



State of Arizona
Office
of the
Auditor General

PERFORMANCE AUDIT

**DEPARTMENT
OF
PUBLIC SAFETY**

**SCIENTIFIC ANALYSIS
BUREAU**

Report to the Arizona Legislature
By Debra K. Davenport
Auditor General

**September 2000
Report No. 00-12**

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DEBRA K. DAVENPORT, CPA
AUDITOR GENERAL

STATE OF ARIZONA
OFFICE OF THE
AUDITOR GENERAL

September 7, 2000

Members of the Legislature

The Honorable Jane Dee Hull, Governor

Colonel Dennis A. Garrett, Director
Department of Public Safety

Transmitted herewith is a report of the Auditor General, A Performance Audit of the Department of Public Safety's Scientific Analysis Bureau. This report is in response to a June 16, 1999, resolution of the Joint Legislative Audit Committee. The performance audit was conducted as part of the Sunset review set forth in A.R.S. §41-2951 et seq. I am also transmitting with this report a copy of the Report Highlights for this audit to provide a quick summary for your convenience.

This is the second in a series of reports to be issued on the Department of Public Safety.

As outlined in its response, the Department agrees with all of the findings and recommendations.

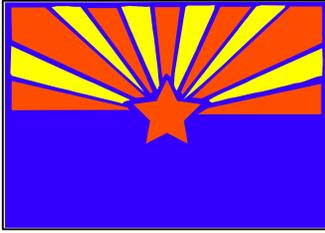
My staff and I will be pleased to discuss or clarify items in the report.

This report will be released to the public on September 8, 2000.

Sincerely,

Debbie Davenport
Auditor General

Enclosure

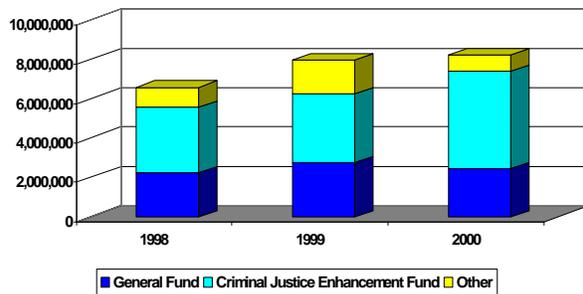


Program Fact Sheet

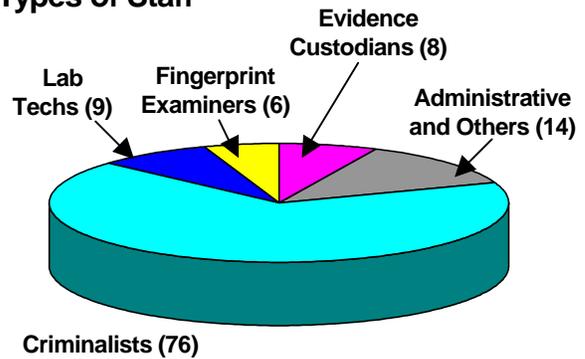
**Department of Public Safety
Scientific Analysis Bureau
(Crime Lab)**

Services: The crime lab offers the following services: **1) scientific analyses**—criminalists perform a wide range of scientific techniques on submitted evidence; **2) court testimony**—criminalists testify in court regarding the analysis he/she performed; **3) officer training**—crime lab staff instruct officers in proper identification, collection, and packaging of evidence; and **4) crime scene assistance**—crime lab staff help officers locate latent prints, examine fire scenes for arson, and gather evidence at clandestine drug lab scenes.

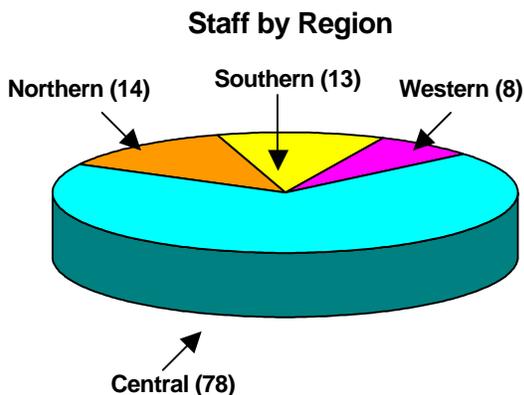
Program Revenue: \$8,240,000
(Estimated for Fiscal Year 2000)



Types of Staff



Personnel: 113 (Fiscal Year 2000)



Facilities: 4



Both the Phoenix and Tucson labs are state owned. The Flagstaff lab is leased at an annual cost of approximately \$160,000. The Lake Havasu City lab is housed in a city building at no cost.

Equipment: \$3 million including:



- 11 Gas-chromatography mass spectrometers (GCMS)—used in identifying controlled substances. Current GCMS cost can range from \$78,000 to \$92,000.



- 6 DNA genetic analyzers, each costing \$55,000 to \$67,000.



- 6 Fourier Transform Infrared Spectrophotometers (FTIR) for controlled substances and trace evidence testing. Each FTIR can cost from \$25,000 to \$80,000.



- 1 Scanning Electron Microscope-Energy Dispersive Xray (SEM-EDX) used in the analysis of trace evidence through magnification. The unit costs \$250,000.

Lab equipment has an approximate five-year life span.

Crime Lab Goals: (Fiscal Year 2000-2001)

1. To improve the Arizona criminal justice system's effectiveness and to enhance public safety by continual improvement in delivering essential scientific and technical support services that are provided by the scientific analysis subprogram.
2. To enhance and expand essential scientific and technical support services through new technology, automation, and adequate staffing.
3. To enhance scientific analysis subprogram effectiveness through problem-solving techniques and improve customer contract and communication efforts.
4. To enhance scientific analysis subprogram effectiveness through employees' professional development.
5. To increase public awareness of the integral role that scientific analysis plays in the criminal justice system.

Adequacy of Performance Measures: The crime lab's five goals appear to be aligned with its mission. Its goals include 10 objective and 12 performance measures. A review of the performance measures indicates:

- In general, most of the performance measures do not indicate expected outcomes but focus on inputs and outputs.
- The crime lab does not list any performance measures that identify the quality of its efforts. Quality measures reflect the agency's effectiveness in meeting the expectations of customers and stakeholders, such as customer satisfaction or responsiveness level.

SUMMARY

The Office of the Auditor General has conducted a performance audit of the Department of Public Safety's Scientific Analysis Bureau as part of a Sunset review of the agency. This audit was conducted pursuant to a June 16, 1999, resolution of the Joint Legislative Audit Committee and was conducted under the authority vested in the Auditor General by Arizona Revised Statutes §41-2951 et seq. This is the second of several audits of the Department of Public Safety.

The crime lab serves 277 separate agencies.

The Department of Public Safety's (DPS) Scientific Analysis Bureau (known as the crime lab) was established to provide assistance to Arizona's law enforcement community by analyzing submitted physical evidence related to a crime. The crime lab provides a variety of services free of charge, including scientific analyses of evidence, court testimony of scientific results, officer instruction on proper evidence handling, and officer assistance at crime scenes. Since 1982, Arizona's crime lab has been accredited by the American Society of Crime Laboratory Directors Laboratory Accreditation Board (ASCLD/LAB) and has participated in the accreditation inspection process for more than 50 laboratories, both nationally and internationally.

The crime lab's 113 staff serve a total of 277 separate state, county, municipal, and federal agencies throughout Arizona from its four locations (Flagstaff, Lake Havasu City, Phoenix, and Tucson).

Steps Needed to Expand the DNA Database Program's Crime-Solving Potential (See pages 9 through 23)

Arizona is just beginning to have a DNA database program that can help solve crimes. During the past decade, crime labs across the nation have expanded their role from simply conducting

DNA analyses of identified suspects to developing databases of convicted offenders. These databases help law enforcement identify repeat perpetrators or establish links or patterns among crimes. Some states are beginning to experience success in matching DNA profiles to crime-scene evidence and Arizona has recently experienced its first database matches.

Fewer than 2,000 of 7,623 offender samples have been uploaded to database.

Arizona's limited success is partially due to a backlog of convicted offender samples. For example, fewer than 2,000 (26 percent) of the 7,623 blood samples DPS has received from offenders convicted of specific crimes have been analyzed with up-to-date DNA techniques and uploaded to the database. Another 38 percent (2,885 of 7,623) have undergone the initial analysis but are awaiting necessary quality control reviews before they can be uploaded to the database. The primary factor contributing to the crime lab's significant offender sample backlog is a recent change in forensic DNA analysis methods. Switching to the new method required criminalists of all levels to undergo additional training that temporarily halted the analyses of offender samples. In addition, the crime lab had to re-analyze about 3,100 samples it had previously analyzed using the older technique.

Ultimately, the success of the DNA database program is dependent upon analyzing and uploading convicted offender profiles, **and** then comparing unsolved crime-scene evidence against these profiles. While the crime lab is taking steps to eliminate its backlog of offender samples, it has performed DNA analysis on only a few non-suspect crime-scene cases. Specifically, there are only 45 crime-scene profiles that could be compared to and matched with the convicted offender profiles.

Although the crime lab realizes the importance of analyzing and uploading DNA evidence from unsolved crimes, crime lab policy and practices have traditionally required a suspect to be identified before DNA analysis will be conducted on any submitted crime-scene evidence. The National Commission on the Future of DNA Evidence states that such a practice is a key barrier to the full and effective use of DNA technology in the criminal justice system.

Crime Lab Needs to Take Additional Steps to Address Toxicology Backlog (See pages 25 through 33)

The toxicology unit suffers from a backlog of unanalyzed cases, with some going unanalyzed for more than 5 months. In February, this unit, which analyzes blood and urine samples for alcohol and drugs, had 1,189 unanalyzed samples awaiting assignment to a criminalist for 30 days or more: 633 for alcohol testing and 556 for drug testing. Furthermore, within this backlog, more than 100 alcohol and 300 drug cases had been unassigned for 90 days or more. Not being able to process samples in a timely manner can delay prosecutions, since some prosecutors will not charge a suspect until they receive test results. Furthermore, some samples may deteriorate if stored for long periods of time.

From 1998 to 1999, alcohol submissions grew by 42 percent and drug screen requests by 31 percent.

The backlog stems primarily from a large increase in the number of samples submitted by law enforcement agencies from 1998 to 1999. During this time, alcohol submissions grew by 42 percent, while drug screen requests grew by 31 percent. Dealing with this growing workload was made more difficult by turnover among experienced staff and by equipment limitations. Consequently, the crime lab has taken some steps to address backlogs, particularly in blood alcohol testing. For example, it has filled vacancies and purchased two new blood alcohol measurement instruments that expanded the number of blood alcohol samples that can be processed at one time from 38 to 50. Although these steps are positive, they alone will not resolve the backlog.

Therefore, the crime lab needs to take further actions designed to streamline its procedures and allow criminalists to focus more time on analytical activities. The crime lab should assess whether the current lab technician responsibilities can be expanded. Allowing technicians to assist in setting up and repackaging specimens could allow criminalists to spend more time on more rigorous analyses. In addition, the crime lab should acquire software to allow direct transfer of case information from lab instruments to the crime lab's automated system. Finally, as a longer-term solution, the crime lab should study the costs and benefits of expanding blood alcohol testing to both its northern and southern regional crime labs.

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INTRODUCTION AND BACKGROUND

The Office of the Auditor General has conducted a performance audit of the Department of Public Safety's Scientific Analysis Bureau as part of a Sunset review of the agency. This audit was conducted pursuant to a June 16, 1999, resolution of the Joint Legislative Audit Committee. This audit was conducted under the authority vested in the Auditor General by Arizona Revised Statutes §41-2951 et seq. This is the second of several audits of the Department of Public Safety.

Crime Lab Provides a Variety of Services to Arizona's Law Enforcement Community

The Department of Public Safety's (DPS) Scientific Analysis Bureau (known as the crime lab) is part of the Criminal Justice Support Division, which provides diverse scientific, technical, and other support services essential to promoting public safety in Arizona.¹ The crime lab was established to provide assistance to Arizona's law enforcement community by analyzing submitted physical evidence related to a crime. As such, the crime lab has established the following mission statement:

"To assist the Department, the Arizona criminal justice community and the public in the timely investigation and adjudication of criminal cases by utilizing state-of-the-art analytic techniques; providing the most accurate scientific analyses of evidence and presenting expert court testimony. To provide for the storage and appropriate disposition of property and evidence in the most efficient manner."

¹ The Division also includes the Arizona Automated Fingerprint Identification System (AZAFIS); Licensing; Telecommunications; Operational Communications; Permits and Firearms Clearance; and Criminal Information Bureau.

In meeting the needs of the State's criminal justice system, the crime lab performs a variety of services. Among them, crime lab staff:

- **Conduct scientific analyses of submitted evidence**—The crime lab's experienced forensic scientists (known as criminalists) perform a wide range of scientific techniques on various items submitted as evidence, such as blood, urine, hair samples, and glass and metal fragments. The types of analyses performed include DNA (deoxyribonucleic acid), arson, and explosive and firearm examination, as well as toxicology and identification of latent (invisible) fingerprint impressions. (See Appendix A, page a-i, for a complete description of analyses performed.) All analytical results undergo various quality assurance reviews before a final report is issued to the submitting law enforcement agency.

- **Provide expert court testimony**—In addition to issuing a report containing the scientific results, the criminalist who performs the analysis is responsible for providing objective testimony as to how he/she arrived at the results. Therefore, the criminalist prepares for court appearances through pretrial conferences with both prosecuting and defense attorneys, and periodically travels and testifies in municipal, justice, superior, and federal courts throughout the State.

Crime Labs Seek Scientific Truth

The **fundamental responsibility** of crime laboratories nationwide is **to seek the scientific truth regarding evidence submitted for analysis**. Therefore, the forensic scientist is not interested in whether his or her results implicate or exonerate a suspect, only that they are completely thorough and accurate—ultimately, it is the jury's task to determine guilt or innocence.

Source: Arizona Department of Public Safety, Annual Overview Report for Fiscal Year Ending June 30, 2000.

- **Instruct officers on proper evidence handling**—Crime lab personnel instruct investigative officers on the proper identification, collection, and packaging of evidence, as well as disseminate safety information on the handling of hazardous evidence (i.e., explosives, biological contaminants). This in-

struction helps improve the quality and selection of evidence submitted for analysis.

- **Assist officers at crime scenes**—Officers investigating crime scenes often encounter situations where the technical and scientific knowledge of crime lab personnel is required. For example, crime lab personnel assist at crime scenes by locating fingerprint evidence, and occasionally examining fire scenes for arson evidence. Lab personnel also provide aid at clandestine drug lab scenes (methamphetamine labs) by identifying contraband drugs and collecting proper samples for subsequent laboratory analysis.

The DPS crime lab provides its services free of charge to a total of 277 separate entities.

The DPS crime lab provides its services free of charge to a total of 277 separate entities throughout Arizona, which include state, county, municipal, and federal agencies.¹ While the majority are law enforcement agencies receiving regular and continued support, some are state agencies that require occasional specialized services to meet their statutory responsibility. For example, the Game and Fish Department may request the crime lab to compare bullets found in an illegally killed animal to a suspect's weapon. During fiscal year 1999-2000, the crime lab's property and evidence unit received evidence from 37,428 cases, 17,558 from DPS officers and 19,870 from outside agencies.

Noteworthy Distinctions and Acknowledgements

The DPS crime lab has achieved certain distinctions in the forensic science field. According to crime lab officials, some of its noteworthy acknowledgements are as follows:

- Since 1982, Arizona's crime lab has been accredited by the American Society of Crime Laboratory Directors Laboratory Accreditation Board (ASCLD/LAB). It was the second crime lab in the United States to receive this status. To retain its accreditation, each scientific discipline undergoes com-

¹ One agency, the Federal Bureau of Investigation (FBI), pays the crime lab to process FBI and Indian tribe cases through an intergovernmental agreement.

prehensive inspections every five years. In addition, the crime lab must maintain an extensive written quality assurance program and requires each of its forensic scientists to successfully complete a proficiency test from an external source at least annually.

- DPS laboratory scientists participate in accreditation for many ASCLD/LAB applicant laboratories. Two DPS laboratory managers were selected to assist in the accreditation of the FBI laboratory and other laboratory scientists have been involved in the ASCLD/LAB accreditation inspection process for more than 50 laboratories, both nationally and internationally. Further, the crime lab acts as a referee laboratory for the State of Pennsylvania by analyzing and confirming the accuracy of submitted blood alcohol specimens.

Organization, Staffing, and Equipment

For fiscal year 1999-2000, the DPS crime lab was authorized 113 full-time equivalent (FTE) positions, delivering services from four locations across the State: Northern (14 FTE in Flagstaff); Southern (13 FTE in Tucson); Western (8 FTE in Lake Havasu City); and Central (78 FTE in Phoenix). The majority (76) of these positions are criminalists from entry level to management. In addition, the crime lab also employs lab technicians, latent print examiners,¹ evidence custodians, and administrative and secretarial staff.

The crime lab maintains about \$3 million worth of specialized scientific and technical equipment unique to its operations. Smaller, lower-cost equipment used throughout the laboratory includes such items as scales, cameras, and microscopes. The lab also uses a number of more costly items such as gas chromatography mass spectrometry (GCMS) instruments used for testing a suspect's blood or urine for drugs and alcohol, genetic analyzers used in the DNA unit, and a scanning electron microscope used

¹ Latent print examiners conduct technical examinations to identify, develop, and preserve latent (invisible) fingerprints.

Introduction and Background

in the analysis of minute (trace) pieces of evidence, such as fibers or hairs. Some of the larger instruments cost over \$120,000 and can require maintenance contracts costing up to \$60,000 per year.

Figure 1

**Department of Public Safety
Crime Lab
Regional Statewide Crime Lab Locations
As of July 2000**



Budget

For fiscal year 1999-2000, the crime lab's appropriation was an estimated \$8.2 million, with \$2.4 million supplied from the General Fund. Nearly \$5.0 million came from the Criminal Justice Enhancement Fund (CJEF) for use in the DNA testing and identi-

fication system, operating support of the drug analysis unit, and assistance to the DPS crime lab for laboratory services, scientific equipment, and training.¹ Much of the remainder was supplemented by intergovernmental agreements with the FBI for analysis of FBI and Indian cases and funds from Maricopa County for processing clandestine laboratory scenes (see Table 1, page 7). A \$385,000 item entitled “Aid to organizations” is directly distributed to the city crime labs in Mesa, Phoenix, Scottsdale, and Tucson for enhanced laboratory services, purchase of equipment, and education and training.²

Audit Scope and Methodology

This performance audit focuses on two units within the State’s crime lab, the DNA unit and the toxicology unit. Audit work was conducted to assess the units’ compliance with statute and their capabilities to analyze existing evidence samples. Several methods were used to study the issues addressed in the audit, including:

- Reviewing laboratory policies and procedures for protocols and quality assurance; statutes that mandate laboratory functions, requirements for criminalists’ certification and laboratory accreditation; and monthly reports to determine the adequacy of information reported from management;
- Conferring with the national accrediting organization (ASCLD) to obtain specifics on accreditation requirements; and consulting with law enforcement officials and county and city prosecutors to identify concerns and determine satisfaction with lab services;

¹ The Criminal Justice Enhancement Fund (CJEF) consists of monies derived from an assessment imposed on criminal and civil penalties and is distributed per A.R.S. §41-2401 among various criminal justice agencies.

² These funds represent the crime lab assessment fund, a 2.3 percent expenditure of CJEF monies, which is directly allocated to political subdivisions that operate crime labs.

Table 1

**Department of Public Safety
Crime Lab
Statement of Revenues, Expenditures, and Changes in Fund Balance ¹
Years Ended June 30, 1998, 1999, and 2000
(Unaudited)**

	1998 (Actual)	1999 (Actual)	2000 (Estimated)
Revenues:			
Appropriations:			
State General Fund	\$2,244,900	\$2,743,000	\$2,428,700
Criminal Justice Enhancement Fund ²	3,338,700	3,522,100	4,975,300
Intergovernmental	954,639	1,630,401 ³	790,700
Charges for services	41,452	64,624	45,000
Other	<u>11,512</u>		<u>300</u>
Total revenues	<u>6,591,203</u>	<u>7,960,125</u>	<u>8,240,000</u>
Expenditures:			
Personal services	4,341,839	4,756,651	5,116,000
Employee related	838,226	944,153	1,116,100
Professional and outside services	122,328	53,251	55,200
Travel, in-state	23,481	27,151	20,000
Travel, out-of-state	30,316	40,077	9,800
Aid to organizations ⁴	252,500	260,100	385,100
Other operating	764,300	987,665	1,165,500
Equipment	<u>613,238</u>	<u>606,360</u>	<u>472,500</u>
Total expenditures	<u>6,986,228</u>	<u>7,675,408</u>	<u>8,340,200</u>
Excess of revenues over (under) expenditures	(395,025)	284,717	(100,200)
Reversions to the State General Fund	<u>4,839</u>	<u>65,057</u>	<u>1,100</u>
Excess of revenues over (under) expenditures and reversions to the State General Fund	(399,864)	219,660	(101,300)
Fund balance (deficit), beginning of year	<u>397,935</u>	<u>(1,929)</u>	<u>217,731</u>
Fund balance (deficit), end of year	<u>\$ (1,929)</u>	<u>\$ 217,731</u>	<u>\$ 116,431</u>

¹ The Department calculated the program's revenues and expenditures by allocating revenues and expenditures recorded in the Department's Joint Account. The Joint Account is a commingled account primarily funded from State General Fund appropriations and other appropriated monies, such as Criminal Justice Enhancement monies.

² Consists of fines and forfeits deposited in the Criminal Justice Enhancement Fund and appropriated to the Department. Amounts presented do not include monies appropriated but unspent at year-end that are retained by the Department and are subject to legislative appropriation in future years. In 2000 the Department received additional monies to purchase equipment for the crime lab system, update its DNA analysis technology, support local labs, and provide other personal services and operating costs.

³ The Department was awarded several new federal contracts that created additional revenue in 1999. Only one of these new contracts continued into 2000.

⁴ Consists of monies passed through the Department to local crime laboratories in accordance with A.R.S. §41-2415.

Source: Auditor General staff analysis of financial information provided by the Department of Public Safety.

Introduction and Background

- Observing laboratory procedures, training sessions for new staff, and criminalist court testimony to become familiar with analytical methods and length of time needed for lab activities; and
- Interviewing officials from 11 other states and 4 city crime labs within Arizona to obtain information about best practices for analyses of evidence and backlogs.¹

This report presents findings and recommendations in two areas:

- The need for the crime lab to take additional steps to advance its crime-solving capabilities through the use of its DNA database; and
- The need for the crime lab to take additional steps to address its backlog of alcohol and drug evidence samples.

This audit was conducted in accordance with government auditing standards.

The Auditor General and staff express appreciation to the Director and staff of the Arizona Department of Public Safety for their cooperation and assistance during the audit.

¹ Auditors contacted crime labs in California (northern and central), Florida, Georgia, Illinois, Michigan, New York, North Carolina, Pennsylvania, Texas, Virginia, and Washington. They also communicated with city crime labs in Mesa, Phoenix, Scottsdale, and Tucson. The states contacted were considered role models in the industry according to criminalists in both the city labs and the DPS crime lab.

FINDING I

STEPS NEEDED TO EXPAND THE DNA DATABASE PROGRAM'S CRIME-SOLVING POTENTIAL

Arizona is just beginning to have a DNA database program that can help solve crimes. Such database programs allow law enforcement personnel to match crime-scene evidence against a database containing DNA profiles of people who have already been convicted of specific crimes. In the crime lab's program, however, fewer than 2,000 of the 7,623 submitted blood samples from convicted offenders have been analyzed with up-to-date techniques and uploaded to the database. Even if all submitted offender samples were uploaded to the database, the database contains few crime-scene evidence profiles for comparison to offender profiles on file. The crime lab is taking steps to reduce the backlog of unanalyzed offender samples, but it needs to expand its efforts at analyzing non-suspect crime-scene evidence to ensure the database meets its potential as a crime-solving tool.

DNA Databases Can Help Identify Repeat Offenders and Solve Crimes

Since 1990, crime labs across the nation have expanded their use of DNA analysis by establishing databases to store DNA profiles of convicted offenders and help solve crimes. Some states are beginning to experience success in solving crimes by matching crime-scene evidence to profiles of convicted offenders. Arizona's program, which began in 1993, is also just beginning to realize its crime-solving capability.

Crime labs have expanded from analyzing individual samples to building databases—During the past decade, crime labs across the nation have expanded their role from simply conducting DNA analyses of identified suspects to developing databases of

convicted offenders that can help law enforcement identify repeat perpetrators or establish links or patterns among crimes.¹ Prior to the development of the DNA database, forensic DNA analysis was used primarily in cases where a known suspect's DNA could be compared to crime-scene evidence. In 1990, however, the Federal Bureau of Investigation (FBI) began developing a local, state, and national database that could aid law enforcement officials in identifying repeat offenders. As Figure 2 (see page 11) shows, such databases are compiled by first analyzing blood samples from convicted offenders and entering them into the DNA database. If forensic evidence is available from a crime scene, it can then be analyzed and compared with the offender profiles in the database to determine if a match exists. A database match can either link two unsolved crime-scene cases or link an unsolved case to a convicted offender.

A few states collect samples from all convicted felons.

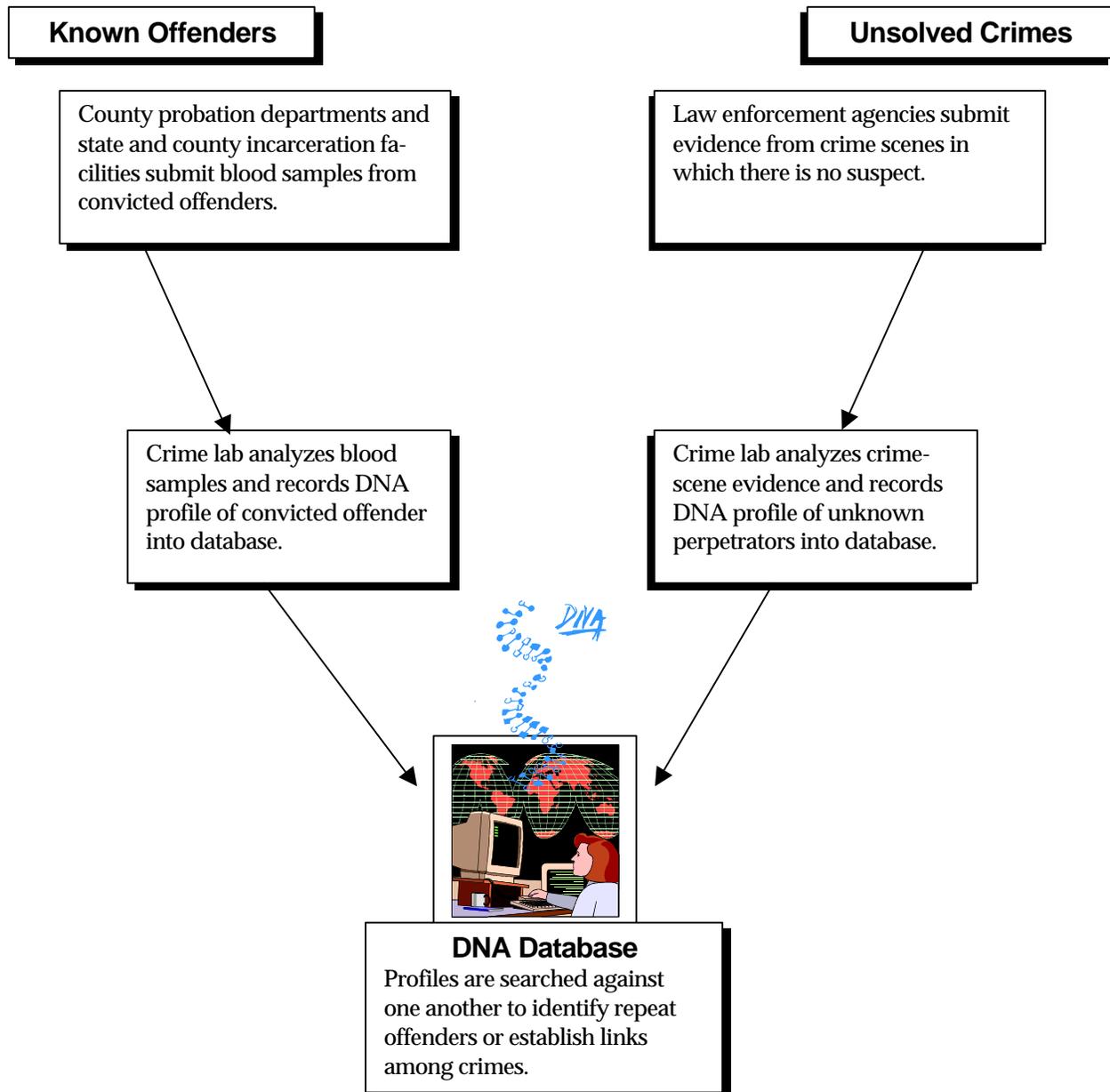
Since 1989, all 50 states have passed laws requiring persons convicted of certain crimes to submit a sample for unique DNA profiling. Most states collect samples from only certain types of offenders, such as those convicted of homicide or sex crimes, while at least five collect samples from all convicted felons (Alabama, New Mexico, Tennessee, Virginia, and Wyoming).

Some states' programs are yielding results—Some states are beginning to experience success in matching DNA profiles to crime-scene evidence. For example, Virginia, a state that collects samples from all convicted felons, receives about 1,500 convicted offender samples per month and reported 75 matches in their database during 1999. Similarly, Florida, a state that collects samples from individuals convicted of sexual offenses, murder, assault, or robbery, receives an average of 667 convicted offender samples per month and has had over 200 matches since 1992, with some of these matches either linking or solving multiple crimes. Eventually, all states' databases will be linked, allowing searches across the nation.

¹ DNA (deoxyribonucleic acid) is a molecule found in chromosomes within the nucleus of each cell in the human body that carries the body's genetic information. It is generally accepted that, except for identical twins, the DNA found in each individual is unique.

Figure 2

**Department of Public Safety
Crime Lab
DNA Database Program
Matching Known Offenders with Unsolved Crimes**



Source: Auditor General staff analysis of information provided by the crime lab.

Arizona's program has had five database matches.

Arizona's program has just recently experienced its first database matches—Arizona's program, which has been in place since 1993, is just beginning to experience its first database activity. Arizona's first database match occurred in December 1999, when an Arizona crime-scene case was linked to an unsolved crime in California. So far during 2000, Arizona's database has had four additional matches: in May the database made a link between two Arizona crime-scene cases, and in June, three separate Arizona crime-scene cases were matched to convicted offenders from California, Kentucky, and Wyoming.¹

Arizona's offender database is currently limited to certain sex offenses, such as sexual assault or child molestation (see Appendix B, page b-i, for offenses subject to DNA testing). However, during the 44th Legislature's Second Regular Session, the Legislature broadened the DNA testing statute to include additional offenses, such as homicide and burglary.² Statute requires county probation departments and state and county incarceration facilities to secure blood samples from those specific offenders and submit them to DPS for analysis. DPS currently receives approximately 64 samples per month from convicted sex offenders. The crime lab has assigned three criminalists to perform DNA profiling on these convicted offender samples. In addition, the lab also employs 12 other DNA criminalists statewide who primarily analyze evidence from crime scenes in which there is an identified suspect.

¹ In addition to crime-scene evidence analyzed by DPS, the State's four city-operated labs (Mesa, Phoenix, Scottsdale, and Tucson) may each submit DNA profiles of crime-scene evidence to be uploaded to DPS' database in hopes of locating a suspect and solving a crime.

² Laws 2000, Chapter 373, expanded DNA testing to include, in addition to certain sex offenders, those individuals convicted of homicide and burglary in the first and second degree, effective January 1, 2001. In addition, effective January 1, 2002, the testing will be expanded to also include crimes involving the discharge, use, or threatening exhibition of a deadly weapon or the intention or the knowing infliction of serious physical injury.

Crime Lab Is Addressing Its Large Offender Backlog Through Outsourcing

To be effective, a database program should be able to collect, analyze, and upload convicted offenders' blood samples on a timely basis. In Arizona's program, however, only about one-fourth of all blood samples received from offenders are currently in the database. The primary factor contributing to the crime lab's significant backlog is a recent change in DNA analysis techniques. Although the crime lab is taking steps to help reduce this backlog, it will need to consider more actions, such as outsourcing more work, to resolve the backlog.

Only one-fourth of submitted offender samples are currently available for database searches—While the success of the State's database is dependent on matching non-suspect crime-scene cases against profiles of convicted offenders contained in the database, crime lab records show that the database contains only one-fourth of the offender samples it has received. As of July 2000, the crime lab had received 7,623 blood samples from convicted sex offenders, yet only 26 percent (1,993 of 7,623) had been analyzed using current methods and uploaded to the State's DNA database. The remaining three-fourths of the samples are at various stages in the process, but are unavailable for comparison to crime-scene profiles. As shown in Figure 3 (see page 14), 38 percent have undergone the initial analysis but are awaiting necessary quality control reviews before they can be uploaded to the database; 6 percent have just recently been assigned for analysis; and 30 percent have not yet been assigned for analysis.

Prompt analysis is important for all offenders, whether incarcerated or in the community.

Research indicates that prompt analysis is important for all offenders, whether under community supervision, soon to be released from incarceration, or just recently convicted, because many are repeat offenders and can be linked to unsolved crimes. For example, one study determined that for every rape conviction, an offender has committed an average of 5.2 unsolved rapes.¹ In addition, the chance of convicted persons committing

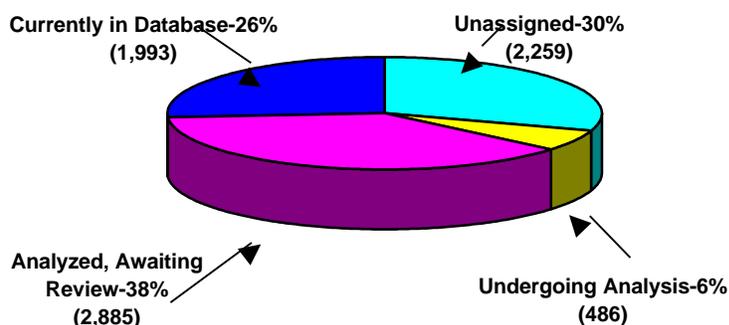
¹ Groth, Nicholas, Robert Longo, and J. Bradley McFadin. Undetected Recidivism Among Rapists and Child Molesters. *Crime and Delinquency*, July 1982.

other crimes has been shown to be highest in the first 18 months after release. Even those offenders recently convicted and sentenced to lengthy prison terms could be responsible for other unsolved crimes.

Change in methods required additional training and need to re-analyze samples—The lab’s ability to analyze and upload offender profiles has been impacted by changes in DNA methods. Up until 1998, most labs were analyzing their convicted offender

Figure 3

**Department of Public Safety
Crime Lab
Status of Convicted Offender Samples
Submitted for DNA Analysis
As of July 12, 2000**



Source: Auditor General staff analysis of crime lab data on 7,623 convicted sex offender samples it has received.

The new DNA method produces faster, better results.

samples using a method known as RFLP (restriction fragment length polymorphism). With the intent of improving analysis and providing a more consistent method by which to match profiles nationally, crime labs began converting to the STR (short tandem repeats) method of analysis. STR offers great promise for

forensic analysis since it produces results faster (2-3 weeks, as compared to 6-8 weeks with RFLP), requires a smaller-sized sample for analysis (as small as a pinhead), and provides a greater degree of certainty as far as positively identifying or excluding an individual as the perpetrator.

Switching to the STR format required criminalists of all levels to undergo months of additional training that temporarily halted the analyses of offender samples. Further, because the switch to the STR format essentially made RFLP and any profiles analyzed in this format obsolete, Arizona's crime lab was required to re-analyze about 3,100 samples it had previously analyzed in the RFLP format.

Crime lab should expand its offender sample outsourcing and ensure timely technical reviews—In order to eliminate its backlog of convicted offender samples more quickly, the crime lab should consider expanding its use of outsourcing. Using vacancy savings, the DNA unit recently contracted with a private lab to outsource approximately 2,500 of its backlogged offender samples. While the private lab will conduct the majority of work involved, DPS will continue to perform at least 25 percent of the work. For example, DPS will prepare samples for transfer to the private lab, conduct necessary reviews of analysis results, perform reanalysis of 5 percent for quality control, and upload completed DNA profiles to the State's DNA database.

It cost DPS nearly \$100,000 to outsource approximately 2,500 offender samples (at \$38.75 per sample). The samples were provided to the contract lab in late April, returned as of late June 2000, and are awaiting the necessary reviews before the crime lab can upload them to the DNA database. DPS indicates that it will take approximately two months before these samples can be added to the database. Given the size of the remaining backlog (approximately 2,250 samples), the crime lab should consider expanding its use of outsourcing to include all remaining backlogged offender samples as well as devising a system for expediting the review of any contracted samples.

Recent outsourcing of approximately 2,500 samples cost nearly \$100,000.

**Greater Emphasis Needed
to Ensure More Crime-Scene
Profiles Are Available for
Database Comparisons**

While the crime lab is taking steps to ensure convicted offender samples are analyzed and uploaded, there remains a serious lack of non-suspect crime-scene cases available for database comparisons. Currently, the database contains only a few unsolved cases that can be compared, and possibly matched, to offender profiles. Several factors contribute to this lack of non-suspect profiles, including a crime lab policy requiring a suspect to be identified before DNA analysis will be performed, and the crime lab's need to place greater emphasis on cases with a set court date or identified suspect.

Having few non-suspect crime-scene profiles available severely limits the DNA program's success—Because the DNA database contains only a few non-suspect crime-scene profiles, Arizona's database program has limited capacity for success. The crime lab reports that as of July 2000 the database contains profiles from only 45 unsolved crimes.¹ The National Commission on the Future of DNA Evidence states that the limited use of DNA in non-suspect cases is a key barrier to the full and effective use of DNA technology in the criminal justice system (January 2000 report).²

*Database contains profiles
from only 45 unsolved crimes.*

¹ In addition to the unsolved crime profiles, the State's DNA database contains approximately 140 profiles from cases where an identified suspect matched crime-scene evidence. The crime lab often retains the perpetrator's profile in the database for use as an investigative aid in other cases. If the identified suspect is later convicted, the crime lab will remove the suspect's profile once a convicted offender sample is received, analyzed, and uploaded to the offender portion of the database. Additionally, the crime lab reports that about 50 profiles previously analyzed in the older method (RFLP format) could be analyzed using the newer method (STR format) and uploaded.

² In 1997, United States Attorney General Janet Reno directed the National Institute of Justice to establish and administer the National Commission on the Future of DNA Evidence for the purpose of maximizing the value of forensic DNA evidence in the criminal justice system. The Hon. Ronald Reinstein, Associate Presiding Judge of Superior Court in Arizona, is among the 21 prominent professionals appointed to the Commission.

Consequently, as demonstrated by Arizona's recent matches involving non-suspect crime-scene evidence, the analysis of such non-suspect evidence is crucial to the success of the DNA program.

Several factors contribute to the lack of non-suspect crime-scene profiles—Although the crime lab realizes the importance of analyzing and uploading DNA evidence from unsolved crimes, a few key factors have kept it from doing so.

The crime lab considers its top priority cases with a known suspect.

- **Crime lab policy gives priority to cases with a known suspect**—Crime lab policy and practices have traditionally required a suspect to be identified before DNA analysis will be conducted on any submitted crime-scene evidence. When law enforcement agencies submit crime-scene evidence from cases with no known suspects, the crime lab typically limits its work to conducting a preliminary analysis that determines if there is biological evidence (i.e., semen, saliva, or blood) that could identify the perpetrator. Despite the fact that this evidence could ultimately be used for database comparisons, the crime lab requires the county prosecutor to submit a request for DNA analysis before DPS will conduct further analyses and develop a DNA profile. The lab indicates that it established this procedure to help prioritize its workload, since it considers its number one priority to be those cases with a set trial date or with suspects under investigation. As a result, prosecutors usually do not submit requests until they have a suspect or an upcoming court date.

- **Original DNA mandate did not provide funding for non-suspect case analysis**—According to crime lab management, the DNA unit has been unable to analyze more non-suspect cases because throughout the database program's history it has not received funding specifically for this purpose. Although the original DNA mandate provided funding for three criminalists to perform analysis on submitted offender samples, it did not provide specific funding for DPS to conduct DNA analysis on non-suspect cases. As a result, the crime lab has not assigned any specific criminalist the responsibility of analyzing non-suspect cases. Consequently, the lab reports that it assigns these non-suspect cases for DNA analysis only as the DNA unit's workload allows.

- **Crime lab has never assessed funding needs for analyzing non-suspect cases**—While the crime lab attributes its low number of analyzed non-suspect cases to inadequate funding, it has never developed a request for additional funding to more fully implement its DNA program, citing other funding needs as having taken priority when making its budget requests.

The actual number of unsolved cases statewide that contain crime-scene evidence capable of producing the perpetrator’s DNA profile is largely unknown. However, the DPS crime lab estimates that it has performed preliminary analyses on as many as 400 unsolved crimes, and determined that in most cases further analyses could produce a DNA profile suitable for the database. Nonetheless, the crime lab has not performed further analyses to produce these DNA profiles.

Actual number of unsolved crimes suitable for analysis is unknown.

Other states are also experiencing a shortage of crime-scene samples being available for DNA comparison. The National Commission on the Future of DNA Evidence has determined that a vast number of law enforcement officers throughout the country lack the education and resources to use the database system effectively. Specifically:

“Many departments [crime labs] continue a policy that requires the identification of a suspect before approval for DNA analysis is granted. While that policy was appropriate prior to the advent of CODIS [DNA databases], the database system makes that policy illogical. If the criminal justice system is to truly realize the advantages of the database, it should be effectively accessed in the investigative stage. That requires that law enforcement be educated about the database and given the appropriate resources to have DNA testing performed in non-suspect cases.”

Crime Lab Should Expand Its Procedures and Assess Resource Needs for Operating DNA Program

To ensure Arizona’s DNA database can serve as an effective crime-solving tool, the crime lab needs to develop a strategic plan, expand its policies and procedures, and determine resource needs for effectively managing the DNA database program.

Strategic plan should emphasize activities unique to DNA program.

Develop a strategic plan specific to the DNA program's unique operations—As a first step in further developing its database program, which consists of analyzing both convicted offender samples as well as non-suspect crime-scene evidence, the crime lab should establish a strategic plan specific to its database program. As part of this strategic plan, the crime lab should define the database program's mission and goals, as well as establish key objectives and performance measures. While the crime lab has a general strategic plan for its more traditional forensic analyses, it is important that it develop a plan that can address some of the database program's more unique activities, such as performing DNA analysis on crime-scene evidence prior to the identification of a suspect. In addition, establishing the database program's goals and performance measures could assist DPS in assessing whether the program is improving in analyzing and uploading both convicted offender and non-suspect crime-scene evidence profiles; assisting in solving criminal cases; and maximizing its available resources. Moreover, the plan's specific goals, objectives, and performance measures should also address time frames for analyzing both convicted offender samples and non-suspect crime-scene evidence; projected workloads for each area; and the frequency of database searches.

Expand its procedures to improve the DNA program's operation and management—Acting within its statutory authority, the crime lab should expand its existing procedures to improve the DNA program's operation and management. Although A.R.S. §41-2418 directs the crime lab to establish procedures for the implementation of the State's DNA testing legislation, the crime lab's current procedures primarily address the lab's processing of submitted offender samples and uploading completed analyses to the State's database.

While the DPS crime lab does not have statutory authority to collect offender samples or enforce the submission of non-suspect crime-scene evidence, the crime lab can serve to facilitate improved coordination among those agencies involved in and affected by the DNA database program. Therefore, to improve the operation and management of the State's DNA database program, the DPS crime lab should expand its current procedures. These expanded procedures should minimally focus on:

The crime lab should periodically assess how many unsolved cases could be analyzed.

■ **Identifying non-suspect crime-scene evidence appropriate for analysis**—The crime lab should develop procedures for periodically assessing the amount of non-suspect crime-scene evidence available for database comparison. The crime lab reports that it meets with various police departments around the State as often as twice per year to educate the law enforcement community regarding the DNA database’s value as a crime-solving tool. However, DPS acknowledges it has not assessed to what degree police departments are retaining non-suspect crime-scene evidence appropriate for analysis. Furthermore, according to crime lab management, while the law enforcement community desires more non-suspect sample analysis, it is aware of DPS’ resource limitations. Therefore, DPS should establish guidelines for determining what non-suspect case evidence it will analyze and for prioritizing its analysis of non-suspect cases, as police departments may submit evidence from both recent and older cases.

Crime lab can improve its coordinating role.

■ **Coordinating submission of offender samples**—The crime lab should establish procedures for improving the coordination among those agencies responsible for submitting offender samples. While statute does not assign any one entity the oversight role of ensuring that those statutorily required samples are submitted for analysis, DPS does serve as Arizona’s database administrator and central repository for all collected offender samples. Although the number of offender samples owed to the DPS crime lab is unknown, the National Commission on the Future of DNA Evidence estimates that in June 2000 over 1 million convicted offender samples nationally were owed to crime labs but had not been collected.

Additionally, statute directs DPS to not secure a blood sample if one has previously been submitted; however, crime lab records confirm that it has received a minimum of 400 duplicate samples. Auditors found that many submitted samples are missing identifying information—such as the offender’s social security number, birth date, complete name, or state identification number—which is needed to confirm whether a sample has already been submitted.

Although DPS does not have the statutory authority for collecting offender samples, it can take steps to help ensure that samples are submitted with accurate and complete

identifying information, and provide followup to submitting agencies when incomplete information is submitted. To help prevent duplicate samples, DPS should also develop a procedure to provide to the submitting agencies regular access to those offenders from whom the crime lab has already received a sample.

- **Revising its prioritization of offender sample analysis**—Because of the significant backlog of convicted sex offender samples, the crime lab devised a system for prioritizing its work based on an offender’s risk of recidivism. Many convicted sex offenders are required to register with the DPS sex offender notification unit, whereby, just prior to release, an offender’s recidivism risk is assessed and each offender is assigned a risk assessment level. The crime lab uses this risk level to help prioritize its workload on the backlog. However, beginning January 1, 2001, the crime lab will begin to receive samples from offenders convicted of crimes other than sex offenses, namely burglary and homicide. Therefore, the crime lab should revise its current prioritization model to take into account all the various offense types subject to DNA testing.

Develop strategies for maximizing its current resources and determining future funding needs—In conjunction with enhancing its policies and procedures, the crime lab needs to develop a strategy for addressing its backlog of offender samples while expanding its analysis of non-suspect crime-scene evidence. Additionally, as the DNA testing statute was recently expanded to include offenses such as homicide and burglary, the crime lab will need to assess how this expansion will ultimately affect its future resource needs. Specifically, the crime lab should:

- **Capitalize on opportunities to outsource its convicted offender samples**—While the crime lab has recently outsourced approximately 2,500 of its backlogged offender samples using vacancy savings, it should seek other opportunities to outsource more of its offender samples. Other states, as well as the National Commission on the Future of DNA Evidence, recognize the value in contracting out offender samples as a means of allowing state crime labs to concentrate their existing resources on non-suspect crime-scene cases. The crime lab recently applied for a National Institute of Justice grant that, if awarded, will allow the lab to outsource an

To the extent possible, the crime lab should outsource its offender samples.

additional 5,200 offender samples. This would allow the lab to outsource not only its remaining backlog of approximately 2,250 samples, but also as many as 2,950 offender samples it receives in the future. Currently, the crime lab receives an average of 64 offender samples a month requiring analysis. However, in response to the recent expansion of the State's DNA testing statute, the Department of Corrections estimates that it may submit as many as 6,000 samples to DPS for analysis within the first few months of next year. Therefore, in order to manage its analysis of offender samples, the crime lab should seek other opportunities to expand its use of outsourcing, such as continuing to use vacancy savings or seeking new funding sources.

Ultimately, more cases could be solved if the lab increases its emphasis on non-suspect case analysis.

- **Dedicate criminalists specifically to non-suspect case analysis**—To ensure non-suspect cases are regularly analyzed and uploaded to the DNA database, the crime lab should immediately dedicate specific DNA unit criminalists the responsibility of analyzing non-suspect crime-scene evidence. Newly added positions to this unit (fiscal year 2000) and the use of outsourcing should make some criminalist positions available for non-suspect case analysis. Specifically, with the addition of new positions, the crime lab will have 5 criminalists available for processing offender samples. Although DPS must complete some work even when outsourcing, if it continues to outsource, some of these criminalists should be available to work solely on non-suspect crime-scene evidence.

- **Determine the DNA program's future funding needs by performing regular assessments**—The crime lab needs to assess what additional resources may be necessary to ensure that both offender samples and non-suspect evidence is analyzed and uploaded to the database in a timely manner. As the DNA program continues to expand, and areas not previously addressed by the crime lab are emphasized, the crime lab needs to assess the adequacy of current resources and determine if the need for more resources exists. If so, the crime lab should actively pursue those needs through its budget requests.

Recommendations

1. The crime lab should develop a strategic plan specific to the DNA database program's operations, addressing its analysis of both convicted offender samples as well as non-suspect crime-scene evidence. At a minimum, this plan should define the DNA database program's mission and goals, and establish key objectives and performance measures for determining the program's efficiency and effectiveness.
2. To improve the operation and management of its DNA database program, the crime lab should expand its current procedures. These expanded procedures should minimally focus on:
 - a. Periodically assessing the amount of non-suspect crime-scene evidence available for database comparison;
 - b. Determining what non-suspect crime-scene evidence the crime lab will analyze and upload to the DNA database;
 - c. Prioritizing its analysis of non-suspect crime-scene evidence; and
 - d. Improving coordination with agencies responsible for submitting convicted offender samples to ensure submitting agencies are aware of the importance of submitting all samples and that they are submitted with accurate and complete identifying information.
3. The crime lab should continue in its efforts to reduce and prioritize its convicted offender backlog. Specifically, the crime lab should:
 - a. Seek opportunities to increase its outsourcing of offender samples to enable the DNA unit to concentrate on analyzing more non-suspect crime-scene evidence;
 - b. Develop effective procedures for ensuring that technical reviews are completed as quickly as possible; and
 - c. Revise current prioritization practices in consideration of present and future offenses subject to DNA testing.
4. The crime lab should dedicate one or more criminalists to the specific responsibility of analyzing non-suspect crime-scene cases.
5. In conjunction with developing procedures and reducing its offender sample backlog, the crime lab needs to regularly assess whether it has resources to effectively implement the DNA database program, and develop a request for additional staff and equipment if necessary.

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FINDING II

CRIME LAB NEEDS TO TAKE ADDITIONAL STEPS TO ADDRESS TOXICOLOGY BACKLOG

The crime lab needs to take further action to address a substantial backlog of work in the toxicology unit. This unit, which analyzes blood and urine samples for alcohol and drugs, had a backlog of nearly 1,200 samples in February, with some going unanalyzed for more than 5 months. Not being able to process samples in a timely manner can delay prosecutions, allow drug sample components to deteriorate, and disrupt the flow of work. The backlog stems primarily from a large increase in the number of samples submitted by law enforcement agencies and has been exacerbated by staff turnover and equipment limitations. The crime lab has taken steps to hire and train new staff and has added some new equipment. Although these steps are positive, they alone will not resolve the backlog. Several other steps, most of them involving ways to operate more efficiently, should be considered.

Toxicology Unit Tests for Alcohol and Illegal Drugs

The toxicology unit's principal task is to measure alcohol levels and identify the presence of illegal drugs in suspects' blood or urine samples. Additionally, the unit sometimes analyzes blood or urine to identify other substances, such as glue or paint fumes. Approximately 90 percent of the unit's work is directly connected to driving under the influence (DUI) cases, where a police officer making an arrest believes that either alcohol and/or drugs may have contributed to a suspect's impaired motor functions. The remaining toxicology casework stems from a variety of other crimes such as burglaries, homicides, and sexual assaults.

Approximately 90 percent of toxicology's work is related to DUI cases.

Law enforcement officers submit a suspect's urine or blood sample for either alcohol or drug testing, or both. For alcohol testing, the criminalist measures the alcohol quantity and, depending on the amount detected, may conduct additional analyses to identify

The drug testing process seeks to detect the presence of a drug rather than its quantity.

whether illegal drugs are also present.¹ The drug testing process seeks to detect the “presence” of a drug rather than its quantity. The criminalist first performs a drug screen to identify the presence of any of six drug categories (marijuana, cocaine, amphetamines, opiates, barbiturates, and benzodiazepines). If the screening shows positive results for any of these categories, separate analyses must be performed to confirm the presence of each identified drug. This separate analysis is more rigorous and ensures that the first drug screen did not contain any false positive results (i.e., indicate that a drug is present when in fact it is not). The central crime lab performs all drug screening and confirmation tests submitted statewide, whereas both the central and western crime labs perform alcohol quantity tests.

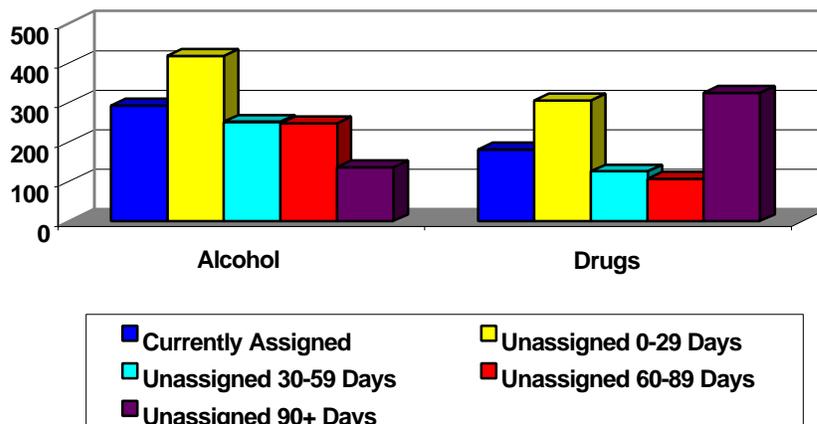
Increased Toxicology Backlog Affects Lab and Legal Community

The toxicology unit suffers from a backlog of unanalyzed cases. In February, it had nearly 1,200 alcohol or drug testing cases awaiting analysis for more than 30 days. This backlog impacts the unit’s service level and hinders the law enforcement community’s ability to resolve criminal cases in a timely manner.

Toxicology unit experiencing large backlog—The crime lab defines its backlog as any case that has been awaiting assignment to a criminalist for 30 days or more. As of February 17, 2000, the crime lab’s toxicology unit had 1,189 such cases—633 for alcohol testing and 556 for drug testing. Within this backlog, some cases go unaddressed for months. For example, more than 100 alcohol and 300 drug cases had been unassigned for 90 days or more (see Figure 4, page 27). On that date, the toxicology unit’s 8 criminalists were actively working on 473 alcohol and drug cases and had another 723 that were awaiting assignment but were less than 30 days old.

¹ State law has established an amount of 0.10 alcohol concentration as the legal limit at which a driver is considered impaired. If the lab determines the alcohol level to be 0.12 or higher, generally no drug analyses are performed unless the case is a fatality, homicide, or sexual assault. Furthermore, crime lab policy requires drug testing when the alcohol level is less than 0.12 or upon an officer’s request.

Figure 4
Department of Public Safety
Crime Lab
Status of Alcohol and Drug Cases Submitted for Analysis
As of February 17, 2000



Source: Auditor General staff analysis of the central regional crime lab's Laboratory Information Management System (LIMS) computer data as of February 17, 2000.

Backlogs can impact crime lab and law enforcement community—Although stakeholders such as city crime lab directors, city and county prosecutors, and chiefs of police praised the quality of the crime lab's work, they pointed out that lack of timeliness can cause problems. Interviews with crime lab staff and a review of articles discussing backlogs at other labs raised similar concerns. Backlogs can result in:

- **Delayed case resolution**—Untimely results can impact timely case resolution. Some prosecutors will not charge a suspect until they receive test results. As a result, a case may need to be delayed or even dismissed. Other problems include loss of contact with witnesses, and officers' loss of memory regarding case details.
- **Sample deterioration and storage problems**—Some samples (particularly urine samples) have a tendency to deteriorate if stored for long periods of time, which can impact drug testing and produce false negative results (i.e., indicate that a drug is not present when in fact it was). While literature concurs that drugs can deteriorate over time, the time frame in

which this happens can differ according to the individual drug. However, criminalists and city lab staff agree that certain drugs may lose stability when samples are stored for an extensive time, possibly decreasing the likelihood of detection. In addition, having more than four months' worth of samples awaiting analysis can also create storage problems.

- **Strain on staff and productivity**—Backlogs can create stress for lab staff because staff realize the impact of untimely service. Therefore, in an attempt to be responsive to law enforcement concerns, the crime lab places emphasis on processing upcoming court cases using a priority system. However, this can lead to workflow interruption because of continual phone calls from those awaiting analysis results and when cases are changed to “rush” status because a court date is approaching.

Several Factors Have Contributed to the Toxicology Backlog

The backlog in toxicology cases results from several factors. Perhaps most important, the number of alcohol and drug cases requiring analysis has risen substantially from 1998 to 1999. Dealing with this growing workload was made more difficult by turnover among experienced staff and by equipment limitations. The crime lab has taken some steps to address backlogs, particularly in blood alcohol testing, by filling vacancies and purchasing some additional equipment.

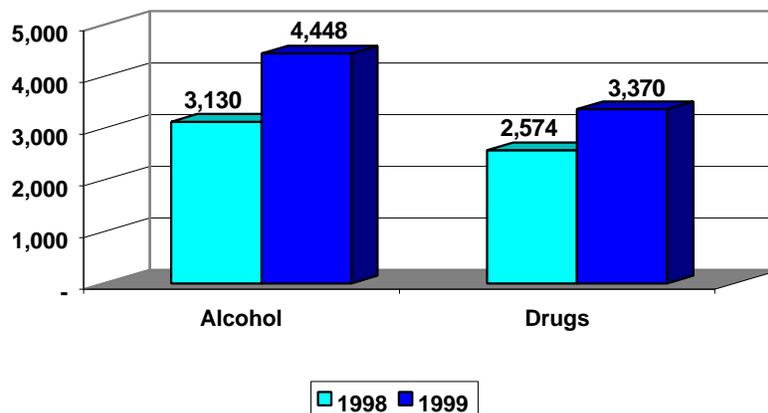
Workload grew substantially between 1998 and 1999—Over the past calendar year, the number of cases submitted annually has risen for both drug and alcohol cases. As shown in Figure 5 (see page 29), alcohol submissions grew by 42 percent (from 3,130 to 4,448), while drug screen requests grew by 31 percent (from 2,574 to 3,370). The crime lab attributes the rise in evidence submissions primarily to increased DUI enforcement and the

Over the past year, both alcohol and drug cases have grown considerably.

result of some police departments changing from breath alcohol testing methods to blood alcohol tests.¹

Figure 5

**Department of Public Safety
Crime Lab
Case Submissions Received
Years Ended December 31, 1998 and 1999**



Source: Auditor General staff analysis of the central regional crime lab's report of "Toxicology Requests Per Month" for years ended December 31, 1998 and 1999.

Staffing and equipment limitations affected toxicology unit's ability to respond—During the past year, the toxicology unit lost three experienced staff members (from a total of eight) when they transferred to other crime lab units. During the fall of 1999, the crime lab began to address this problem by filling vacancies and training new hires to perform alcohol analysis. Although the unit has had some success in hiring new criminalists, new hires must go through an extensive training process, including practicing on enough samples to pass proficiency tests and receiving certification from the Department of Health Services. This training period may take up to three months and also impacts the

¹ Some law enforcement agencies indicated that they are switching to blood alcohol testing methods from breath testing methods to avoid the current legal challenges facing the Intoxilyzer (breath testing system).

workload of experienced criminalists who provide both classroom and on-the-job training for new staff.

The toxicology unit's ability to respond to its increasing workload was also limited by equipment capacity. However, by December 1999, the unit acquired two new blood alcohol measurement instruments, expanding the number of blood alcohol samples that can be processed at one time from 38 to 50.

Lab Should Examine Other Steps to Reduce Backlog

The crime lab should consider some additional steps to address its backlog. Five possible steps were identified, ranging from streamlining procedures to finding ways to focus more of criminalists' time on analytical activities. Some steps will, however, require additional funding to implement.

- **Using support staff to improve criminalists' productivity**—The crime lab should consider using lab technicians to increase the unit's productivity in both the alcohol and drug areas. Lab technicians currently conduct only non-analysis tasks such as purchasing supplies, maintaining the vehicle fleet, and removing biohazardous waste materials. Lab technicians do not, however, provide direct support to the criminalists during the analysis process, such as assisting in preparing the samples, repackaging specimens for return to the property and evidence unit, or performing initial drug screens.

To increase productivity, technicians could work along side criminalists to assist in such tasks. Although the crime lab raised concerns that this could affect their accreditation, an official from ASCLD/LAB (the agency that accredits crime labs) stated that many labs commonly use technicians to perform analysis and that this practice is acceptable if the technicians are properly trained and tested. Therefore, the crime lab should assess whether the current lab technician responsibilities can be revised or expanded to include such activities. While the lab may determine additional technicians would be needed to complete such tasks, the advantage would be that the lab could stretch its available personnel dollars since technicians have lower salaries than criminalists.

- **Streamlining data entry procedures**—In the near future, the crime lab should be able to reduce repetitive data entry. While the crime lab’s new automated laboratory information management system (LIMS) is designed to allow the downloading of information directly from lab equipment, the system currently does not have this capability. Instead, results already recorded in the lab equipment must be re-entered into the LIMS computer. The crime lab indicates that data transfer software will be available toward the end of the year at no cost.

- **Monitoring the technical review process to ensure timely final reports**—The crime lab should improve its monitoring of the required technical review process to ensure that final reports are disseminated as quickly as possible. A technical review involves another criminalist reviewing the test results before the final report is sent to the requesting agency. Although it takes between 2 to 4 hours to review a batch of 50 test results (depending upon the type of analyses performed), auditors noted that the number of toxicology cases awaiting review increased from 88 in February to more than 600 in July. This sizable increase could result in unnecessary delays if not managed well.

Currently, the lab allows criminalists to informally distribute the cases needing technical reviews. Because of this, the crime lab does not have adequate management information on the technical review process readily available, such as how long the process takes. Therefore, the lab should improve its monitoring of the technical review process in the short term by developing a system for tracking technical reviews, such as attaching a tracking sheet to each batch of results. The crime lab could compile and analyze these sheets to help assess how long technical reviews take, whether the review workload is being reasonably shared among criminalists, and whether any changes to the process are needed. Eventually, the lab should consider incorporating this information into its case management (LIMS) system.

- **Expanding blood alcohol testing services to all regional crime labs**—As a longer-term solution, the crime lab should consider expanding blood alcohol testing to both its northern

and southern regional crime labs. The central regional crime lab currently performs the State's drug testing and the majority of blood alcohol testing. This centralized approach can contribute to added time for court appearances, because criminalists who analyze these specimens must periodically travel across the State to testify. In addition, while local law enforcement officers submit evidence samples to the regional lab in their area, these samples are often transferred to the central lab for analysis. This shipping of samples to and from regional labs can also result in increased analysis time.

Such an expansion would require additional funding. Based on crime lab estimates, expanding blood alcohol testing to its northern and southern regional crime labs would result in increased staff (3 criminalists) and equipment costing a minimum of \$306,000. This amount might be even higher, because it does not include providing for any additional space, which is a consideration because the northern lab has already reached its space capacity. Therefore, before any expansion were to take place, its costs and benefits would need to be analyzed more extensively.

- **Enhance its action plan for reducing backlogs**—To improve its ability to address current and future backlog concerns, the crime lab should expand its written action plan specific to its toxicology area. While the toxicology unit's plan contains the number of backlogged cases and a discussion of steps it is taking to reduce this backlog, it does not identify how many cases individual criminalists can process or provide an updated time frame for when the backlog can be eliminated. In fact, the unit's current projected date for eliminating its backlog is January 1999. The crime lab explains that it currently projects these time frames and dates only informally and on an infrequent basis. Therefore, the crime lab should incorporate some additional items into its written action plan, such as performance goals that identify the number of cases the unit projects can be processed per month for each criminalist in the alcohol and drug analysis areas. In addition, the crime lab should formalize these projections as well as monitor and update them monthly. Furthermore, to facilitate the development of its plan, the lab should consider its entire workload, not just the cases the lab considers to be backlogged.

Recommendations

1. To increase the toxicology unit's productivity, the crime lab should formally assess whether lab technician responsibilities can be expanded to include providing direct support to the criminalist during the analysis process.
2. The crime lab should acquire software and related programming to allow direct transfer of case information from lab instruments to the crime lab's automated system.
3. To help ensure that the toxicology unit's final reports are disseminated as quickly as possible, the crime lab should develop a system for tracking how quickly reviews are completed.
4. The crime lab should formally analyze the cost benefit of expanding blood alcohol testing to the northern and southern regional crime labs.
5. The crime lab should enhance its written action plan for the toxicology unit by incorporating such items as the projected number of cases each criminalist can process per month as well as revising its projected dates for when backlogs can be eliminated in both the alcohol and drug areas.

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Appendices

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Appendix A**Department of Public Safety
Crime Lab
Forensic Science Services
As of July 2000**

Laboratory Specialty	Major Services Provided
Arson and explosives	<ul style="list-style-type: none">➤ Analyzes fire and explosive residues and debris to detect flammable liquids or explosives.
Breath alcohol	<ul style="list-style-type: none">➤ Trains officers in the use of breath testing instruments and quality assurance procedures; and➤ Calibrates, maintains, and repairs breath testing instruments.
Controlled substances	<ul style="list-style-type: none">➤ Analyzes materials and substances for presence of illegal drugs, such as marijuana or narcotics; and➤ Assists police investigating labs manufacturing clandestine drugs such as methamphetamine.
DNA	<ul style="list-style-type: none">➤ Analyzes blood, other bodily fluids, and tissues to create DNA profiles of convicted offenders and unknown suspects; and➤ Maintains the Combined DNA Identification System (CODIS), an automated database which contains DNA information on convicted sex offenders and selected unsolved crimes.
Firearms and toolmarks	<ul style="list-style-type: none">➤ Matches and identifies evidence items such as firearms, bullet cartridges, toolmarks and tire tracks; and➤ Restores serial numbers on crime scene evidence.
Latent prints	<ul style="list-style-type: none">➤ Develops latent (invisible) print impressions from surfaces such as metal, glass, and other objects;➤ Examines latent impressions such as fingerprints or palmprints to compare to suspect impressions; and➤ Searches crime scene latents against a computerized database (AZAFIS) when there are no suspect prints for comparison.
Photography	<ul style="list-style-type: none">➤ Processes film and reproduces slides or negatives from a crime scene; and➤ Assists with crime scene photography for major felonies.
Questioned documents	<ul style="list-style-type: none">➤ Examines and authenticates documents, such as wills, checks, and letters for genuineness, authorship, age or origin.
Toxicology	<ul style="list-style-type: none">➤ Identifies alcohol concentration in blood;➤ Identifies drug presence in blood, urine; and➤ Identifies inhalants and intoxicants in blood and urine.
Trace analysis	<ul style="list-style-type: none">➤ Examines, compares, and identifies hair, fibers, paint, glass and other articles from crime scenes and vehicle lamp filaments from traffic accidents.

Source: Auditor General staff analysis of the Department of Public Safety crime lab system *Overview and Annual Report*, August 10, 1999.

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Appendix B**Department of Public Safety
Crime Lab
Convicted Sex Offenders Subject to DNA Testing
As of July 2000**

A.R.S.	Offense Description	Conviction
13-1403	Public sexual indecency; public sexual indecency to a minor under age 15.	Public indecency—Class 1 misdemeanor; Public indecency to a minor—Class 5 felony.
13-1404	Sexual abuse of persons 15 years or more; any person under age 15 years if contact involves only the female breast.	Sexual abuse—Class 5 felony; Sexual abuse of person under age 15—Class 3 felony.
13-1405	Sexual conduct with a minor under age 15 or at least age 15.	Sexual conduct with a person under age 15—Class 2 felony; Sexual conduct with person at least age 15—Class 6 felony; Sexual conduct with person at least age 15, if offender is parent, stepparent, adoptive parent, legal guardian—Class 2 felony.
13-1406	Sexual assault.	Class 2 felony. Repeat offenders receive varied sentence terms.
13-1410	Molesting a child.	Class 2 felony.
13-1411	Crime against nature.	Class 3 misdemeanor.
13-1412	Lewd and lascivious acts.	Class 3 misdemeanor.
13-1417	Continuous (3 or more acts) sexual abuse of a child.	Class 2 felony.
13-3608	Incest.	Class 4 felony.
13-3821; 13-3822; 13-3824	Violating registration requirements for sex offender community notification.	Class 4 felony.

Source: Arizona Revised Statutes §31-281.

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Agency Response

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ARIZONA DEPARTMENT OF PUBLIC SAFETY

2102 WEST ENCANTO BLVD. P.O. BOX 6638 PHOENIX, ARIZONA 85005-6638 (602) P-23 - 2000



JANE DEE HULL
GOVERNOR

DENNIS A. GARRM
DIRECTOR

August 24, 2000

Ms. Debra K. Davenport, CPA
Auditor General, State of Arizona
Office of the Auditor General 2910
N. 44th Street
Phoenix, AZ 85018

Dear Ms. Davenport:

Enclosed is the Department's written response to the Auditor General's revised preliminary report draft of the performance audit of the Department of Public Safety's Scientific Analysis Bureau.

Please feel free to contact my office if you have any questions.

Sincerely,

A handwritten signature in cursive script, appearing to read "Dennis A. Garrett".

Dennis A. Garrett, Colonel
Director

dkr

Enclosures: Response Disk

AGENCY RESPONSE

INTRODUCTION

The Arizona Department of Public Safety, Scientific Analysis Bureau (Crime Laboratory), values the use of audits and inspections to create a culture of continual improvement. By using these and other techniques, the DPS Crime Laboratory has developed a national and international reputation for scientific excellence. Therefore, continuing in this tradition, the Scientific Analysis Bureau wishes to thank the Auditor General and staff for their recommendations and suggestions for improvement.

The DPS Crime Laboratory has been a leader in DNA analysis since the late 1980's when it was one of five crime laboratories in conjunction with the FBI to develop the initial DNA analysis techniques implemented in the United States.

Because, ultimately, all functions the DPS Crime Laboratory performs must withstand the scrutiny of the Arizona Criminal Justice System and be accepted in court, the Department believes the discussion included in the Audit Report under "Noteworthy Distinctions and Acknowledgments" is extremely important for inclusion in a document of this type. The Department would further provide the following information regarding the crime laboratory's scientific excellence. The DPS Crime Laboratory:

- was one of five crime laboratories in conjunction with the FBI to develop the initial DNA analysis techniques implemented in the United States in the late 1980's;
- was one of 12 laboratories in conjunction with the FBI to develop and validate the new STR - DNA analysis protocol now in use nationwide;
- has been a pilot site for the development of the national DNA database system CODIS (Combined DNA Index System) since the project was initiated by the FBI;
- is one of approximately six crime laboratories nationwide to determine the level of cannabis (marijuana) present in a blood sample and use physiological models to determine an approximate time-of-use in relation to impairment;
- is a member of the national Scientific Working Group on Firearms Examinations to set national standards in this forensic discipline;
- is a member of the national Scientific Working Group on Material Analysis Techniques to set national standards for trace evidence analysis; and
- has had numerous pieces of evidence sent to private laboratories for reanalysis by defense attorneys during its 31 years of existence, and never have the original DPS scientific conclusions been refuted.

RESPONSE TO FINDING 1: DNA DATABASE

The DPS Scientific Analysis Bureau is committed to the importance and power of DNA analysis to solve violent crimes; exonerate unjustly accused defendants; remove violent criminals from society; and resolve cases for victims and their families.

INTRODUCTION

The DPS Scientific Analysis Bureau is committed to the importance and power of DNA analysis to solve violent crimes; exonerate unjustly accused defendants; remove violent criminals from society; and resolve cases for victims and their families. This commitment is demonstrated by the laboratory's involvement in DNA from the beginning of DNA implementation in the United States as outlined in the "Response" introduction.

Therefore, the DPS Crime Laboratory has participated in an evolving DNA technology which has changed and grown considerably. Part of this growth or maturing process has been the CODIS system, which is just now moving from its beta testing to full national implementation in the Year 2000.

During this time, the DPS Crime Laboratory has worked diligently to apply its limited DNA resources to active cases where suspects can be implicated or exonerated, and to position itself so that the CODIS DNA database can become a valuable tool in solving crimes. However, the DPS Crime Laboratory joins the majority of states who have not had the resources to process a large number of non-suspect cases for comparison to the database of convicted offenders.

Even under these conditions, the DPS CODIS system has produced five "hits," which for the number of convicted offender samples received (approximately 768 per year) is the same "hit" ratio as Virginia (with 75 hits per 18,000 convicted offender samples per year). Virginia is reported in the audit document as a state having success with its database.

Recommendation 1: The crime lab should develop a strategic plan specific to the DNA database program's operations, addressing its analysis of both convicted offender samples as well as non-suspect crime scene evidence. At a minimum, this plan should define the DNA database program's mission and goals, and establish key objectives and performance measures for determining the program's efficiency and effectiveness.

Response: The finding of the Auditor General is agreed to and the audit recommendation will be implemented.

Recommendation 2: To improve the operation and management of its DNA database program, the crime lab should expand its current procedures. These expanded procedures should minimally focus on:

- a. Periodically assessing the amount of non-suspect crime scene evidence available for database comparison;
- b. Determining what non-suspect crime scene evidence the crime lab will analyze and upload to the DNA database;
- c. Prioritizing its analysis of non-suspect crime scene evidence; and
- d. Improving coordination with agencies responsible for submitting convicted offender samples to ensure submitting agencies are aware of the importance of submitting all samples and that they are submitted with accurate and complete identifying information.

The DPS Crime Lab has received on August 23, 2000, approval for a federal grant of \$201,250 to outsource an additional 5,000 convicted offender samples.

Response: The finding of the Auditor General is agreed to and the audit recommendation will be implemented. This may require an administrative position to accomplish and if this is determined to be the case, it will be included in new DNA program Budget Requests currently being developed.

Recommendation 3: The crime lab should continue in its efforts to reduce and prioritize its convicted offender backlog. Specifically, the crime lab should:

- a. Seek opportunities to increase its outsourcing of offender samples to enable the DNA unit to concentrate on analyzing more non-suspect crime scene evidence;
- b. Develop effective procedures of ensuring that technical reviews are completed as quickly as possible; and
- c. Revise current prioritization practices in consideration of present and future offenses subject to DNA testing.

Response: The finding of the Auditor General is agreed to and the audit recommendation will be implemented. The DPS Crime Lab has just received on August 23, 2000, approval for a federal grant of \$201,250 to outsource an additional 5,000 convicted offender samples.

Recommendation 4: The crime lab should dedicate one or more criminalists to the specific responsibility of analyzing non-suspect crime scene cases.

Response: The finding of the Auditor General is agreed to and the audit recommendation will be implemented within the constraints of court requirements and active cases. The Scientific Analysis Bureau is actively seeking opportunities to outsource convicted offender samples, enabling DNA analysts to be assigned to non-suspect cases on a rotating basis. However, if outsourcing does not continue due to lack of funds, etc., then DNA analysts may have to be reassigned from non-suspect cases to active cases set for court.

Recommendation 5: In conjunction with developing procedures and reducing its offender sample backlog, the crime lab needs to regularly assess whether it has resources to effectively implement the DNA database program, and develop a request for additional staff and equipment if necessary.

Efforts are currently underway by the DPS Crime Lab, a judge, county attorneys, and a Governor's Office representative to assess DNA database needs statewide and recommend funding requirements.

Response: The finding of the Auditor General is agreed to and the audit recommendation will be implemented. DPS Scientific Analysis Bureau management is currently meeting with a group of prosecutors, a judge, a member of the Governor's staff, and local crime lab administrators to assess funding requirements for non-suspect cases and an expansion of the convicted offender database. This project is anticipated to result in new legislation to increase resources for the entire DNA database needs with specific emphasis on non-suspect cases.

RESPONSE TO FINDING 2: TOXICOLOGY BACKLOG

INTRODUCTION

The DPS Scientific Analysis Bureau places the highest priority on speedy delivery of laboratory results of unquestionable accuracy. Because of the sudden surge in new toxicology submissions over the last year, backlogs of blood alcohols and drug screens have grown, impacting turnaround times.

The Auditor General's Report depicts this significant increase and efforts to combat the backlogs. In addition, it should be noted that the DPS Crime Laboratory has successfully applied for and received a Governor's Office of Highway Safety Grant to hire an additional toxicologist. This, along with a vacant position moved to the toxicology unit, will add two additional staff.

The DPS Crime Lab, as of August 28, 2000, will bring on board two experienced toxicologists to assist with backlog reduction.

And finally, through a careful hiring process, the laboratory was able to hire two experienced toxicologists to fill these positions beginning August 28, 2000, and they will begin reducing the backlogs almost immediately.

Also, beginning in July 2000, the Scientific Analysis Bureau has directed new fiscal year overtime funds toward impacting and reducing backlogs. Therefore, as of August 16, 2000, the backlog of blood alcohols had dropped by over 440 cases. (The auditors noted in their report that cases awaiting review had grown to 600 cases in July, which is a result of this important overtime program.)

Recommendation 1: To increase the toxicology unit's productivity, the crime lab should formally assess whether lab technician responsibilities can be expanded to include providing direct support to the criminalist during the analysis process.

Response: The finding of the Auditor General is agreed to and the audit recommendation will be implemented. It should be noted that any direct support by lab technicians, as a result of this assessment, would then take the technicians away from their normal duties. This would mean that these normal duties would have to be assumed by criminalists, or budget authority would have to be received to hire more technicians.

Recommendation 2: The crime lab should acquire software and related programming to allow direct transfer of case information from lab instruments to the crime lab's automated system.

Response: The finding of the Auditor General is agreed to and the audit recommendation will be implemented. The new Laboratory Information and Management System software revision scheduled for release prior to December 31, 2000, has the appropriate features to accomplish this direct transfer of case information.

Recommendation 3: To help ensure that the toxicology unit's final reports are disseminated as quickly as possible, the crime lab should develop a system for tracking how quickly reviews are completed.

Response: The finding of the Auditor General is agreed to and the audit recommendation will be implemented. In actuality, this recommendation has already been implemented. A tracking sheet is in use and the LIMS system provides turnaround time statistics.

The FY 2002 and FY 2003 Budget Request includes personnel and equipment to perform blood alcohol analysis at the Tucson and Flagstaff Regional Crime Laboratories.

Recommendation 4: The crime lab should formally analyze the cost benefit of expanding blood alcohol testing to the northern and southern regional crime labs.

Response: The finding of the Auditor General is agreed to and the audit recommendation will be implemented. The cost/benefit analysis of regionalizing blood alcohol analysis has already begun. The FY 2002 and FY 2003 Budget Request includes personnel and equipment to perform blood alcohol analysis at the Southern Regional Crime Laboratory, Tucson, and the Northern Regional Crime Laboratory, Flagstaff.

Recommendation 5: The crime lab should enhance its written action plan for the toxicology unit by incorporating such items as the projected number of cases each criminalist can process per month, as well as revising its projected dates for when backlogs can be eliminated in both the alcohol and drug areas.

Response: The finding of the Auditor General is agreed to and the audit recommendation will be implemented. Case processing capabilities for toxicologists have been well established and monitored at the crime laboratory for years. With the new personnel hired August 28, 2000, new projections of backlog elimination can be calculated.

Other Performance Audit Reports Issued Within the Last 12 Months

99-13	Board of Psychologist Examiners	00-1	Healthy Families Program
99-14	Arizona Council for the Hearing Impaired	00-2	Behavioral Health Services— Interagency Coordination of Services
99-15	Arizona Board of Dental Examiners	00-3	Arizona's Family Literacy Program
99-16	Department of Building and Fire Safety	00-4	Family Builders Pilot Program
99-17	Department of Health Services' Tobacco Education and Prevention Program	00-5	Department of Agriculture— Licensing Functions
99-18	Department of Health Services— Bureau of Epidemiology and Disease Control Services	00-6	Board of Medical Student Loans
99-19	Department of Health Services— Sunset Factors	00-7	Department of Public Safety— Aviation Section
99-20	Arizona State Board of Accountancy	00-8	Department of Agriculture— Animal Disease, Ownership and Welfare Protection Program
99-21	Department of Environmental Quality—Aquifer Protection Permit Program, Water Quality Assurance Revolving Fund Program, and Underground Storage Tank Program	00-9	Arizona Naturopathic Physicians Board of Medical Examiners
99-22	Arizona Department of Transportation A+B Bidding	00-10	Department of Agriculture— Food Safety and Quality Assurance Program and Non-Food Product Quality Assurance Program
		00-11	Arizona Office of Tourism

Future Performance Audit Reports

Department of Agriculture—Pest Exclusion and
Management Program

Department of Agriculture—Commodity Development and
Promotion Program

Department of Agriculture—State Agricultural Laboratory

Department of Agriculture—Sunset Factors

Arizona State Boxing Commission