, chemical or radiological agents, such as would be seen from Weapons of Mass Destruction (WMD), yet these same state and local crime laboratories may receive such samples as submitted evidence, many times before their true hazardous nature is known. Laboratory personnel need information about such hazards to ensure their safety. State and local crime laboratory officials must build relationships with their federal counterparts as well as state and local homeland security officials prior to an attack.

Conversely, state and local health laboratories equipped to test biological, chemical or radiological agents may benefit from the expertise of state and local crime laboratories in evidence handling procedures. Crime laboratories are skilled at proper evidence packaging, sealing, documentation and storage. Public health laboratories that do not routinely process evidence would benefit from interactions with crime laboratories. In addition to sharing expertise on proper evidence handling, crime laboratories could also share expertise to ensure that latent print, DNA and trace evidence is preserved in samples containing WMD agents.

COLLABORATION BETWEEN FEDERAL LABORATORIES AND STATE AND LOCAL LABORATORIES

Introduction:

Federal crime laboratories collaborate with state and local forensic laboratories in many ways. Some examples include:

- Federal laboratories provide leadership and resources for research, training, technology transfer and enhanced capabilities.
- The FBI provides on-site training as well as training via their Virtual Academy, an on-line training system. Training is provided to examiners of all disciplines as well as laboratory managers.
- The FBI participates in research partnerships with state and local laboratories and they have conducted a variety of validation projects which have benefited the forensic community, including the large-scale DNA validation described earlier.
- Federal laboratories fund the vast majority of the Scientific Working Groups (SWGs).
- The FBI maintains and supports on-line databases for linking firearms evidence (NIBIN), fingerprints (IAFIS) and DNA (CODIS).
- The FBI is establishing regional mitochondrial DNA laboratories that will be located in existing state laboratories.
- The crime laboratories of other federal law enforcement agencies, including the Drug Enforcement Administration, the Bureau of Alcohol, Tobacco, Firearms and Explosives, and the Secret Service to provide leadership, research, training and other direct support to state and local crime labs, as well.

Advisory Boards:

Federal laboratories provide a great deal of support for state and local crime laboratories. Decisions are made by the federal laboratory on the support to be offered based on budgets, staff expertise and availability, and space availability. A formal mechanism, such as advisory boards or focus groups, if established, would facilitate communication and feedback between federal laboratories and the forensic community concerning the needs and the priorities of the state and local laboratories. The ASCLD, as the representative of the forensic community, would be an idea body to fill such an advisory role.

Casework:

State and local crime laboratories conduct some testing for federal agencies. A limited sampling of eight state laboratories and one local laboratory, however, revealed less than 1% of the evidence received is submitted by a federal agency.

The FBI Laboratory accepts casework from state and local crime laboratories in certain circumstances; e.g., when the state or local laboratory does not have the analytical capabilities to conduct the required analysis. The FBI would have additional information on the number of these types of cases accepted each year.

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