2002 & 2005 Census of Publicly Funded Forensic Crime Laboratories

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National Academy of Sciences Committee on
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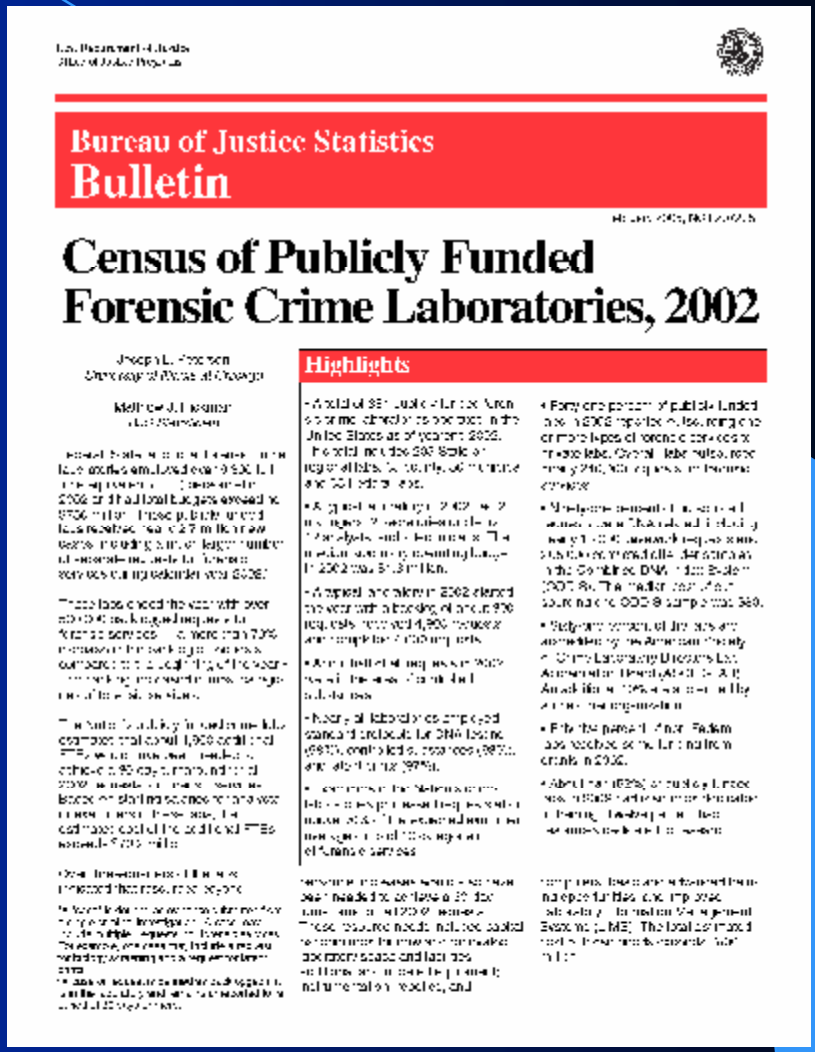
Bureau of Justice Statistics (BJS)

- BJS (est. 1979) - The statistical arm of the U.S. Department of Justice
- Analyzes the operations of over 50,000 agencies, offices, courts and institutions within the justice system
- Mission: collect, analyze, and disseminate information on crime, offenders, victims, and operation of the criminal justice system

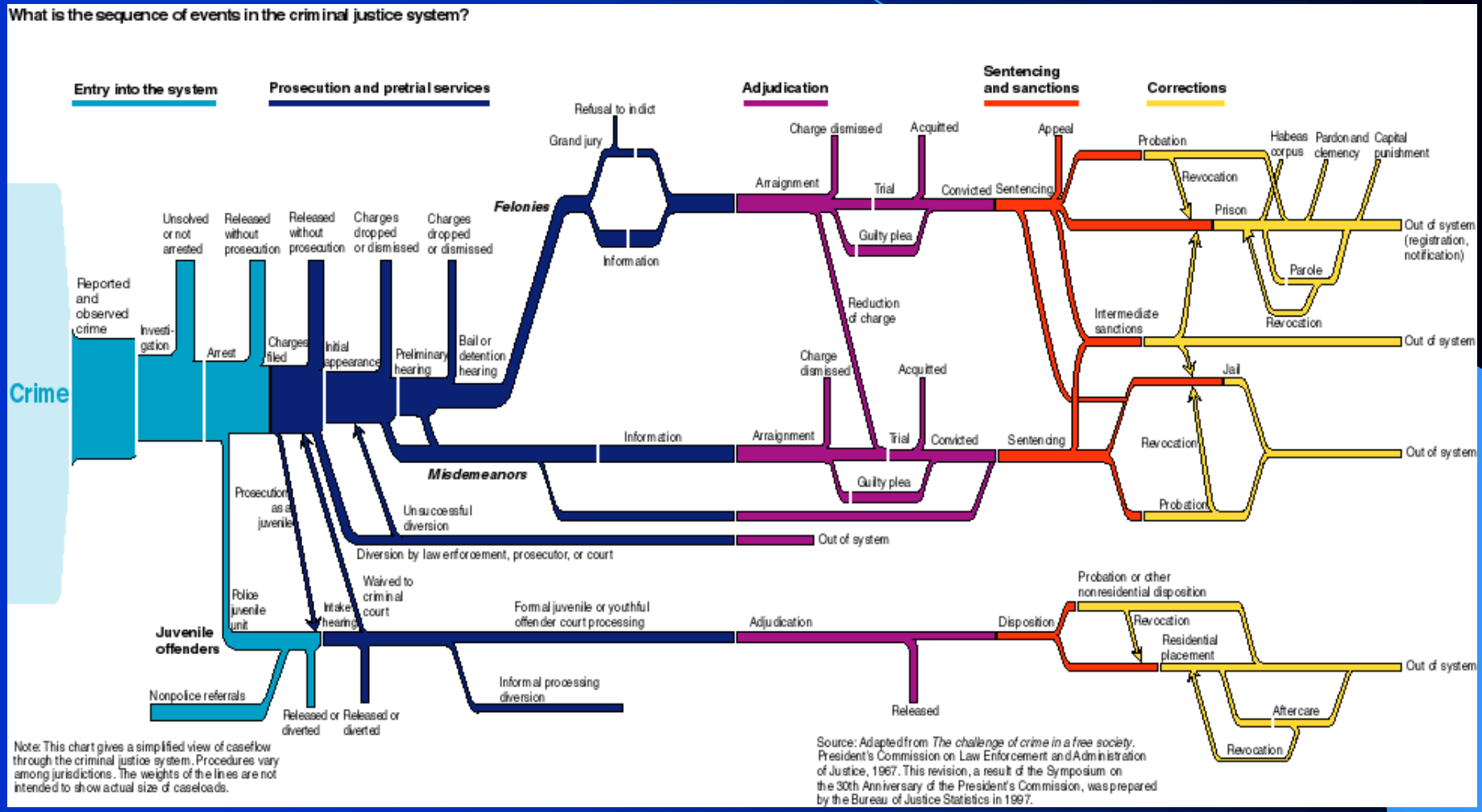


Bureau of Justice Statistics
Bulletin

Census of Publicly Funded Forensic Crime Laboratories, 2002

Highlights

BJS Data Coverage



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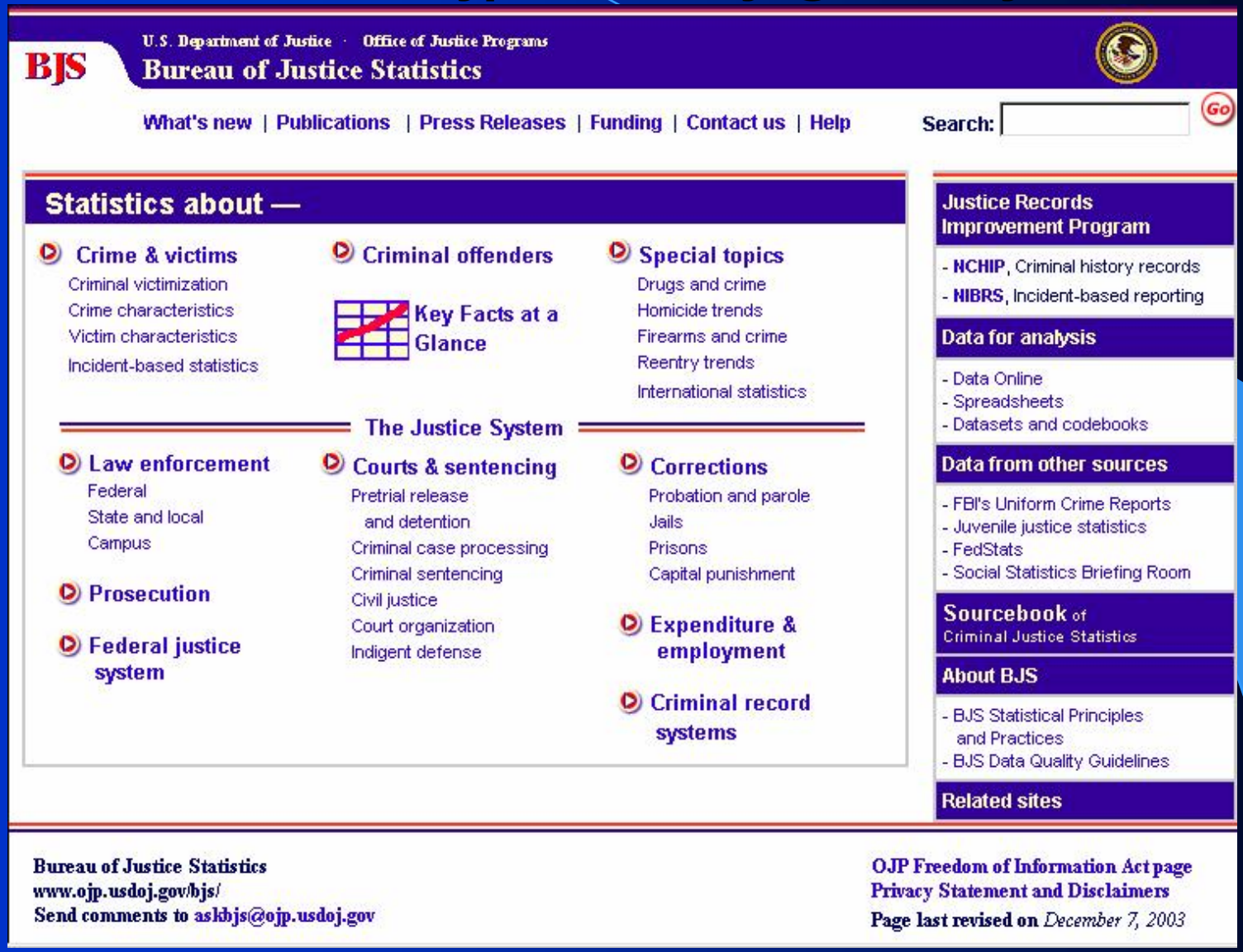

Growing forensics portfolio at BJS

- DNA laboratories
- Forensic crime laboratories
- Medical examiners and coroners' offices

Impact of 2002 Crime Lab Census

- Study results were reviewed, discussed, and acted upon in FY 2006 Senate Appropriations (CJS):
  - "The report identifies that the backlog in forensic science labs is not limited to DNA. In fact, these studies demonstrate a disturbing trend of increased cases and increased backlog in all disciplines of forensic science."
  - "Based on the study's findings, the budget should allocate funds to all disciplines as opposed to just one."
  - "The results of these studies are indicative of a larger problem within the forensic science and legal community: the absence of data."
- This NAS Committee was funded as part of the Congressional response to these studies

Background for the Crime Laboratory Census

Need for Standardized Crime Laboratory Management Data

- Baseline information about workload and operations of US forensic crime labs
  - Resources devoted to forensic analysis
  - Budget vs. workload demand
  - Operations and standards of laboratories
  - Four-fold increase in crime labs over last forty years
- Data must be collected on a regular basis to assess growth, responses, and future needs

Objectives of Crime Laboratory Census & Survey

- Identify and survey all publicly funded crime laboratories in the United States
- Determine resource allocation to laboratories, workload demands, and analytical productivity
- Document existence of technical and resource needs amongst laboratories

Survey Methods

- BJS awarded grants to University of Illinois at Chicago for 2002 Census, and Sam Houston State University for 2005 Census
- BJS provided overall guidance and subcontracts were made with ASCLD and NFSTC to provide technical expertise and professional liaison
- Advisory committee assisted in development of the survey, creation of laboratory mailing lists, and assistance in securing responses

Survey Categories

- Organization
  - Type of laboratory
  - Functions that it performs
- Budget
  - Resources
  - Expenditures
- Staff
  - Number of employees
  - Salary ranges
- Workload
  - Demands
  - Requests Completed
  - Backlog
- Outsourcing
  - Use of private labs
- QC/QA, Research & Training
  - Accreditation
  - Proficiency Testing
  - Research & Training

Definition of Crime Laboratory

- A laboratory which employs *one or more full time scientists* whose principal function is the examination of physical evidence for law enforcement agencies and that provides reports and testimony to courts of law with respect to such evidence

Definition of a Scientist

- A person with a minimum of a bachelor's degree in a natural science who employs scientific methods in the examination and interpretation of evidence in a crime laboratory

Census of Publicly Funded Crime Laboratories 2002

Achievement of Project Goals

- Initial mailing of 430 surveys in August 2003
- Mailing list reduced to 351 institutions meeting definition of a crime laboratory
- 281 laboratories completed full survey (80%)
- 25 additional laboratories completed short survey
- 306 total laboratories completed surveys for overall response rate of 87%

Data Imputations

- Among responding laboratories, missing data imputations were made for personnel, budgets, and evidence processing data
- Imputations are based largely on mean/median percentages of authorized personnel for labs of similar size and type, offering similar services

Survey Results In a Nutshell

We identified:

- 351 public crime laboratories
- Employing 9,300 FTE personnel
- Having budgets exceeding $750 million
- Completing 2.5 million scientific requests
- Having 500,000 backlogged requests yearend

Workload and Backlog

- Laboratories began 2002 with almost 290,000 backlogged requests for service
- During the year, laboratories received more than 2.7 million requests for analysis
- During the year, laboratories completed almost 2.5 million requests for analysis
- At year end, laboratory backlog *increased* ***more than 70%*** to 500,000 requests

Backlog (detail)

- Almost 50% of the total backlog – 232,000 requests - was attributable to controlled substance identification
- Almost 20% of the backlog was due to latent print examinations
- Less than 10% of the backlog was due to DNA analyses

Backlog (detail)

- Overall, for every five requests completed by labs in 2002, one request was outstanding at yearend
- For controlled substances, the same 5:1 ratio holds, but for latent prints it is 3:1
- But, for DNA requests, for every 5 requests completed, about 6 remained outstanding at yearend

Table 1. Requests for forensic services and estimated yearend backlog in the Nation's publicly funded forensic crime laboratories, by type of function, 2002

Type of function	Back-logged requests as of January 1, 2002		New requests received during 2002		Requests completed in 2002		Estimated back-logged requests at yearend	
	Total	Median	Total	Median	Total	Median	Total	Median
Total	289,938	394	2,706,785	4,892	2,495,313	4,559	501,410	646
Controlled substances	95,404	171	1,291,488	3045	1,154,221	2,822	232,671	294
Biology screening	18,456	66	88,857	381	76,332	332	30,981	102
Firearms/toolmarks	22,636	43	104,068	290	88,997	240	37,707	65
Crime scene	1,579	0	166,588	65	165,461	53	2,706	1
Latent prints	50,245	119	274,225	860	238,135	786	86,335	140
Trace	9,997	30	41,531	132	36,878	124	14,650	40
DNA analysis	29,516	72	60,887	246	41,592	172	48,811	131
Toxicology	17,523	30	467,752	1,541	455,624	1,457	29,651	51
Questioned documents	3,391	23	16,683	131	15,562	123	4,512	27
Computer crimes	952	20	2,839	49	2,757	45	1,034	34
Other functions	40,239	12	191,867	165	219,754	107	12,352	21

Note: Examples of forensic services listed by labs in 'other functions' category include fire debris, polygraph, shoe/tire print, and digital imaging. Backlog data should be interpreted with caution for a variety of reasons. First, some laboratories may not have included pending requests that had been logged in December of the year prior to the reference period, but were not yet 30 days old. As such, backlogged requests may represent a subset of total pending requests for some laboratories. Second, in State laboratory systems requests may occasionally be moved between laboratories, with the initial request being logged at one laboratory and the completion at another laboratory. Third, some complex cases may start with an inititial request and evolve into multiple requests. The additional work may be completed without logging additional requests. Finally, data were imputed for labs that did not provide complete forensic request processing information.

Resource Needs

- Overall, labs estimated an added 1,900 FTEs ($70M) would be needed to achieve 30-day turnaround for all requests received in 2002
- Greatest costs are in DNA testing, followed by controlled substances and latent prints
- $500 million more in additional resources (lab space & facilities, equipment, computers, etc.)

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Office of Justice Programs

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Census of Publicly Funded Forensic Crime Laboratories, 2002

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Federal, State, and local forensic crime laboratories employed over 9,300 full-time equivalent (FTE) personnel in 2002 and had total budgets exceeding $750 million. These publicly funded labs received nearly 2.7 million new cases, including a much larger number of separate requests for forensic services during calendar year 2002.[1]

These labs ended the year with over 500,000 backlogged requests for forensic services — a more than 70% increase in the backlog of requests compared to the beginning of the year.[2] The backlog increased in most categories of forensic services.

The Nation's publicly funded crime labs estimated that about 1,900 additional FTEs would have been needed to achieve a 30-day turnaround for all 2002 requests for forensic services. Based on starting salaries for analysts or examiners in these labs, the estimated cost of the additional FTEs exceeds $70.2 million.

Over three-quarters of the labs indicated that resources beyond personnel increases would also have been needed to achieve a 30-day turnaround on all 2002 requests. These resource needs included capital expenditures for new and renovated laboratory space and facilities; additional and updated equipment; instrumentation, robotics, and computers; basic and advanced training opportunities; and improved Laboratory Information Management Systems (LIMS). The total estimated cost of these needs exceeds $500 million.

[1] A "case" is defined as evidence submitted from a single criminal investigation. A case may include multiple "requests" for forensic services. For example, one case may include a request for biology screening and a request for latent prints.

[2] A case or request is defined as backlogged if it is in the laboratory and remains unreported for a period of 30 days or more.

Highlights

- A total of 351 publicly funded forensic crime laboratories operated in the United States as of yearend 2002. This total includes 203 State or regional labs, 65 county, 50 municipal, and 33 Federal labs.
- A typical laboratory in 2002 had 2 managers, 2 secretaries or clerks, 12 analysts, and 2 technicians. The median laboratory operating budget in 2002 was $1.3 million.
- A typical laboratory in 2002 started the year with a backlog of about 390 requests, received 4,900 requests, and completed 4,600 requests.
- About half of all requests in 2002 were in the area of controlled substances.
- Nearly all laboratories employed standard protocols for DNA testing (98%), controlled substances (98%), and latent prints (97%).
- Examiners in the Nation's crime laboratories processed requests at or above 90% of the expected examiner averages in 8 of 10 categories of forensic services.
- Forty-one percent of publicly funded labs in 2002 reported outsourcing one or more types of forensic services to private labs. Overall, labs outsourced nearly 240,000 requests for forensic services.
- Ninety-one percent of outsourced requests were DNA-related, including nearly 13,000 casework requests and 205,000 convicted offender samples in the Combined DNA Index System (CODIS). The median cost of outsourcing one CODIS sample was $30.
- Sixty-one percent of the labs are accredited by the American Society of Crime Laboratory Directors Lab Accreditation Board (ASCLD-LAB). An additional 10% are accredited by some other organization.
- Fifty-five percent of non-Federal labs received some funding from grants in 2002.
- About half (52%) of publicly funded labs in 2002 had resources dedicated to training. Twelve percent had resources dedicated to research.

Census of Publicly Funded Crime Laboratories 2005

Goals of 2005 Census (Nearing Completion)

- Compilation of bona fide crime laboratories list
- Verification of names, addresses, telephone and email contacts
- Refinement of 2002 survey instrument
- Greater emphasis on electronic (CD) replies
- Twenty pretest laboratories
- Mailing to 393 crime laboratories (5-26-06)

Electronic Survey Option

- CD “Flash” technology enabled labs to respond directly to Sam Houston State server
- Laboratories could also log on to project’s website
- Labs experiencing technical (e.g., firewall) problems could submit paper copy (mail/fax)
- Technical assistance offered to all labs
- Approx two-thirds of returns are electronic

U.S. DEPARTMENT OF JUSTICE,
BUREAU OF JUSTICE STATISTICS

2005 CENSUS OF PUBLICLY FUNDED FORENSIC CRIME LABORATORIES

OMB No. 1121-0269: Approval Expires 01/31/2009

To those completing this form:

Please complete the User Information page, it is important to **identify both yourself and your laboratory**. Then complete all other pages making sure to clearly record your responses to each item in the spaces provided.

Thank you for your assistance.

This page does NOT appear in the electronic version.

Instructions

All respondents have been provided with a "hard copy" of the census form as well as a CD containing an electronic version of the same form.

We prefer you transmit your data back to us through one of the electronic means offered; however, the important thing is that we receive your information, so if it's easier to complete the form using one of the "hard copy" processes listed, please do so!

Some of you may want to collect the required information on the hard-copy form before entering the data on the electronic version. Others will enter data directly into the electronic version.

There are four ways to complete this census form:

1. ELECTRONIC TRANSMISSION - Answers to questions entered on the form can be submitted directly to our data set at Sam Houston State University (SHSU) through a connection to the internet. If you choose to complete the census electronically, simply insert the enclosed CD into your computer. The program should automatically start, but if it does not, double click on the file on the CD named "BJSCensus.exe" for a Windows-based computer, or "BJSCensus.hqx" for a Macintosh. An online version of the form is also located at "158.135.21.213/FLCensus/BJSCensus.htm" which may also be used. The online version will likely require downloading the free Flash 8 player from Macromedia.

Please note that data entered into the electronic the form is **automatically sent** to our data server as it is entered. There is no submit button and less chance for lost data.

Continued on the next page

Organization

7. Please indicate if your crime laboratory performs the following forensic functions (including specific sub-categories where requested). Where appropriate, also note the number of entries/searches your lab made to CODIS, NIBIN and AFIS during 2005, plus the number of "hits" for each category (see Glossary). If none, entry N/A in the appropriate boxes.

Yes

- ☐ **Controlled substances**
- ☐ **Toxicology (General)**
  - ☐ **BAC Only**
  - ☐ **Antemortem**
  - ☐ **Postmortem**
- ☐ **Trace (General)**
  - ☐ **Gunshot residue testing**
  - ☐ **Hair/fiber examination**
  - ☐ **Fire debris Analysis**
- ☐ **Biology screening**
- ☐ **DNA analysis**
- ☐ **Firearms/toolmarks**
- ☐ **Computer crimes**
- **Latent prints**
- ☐ **Questioned documents**
- ☐ **Impressions (General)**
  - ☐ **Footwear**
  - ☐ **Tire-tread**
- ☐ **Crime scene**

DNA analysis:
- ☐ Number CODIS Profile Searches
- ☐ Number of 'Hits'

Firearms/toolmarks:
- ☐ Number NIBIN Entries/Searches
- ☐ Number of 'Hits'

Latent prints:
- ☐ Number AFIS Individual Latent Searches
- ☐ Number of 'Hits'

Budget

9a. Please indicate approximate total budgeted amounts dedicated to each of the following areas during the most recent full budget year. Budgeted amounts should add up to the total provided in Question 8. These are the same budget categories used in Federal OJP Grant Applications; please consult the attached Glossary, or review your OJP Grant Budget Manual.

a. Personnel	$	.00
b. Fringe Benefits	$	.00
c. Travel	$	.00
d. Equipment	$	.00
e. Supplies	$	.00
f. Construction	$	.00
g. Consultants/Contractors	$	.00
h. Indirect Costs	$	.00

i. Other (Please specify on the next page)

9b. Please indicate what percent of your laboratory's funding came from each of the following sources during the most recent full budget year. Percents should total 100. IF YOUR LAB RECEIVED NO FUNDING FROM A LISTED SOURCE, PLEASE INDICATE "0."

a. Federal		%
b. State		%
c. Local		%
d. Grants		%
e. Fees		%

f. Other. (Please specify on the next page)

Workload

In the tables that follow we are asking for 7 different elements of information about each of the disciplines and sub-disciplines associated with forensic laboratories (listed below).

For the Toxicology, Trace, and Impressions Disciplinary Areas listed below we have both General and specific Subcategories. The request totals for each of the General categories (e.g., Trace) should include the requests for the various subcategories (Gunshot Residue, Hair/Fiber, and Fire Debris).

A single case may result in multiple requests; e.g., one case may include: a request for biology, AND a request for latent prints. The single request for biology may include multiple items to be analyzed for biological fluids.

The 7 different elements of information include:

a. Total number of all pending requests awaiting analysis as of Jan. 1, 2005;
b. Number of these pending requests that were backlogged (requests held for 30 days or longer) as of Jan. 1, 2005;
c. Total number of new requests received in 2005;
d. Total number of requests completed in 2005;
e. Number of FTE's it took to complete the requests (as reported in item d);
f. Number of additional FTE's you would have needed to achieve a 30 day turnaround on all 2005 requests (as reported in item c);
g. Estimated cost of new equipment needed to achieve a 30 day turnaround on all 2005 requests, as reported in item c.

PLEASE ENTER A RESPONSE IN EVERY CELL IN EACH TABLE.
IF THERE WERE NO CASES IN A PARTICULAR CATEGORY, PLEASE ENTER "0." IF NOT APPLICABLE TO YOUR LAB, PLEASE ENTER "NA."

Workload

17. Specifically, for DNA testing, what types of requests were completed in house (not outsourced) in 2005? Please specify how many of each of the following types of DNA requests were completed in 2005. **Note that the total number of tests reported here should equal the sum of all types of DNA requests reported in Question 16 F.**

Type of DNA requests	
17a. No suspect requests	
17b. Requests with suspects	
17c. Convicted offender/database requests	
17d. Other	
Total	

Outsourcing

18. Did your lab **outsource** the testing of any type of evidence or samples for analysis in 2005?

yes no

19. This table lists the types of requests that laboratories typically outsource. For each type, please report the number of requests your lab outsourced in 2005, the cost of outsourcing, the internal FTEs used for outsourcing, and the source of funding that covered the costs associated with outsourcing.

PLEASE ENTER A RESPONSE IN EVERY CELL. PLEASE ENTER "0" FOR NONE. IF AN ITEM IS NOT APPLICABLE, PLEASE ENTER "NA."

2005 outsourcing	# Requests	Cost	Internal FTEs Used	% Funds From Federal	% Funds From State
TYPE OF REQUEST					
1. Controlled Substances		$ .00		%	%
2. Toxicology		$ .00		%	%
3. DNA (casework)		$ .00		%	%
4. CODIS (data-basing)		$ .00		%	%
5. Other	(Please specify on the following page)				
6. TOTAL		$ .00			

Census Issues

- Police ID units were removed from list
- Workload terminology (requests) not uniform
- LIMS systems don’t capture needed data
- Some state systems lack individual lab data
- Budgetary information problematic
- Federal laboratories lowest response rate
- Occasional technical (server) glitches
- Data cleaning a major task

Census Data Collection Now Complete

- Goal has been 95%+ response rate
- Extensive data cleaning and verification
- Many follow-up emails and telephone calls made by advisory committee
- ASCLD and NFSTC critical team members
- Process to be discussed at 2007 AAFS meeting; results to be released later this year