OSBM

DEPARTMENT OF JUSTICE

Cost Study of DNA Testing and Analysis

As Directed by Session Law 2005-276, Section 15.8

March 1, 2006

Prepared By:

Office of State Budget and Management

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INTRODUCTION

Scope

Section 15.8 of Session Law 2005-276 directed that the Office of State Budget and Management (OSBM), in consultation with the Department of Justice, study the cost of testing and analyzing DNA samples at the State Crime Laboratory. The study shall include the following:

- A determination of the unit cost for analyzing a rape kit and a comparison of the cost with the unit cost for the same analysis when performed by other laboratories, both public and private,
- A comparison of the amount of funds and length of time required to eliminate the backlog of rape kits using private laboratories versus the SBI crime laboratory, and
- A survey of the funding sources used by other states for their DNA testing and analysis laboratory costs.

Methodology

To comply with the legislative requirements, OSBM performed the following:

- Examined organizational charts for the Crime Laboratory's Forensic Biology section,
- Flowcharted the processes within the Forensic Biology section,
- Conducted a time study for major processes related to testing and analysis of DNA including Evidence Control from October 14, 2005 through December 2, 2005,
- Examined budgetary and financial documents,
- Allocated Crime Lab expenditures to the Forensic Biology unit,
- Identified the number of completed cases, backlog and convicted offenders samples within the Forensic Biology section,
- Examined DOA Purchase and Contact vendor bid file for outsourcing no suspect rape kits,
- Identified processing cost and turnaround times at private laboratories,
- Identified laboratory equipment and compiled depreciation cost,
- Compiled personnel costs for Forensic Biology,
- Conducted a survey of other states' crime laboratories, and
- Researched the Internet for additional information on other states' funding sources.

BACKGROUND

Operations

Table 1
SBI Laboratories and Sections

Section	Raleigh Lab	Western Lab
Document and Digital Evidence	✓	
Drug Chemistry & Toxicology	✓	✓
Evidence Control	✓	
Fire and Tool Marks	✓	
Forensic Biology	✓	
Latent Evidence	✓	✓
Trace Evidence	✓	

The State Bureau of Investigation (SBI) maintains two crime laboratories, a full-service laboratory in Raleigh and a regional laboratory in Asheville. Table 1 shows the sections which provide services at both laboratories. Services at the laboratories are provided free of charge to any public law enforcement agency in North Carolina including local, state, federal, military, and railroad police organizations. DNA testing and analysis is conducted by the Forensic Biology section of the Crime Laboratory. This section consists of three units:

- Body Fluid Unit: responsible for examining evidence for the presence of blood, other body fluids, tissue, and other related biological materials. Approximately 35% of evidence does not contain human biological materials;
- DNA Unit: responsible for extracting DNA from the samples and comparing the DNA samples with the DNA of the victim and suspect(s). Unknown suspect samples can be run through the State's DNA

database which is part of the national database, Combined DNA Index System (CODIS), to identify a suspect; and

- DNA Database Unit: responsible for analyzing all convicted offender samples and uploading the data to CODIS which currently contains more then 68,000 DNA profiles.

Workflows for processing DNA are shown in Exhibit 1. Forensic Biology also manages the Sexual Assault programs, which includes preparation and distribution of Sexual Assault and Suspect Evidence Collection Kits and the training of medical and law enforcement personnel. In addition to these responsibilities, employees may be requested to assist at a crime scene conducting luminol analysis (detecting non-visible blood) and bloodspatter interpretation, and discuss casework with law enforcement and district attorneys, including testifying in court.

Exhibit 1

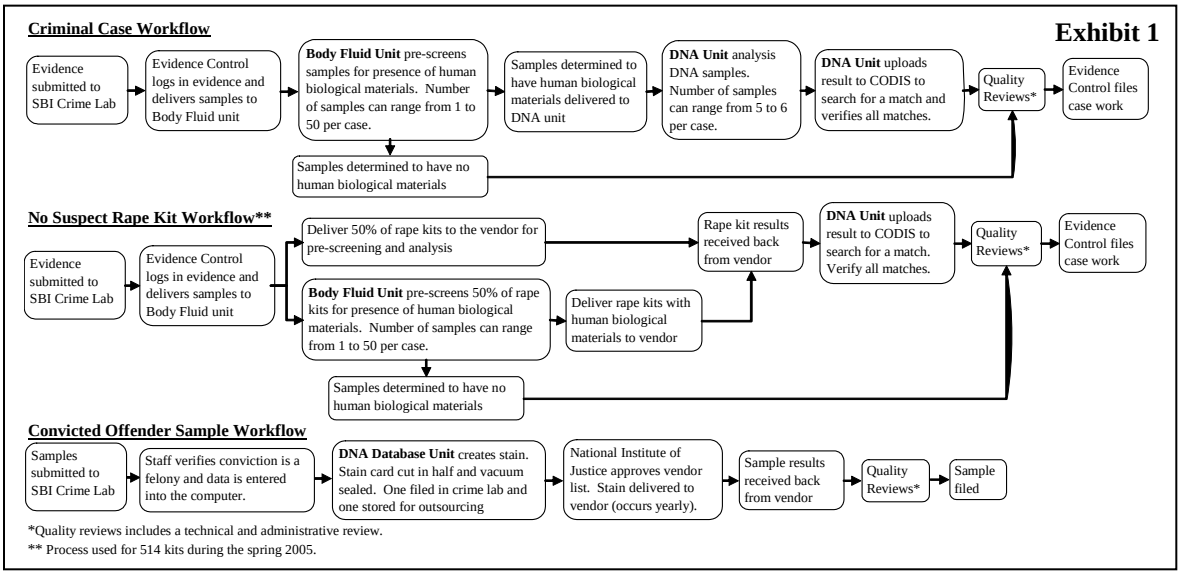
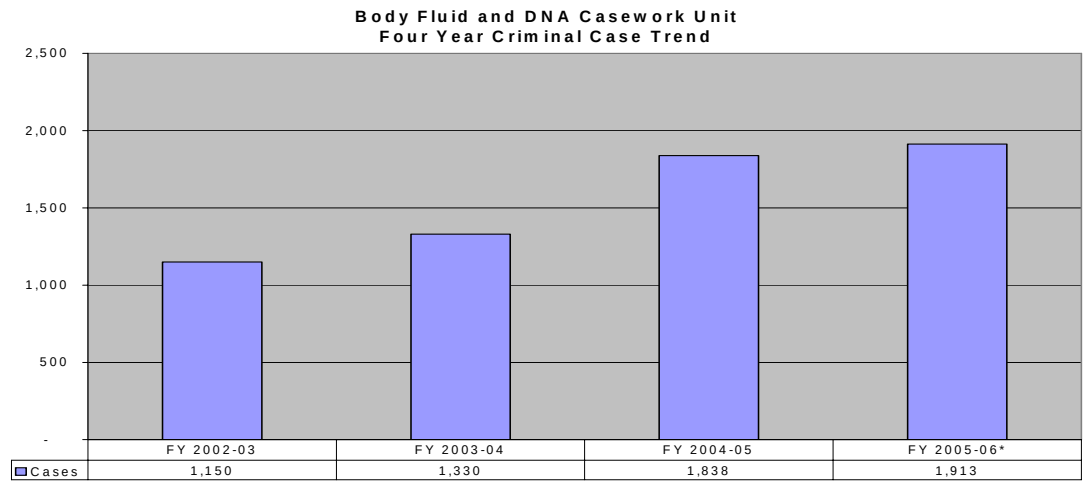


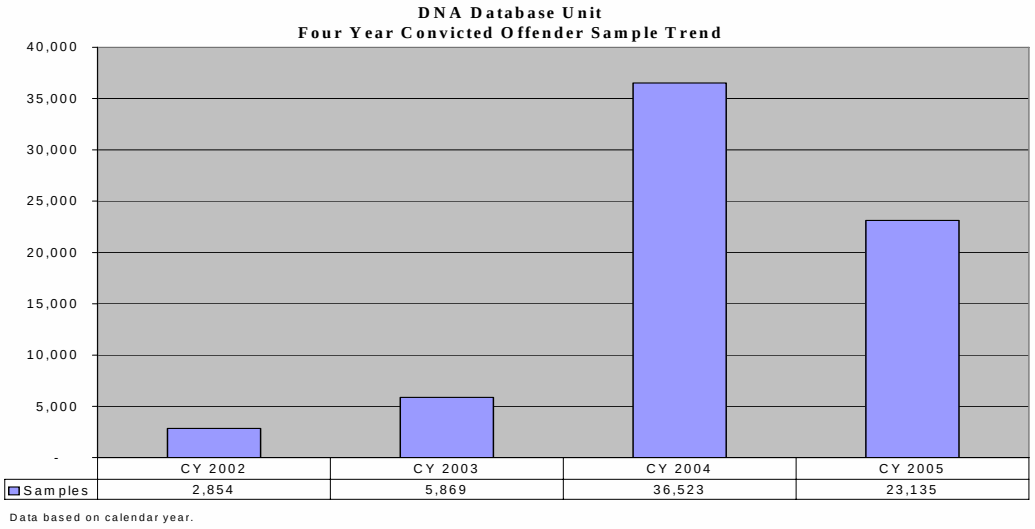
Chart 1 reveals a 66% increase in the number of cases completed by the Body Fluid and DNA Casework units over the last four years. Body Fluid processed 1,206 and DNA Casework completed 632 for a total of 1,838 cases. During FY 2004-05 the crime lab changed its DNA processing method which decreased the amount of time for completing the DNA extraction process. In addition to this change, position increases as shown in Chart 3, on page 4, have allowed the crime lab to process more cases each year.

Chart 1



The DNA Database unit had a 711% increase in the number of convicted offender samples submitted to the lab over the last four years as shown in Chart 2. The large spike in samples in 2004 is due to amendments to G.S. 15A-266.4 ratified in December 2003. The new law required DNA samples from all convicted felons, instead of only convictions for 22 different felony charges, and was retroactive requiring samples from all incarcerated felons sentenced prior to December 2003. During 2004, samples were collected from newly convicted felons and all felony prisoners in county jails or the state prison system. The reduction in 2005 samples is due to the need to only collect samples from newly convicted offenders.

Chart 2



There has been a national issue with increasing DNA workload at crime laboratories across the county. Some of this is due to changes to convicted offender laws. At a minimum, all States require DNA samples from sex offenders. Thirty-nine states, including North Carolina, require samples from all convicted felons and the DNA results become part of CODIS. This has created a large nationwide database which enables law enforcement to solve crimes by searching the database. Prior to the nationwide database, if a case had no suspect the DNA would not be processed since there was nothing to compare the result to. Now, all cases can be processed and cases with no suspect can be uploaded for a nationwide search. This change has created larger workloads for all state crime laboratories, including North Carolina. To address this issue, the SBI entered into a contract in March 2005 with a private laboratory and by May 2005 a total of 514 no suspect rape kits were submitted to the contractor. The contract was established with a 50% to 50% processing split. Half of the kits would be pre-screened by the SBI Crime Lab's Body Fluid unit and the kits with human biological materials would be forwarded to the contractor for completion. The other half would require the contractor to screen and process the rape kits. Table 2 shows after seven months 44.2% of the kits have been completed and returned to the SBI Crime Laboratory.

Table 2
No Suspect Rape Kits
Contractor's Progress

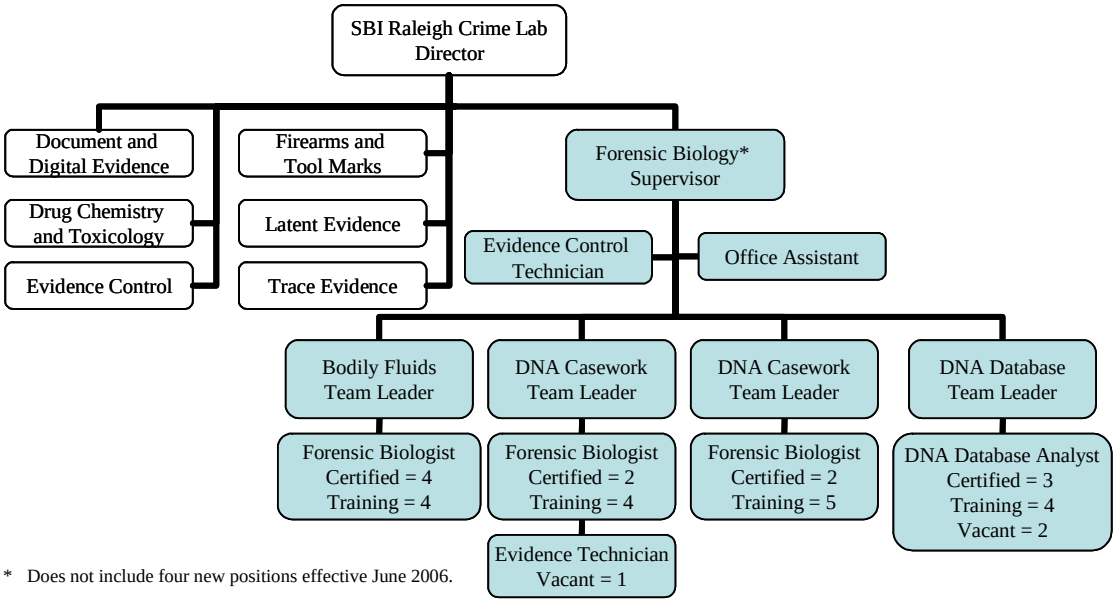
	Submitted	Completed
May 2005	514	
April		12
June		10
July		7
August		7
September		10
October		33
November		17
December		73
January 2006		58
Total		227
Return rate		44.2%

Organization and Staff

To fulfill the responsibilities within Forensic Biology, the section has 38 employees as shown in Exhibit 2. Prior to the 2005 Legislative Session, forensic biologists were trained as sworn agents but since the passage of Session Law 2005-276 Section 15.7(c) all new employees will be non-sworn personnel. This change eliminates the six-month sworn agent training for all new hires as well as the time it takes to maintain sworn status. Presently, the section has two DNA Database analysts that are not sworn agents and in June of 2006 Forensic Biology will receive four new non-sworn positions.

Exhibit 2

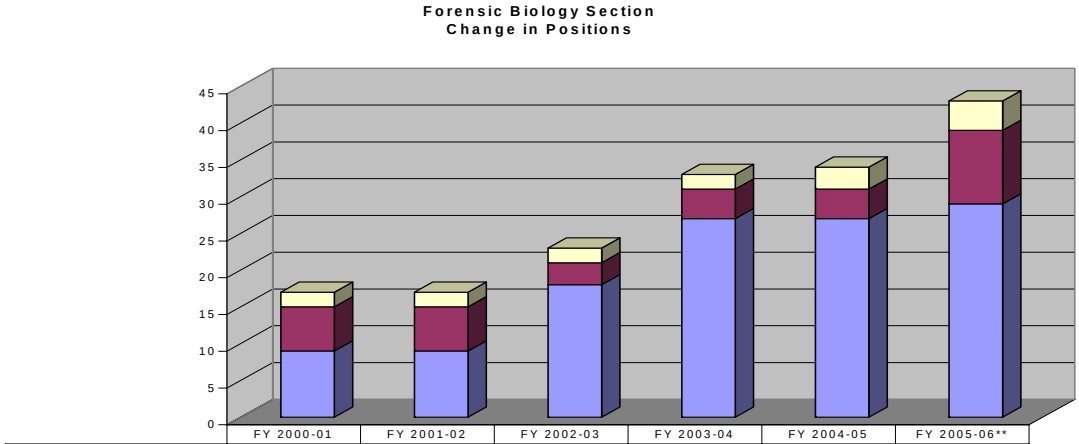
State Crime Laboratory - Raleigh
Organizational Structure as of February 2006



* Does not include four new positions effective June 2006.

Over the past six years the Forensic Biology section has experienced a 153% growth in positions as shown in Chart 3. This has helped to address the increased workload discussed on pages 2 and 3.

Chart 3

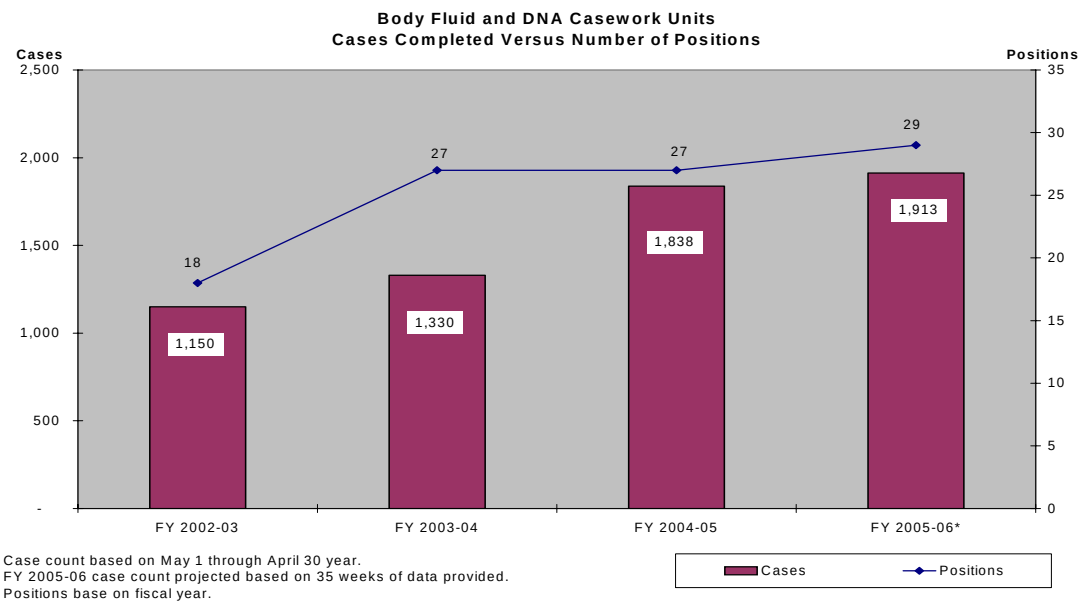


	FY 2000-01	FY 2001-02	FY 2002-03	FY 2003-04	FY 2004-05	FY 2005-06**
Other*	2	2	2	2	3	4
DNA Database	6	6	3	4	4	10
Body Fluid & DNA Casework	9	9	18	27	27	29

* Other = Supervisor, Office Assistant, and Evidence Control positions.
** Includes the 4 new positions effective June 2006.

Chart 4 shows a steady increase in annual criminal cases completed and laboratory testing and analysis positions for the Body Fluid and DNA Casework units. The growth rate over four years has been fairly consistent between cases completed and positions. Cases completed have increased by 66% while positions have increased by 61%.

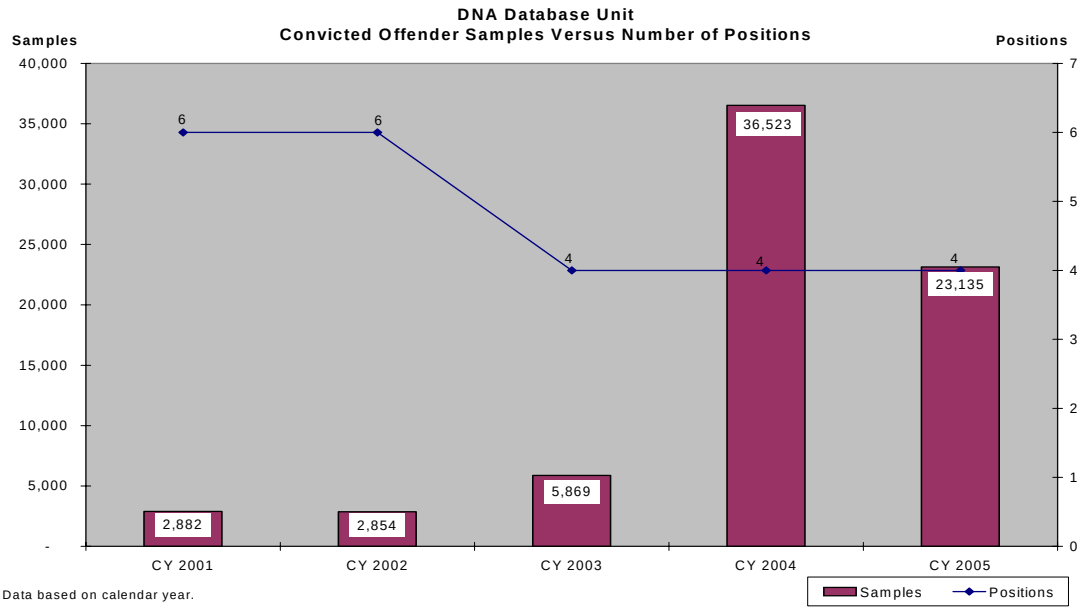
Chart 4



Case count based on May 1 through April 30 year.
FY 2005-06 case count projected based on 35 weeks of data provided.
Positions base on fiscal year.

Chart 5 shows a decrease in DNA Database positions while convicted offender samples have significantly increased. To some extent this issue has been addressed during the 2005 Legislative Session; the DNA Database unit received two new positions as of January 2006 and four more positions effective June 2006 which are not reflected in Chart 5. This brings the DNA Database unit to a total of 11 positions including the team leader.

Chart 5



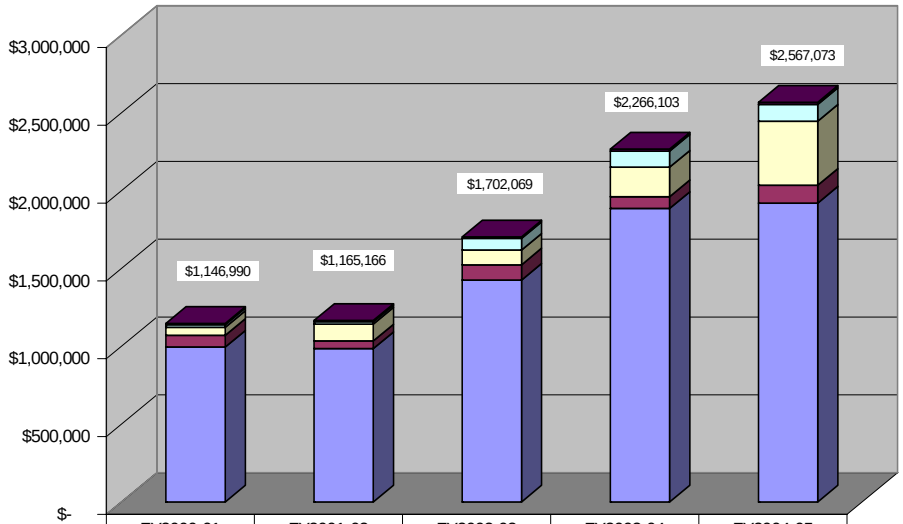
Data based on calendar year.

Financial

Chart 6 shows a five year estimate of operating expenditures for the Forensic Biology section. The SBI Crime Lab does not account for expenditures by section, so an estimate was calculated using an allocation method based on either budgeted salary amounts, cost of equipment reported in inventory, or square foot usage in the laboratory depending on the expenditure item. Over the last five years the Forensic Biology section has seen a steady increase in its operating budget which is a positive correlation to the increase in positions shown in Chart 3, on page 4. See Appendix A for detailed expenditures for each year.

Chart 6

Forensic Biology Section
FY2000-01 to FY2004-05
Estimated Operating Expenditures



	FY2000-01	FY2001-02	FY2002-03	FY2003-04	FY2004-05
Other Expenses	$8,277	$7,972	$9,248	$12,818	$13,886
Property Plant Equipment	$16,567	$13,987	$75,172	$103,179	$107,527
Supplies	$52,518	$109,173	$94,851	$189,095	$411,836
Purchased Services	$74,554	$48,531	$98,003	$75,824	$114,145
Personnel & Fringe Benefits	$995,074	$985,503	$1,424,795	$1,885,187	$1,919,679

Table 3 provides an estimate of the Forensic Biology section's 2006 budget. As with expenditures, the SBI Crime Lab does not budget by section, so an estimate was calculated using an allocation method based on either budgeted salary amounts, cost of equipment reported in inventory, or square foot usage in the laboratory depending on the expenditure item. Personnel costs which include fringe benefits are a large part of the budget and have increased from last year due to the seven new positions.

Table 3
Forensic Biology
FY 2005-06
Operating Budget

Personnel & Fringe Benefits	$	2,328,650	86.3%
Purchased Services		170,601	6.3%
Supplies		72,566	2.7%
Property Plant Equipment		95,098	3.5%
Other Expenses		32,123	1.2%
Total	**$**	**2,699,038**	

COST TO TEST AND ANALYZE DNA

State Crime Laboratory Cost

The expenditures identified for FY2004-05 were used to determine the cost of analyzing DNA. To identify the cost, a time allocation was made to the expenditure based on the time study conducted by OSBM for a seven week period. See Appendix B for Time Study results. As noted earlier, the SBI Crime Lab processes criminal case and convicted offenders DNA. The criminal case passes through the Body Fluid and DNA Casework units for completion. The convicted offender samples are prepared for outsourcing by the DNA Database unit. Table 4 shows the in-house cost to complete a criminal case and the combined cost to complete a rape kit or convicted offender sample. As mentioned earlier, some of rape kits are pre-screened for human biological material prior to sending to the contractor and others are sent to the contractor unscreened. The average cost of screened and unscreened rape kit is $729.47. The in-house cost for rape kits includes pre-screening costs for those kits requiring pre-screening, evidence control, technical and administrative (quality) reviews and the costs related to CODIS search and verification. Convicted offender in-house cost included the cost to prepare the samples, quality reviews and uploading results into CODIS. It will take an estimated 1,953 staff hours (equivalent to 1.1 FTE annually) to review the 514 rape kits that have been outsourced to the private laboratory and to monitor the contract.

Table 4
SBI Cost to Process DNA

		No Suspect Rape Kit		
	Criminal Case	Unscreened	SBI Pre-Screened	Convicted Offender
In-house Cost per Case or Sample	$ 568.96	$ 236.03	$ 287.90	$ 7.58
Out-Source Cost	-	$ 445.00	$ 490.00	$ 34.55
Total Cost to Process	$ 568.96	$ 681.03	$ 777.90	$ 42.13

Private Laboratory Cost

The SBI Crime Lab issued a Request for Proposal to outsource no suspect rape kits in September 2004. To bid, private laboratories must be accredited for DNA analysis and Forensic Biology, and have the capacity for additional casework. There were five qualified vendors and Table 5 shows the cost for each laboratory to process unscreened rape kits. The costs range from $445 to $1,200 per case. These costs are *only associated with laboratory processing* and do not include court appearances for expert testimony which can be up to $2,000 per day plus travel expenses, and do not included SBI in-house costs for evidence control, quality reviews or searching CODIS for a match.

Table 5
Private Laboratory Cost

Laboratory	Cost
1	$445
2	$575
3	$645
4	$695
5	$1,200

Laboratory 1 is the contractor for SBI No Suspect Rape Kits

Table 6
States use of Private Laboratories
Convicted Offender Samples

State	Cost
Indiana	$30
Kansas	$50
North Carolina	$42
Oklahoma	$30
South Carolina	$28
Tennessee	$28
Utah	$54

The National Institute of Justice (NIJ) provides a grant, "Convicted Offender DNA Backlog Reduction", which allows states to process samples in-house or outsource. NIJ performs the contracting work and notifies those states which choose to outsource, of the availability of laboratories. Table 6 shows others states, including North Carolina, that have outsourced the processing of convicted offender samples to private laboratories and the cost per sample. This information was obtained from the survey of 49 states and the District of Columbia. The survey instrument can be found in Appendix C.

Other Public Laboratory Cost

There were 13 respondents (26%) to the survey conducted of other states and seven provided usable cost and case data as shown in Table 7 (on the next page), which includes North Carolina's cost. The average

cost for other states to process criminal cases and rape kits range from $425 to $1,720 per case/kit. It should be noted that Oklahoma and Nebraska outsource rape kits and it is unknown if these costs are inclusively the private laboratory fee or if it includes in-house quality reviews.

Table 7
Other State's Crime Lab Average Costs and Completed Cases/Kits

State	DNA Casework		Rape Kits		Casework & Kits	
	Cases	Cost per Case	Kits	Cost per Kit	Total Cases/Kits	Avg. Cost per Case/Kit
Delaware	100	$900	45	$900	145	$900
Iowa	960	$1,800	540	$1,300	1,500	$1,550
Kansas	400	$1,200	350	$900	750	$1,050
Nebraska	350	$350	200	$500	550	$425
North Carolina*	1,383	$569	227	$729	1,610	$649
Oklahoma	250	$1,140	100	$2,300	350	$1,720
Utah	76	$1,710	Unknown	$60	76	$885
Virginia	3,690	$875	134	$675	3,824	$775

*Rape kit cost for outsourced kits only. Cost per kit is the average of pre-screened and unscreened costs

Responses to the survey show six other States (Table 6, on page 7) outsourced convicted offender samples while four states process convicted offender samples in the state crime laboratory. Table 8 shows the cost to process convicted offender samples in-house which ranges from $25 to $110 per sample.

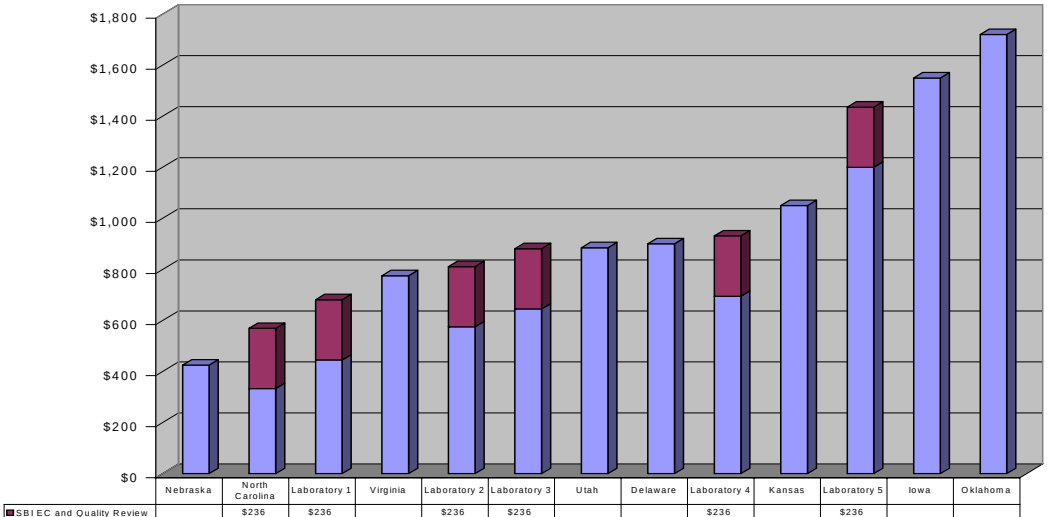
Table 8
Convicted Offender
In-House Processing

State	Cost per Sample
Delaware	$25.00
Iowa	$110.00
Nebraska	$35.00
Virginia	$50.00

Cost Comparison

Chart 7 compares the North Carolina Crime Laboratory cost to process a criminal case and the average cost pre case of seven public and five private laboratories. For a valid comparison the cost incurred by the SBI for evidence control and quality reviews, $236 per case, were added to the private laboratory costs since this would be the true cost if cases were outsourced. The North Carolina Crime Laboratory ranks second in cost per case.

Chart 7



All private lab costs include the SBI cost related to evidence control and quality reviews for a true comparison.
It is unknown if quality reviews are included in the cost provided by other public laboratories.
Laboratory 1 is the contractor for the SBI no suspect rape kits

ELIMINATION OF BACKLOG

The SBI backlog is 261 criminal cases as of 2/21/2006. The Section is also in the possession of 35,357 convicted offender samples which will be sent to a private laboratory for analysis. We will not address the convicted offender backlog samples since the SBI is dependent on the NIJ for approval to submit samples to a private laboratory for testing. The Convicted Offender Backlog Reduction grant covers the cost for DNA testing of convicted offenders and the SBI processes the blood sample by staining cards and retains the samples until approval is received by the NIJ. The SBI has been approved for funding for the current grant year and is in the process of outsourcing the backlogged convicted offender samples with an option for up to 43,800 samples for calendar year 2006. It is not unusual for the SBI Crime Lab to have several thousand samples waiting to be outsourced due to the federal procedures for this grant. This is not unique to North Carolina but a national issue. The SBI Crime Lab will process a sample if the convicted felon is a suspect in an on-going case.

In addition to the backlog cases at the SBI Crime Lab, the SBI has contracted with a private laboratory to process no suspect rape kits. There were 514 kits submitted to the private lab in May 2005 and 227 kits have been completed and returned as of January 31, 2006 (see Table 2, on Page 3). The turnaround time for the private lab is 198 days as shown in Table 10 (Laboratory 1). The private lab has 287 rape kits that have not been processed after seven months. These kits will be considered backlog since the contract agreement stated a 30 to 60 day turnaround time with a limit of 350 cases a month. Table 9 shows the cost to eliminate the backlog at the SBI and the remaining kits at the private laboratory. The SBI cost for evidence control and quality review was added to private labs to obtain the actual total cost to eliminate these cases/kits.

Table 9
Elimination Cost
SBI Criminal Cases and Private Laboratory Rape Kits

Laboratory	Cost / Case	261 SBI Criminal Cases	287 No Suspect Rape Kits Remaining at Private Lab	Evidence Control & Quality Reviews*	Total Cost
North Carolina	$569	$148,509	$163,303		$311,812
Laboratory 1	$445	$116,145	$127,715	$129,328	$373,188
Laboratory 2	$575	$150,075	$165,025	$129,328	$444,428
Laboratory 3	$645	$168,345	$185,115	$129,328	$482,788
Laboratory 4	$695	$181,395	$199,465	$129,328	$510,188
Laboratory 5	$1,200	$313,200	$344,400	$129,328	$786,928

* Costs incurred by the SBI when cases are outsourced
Laboratory 1 is the contractor for the SBI No Suspect Rape Kits

Table 10
Turnaround Time Comparison
Public and Private Laboratories

Laboratory	Lab Work	SBI Review	Total Days
Laboratory 4	30	21	51
Utah			60
Laboratory 5	60	21	81
Delaware			91
Iowa			92
North Carolina	72	21	93
Laboratory 2	75	21	96
Laboratory 3	75	21	96
Missouri			101
South Carolina			137
Kansas			153
Connecticut			167
Tennessee			168
Virginia			175
Nebraska			180
Oklahoma			198
Laboratory 1	198	21	219
Massachusetts			228
Indiana			243

Turnaround time reported in calendar days
Laboratory 1 is the contractor for SBI No Suspect Rape Kits

Table 10 shows a turnaround time comparison for completed cases, including rape kits, at other public and private laboratories and is based on calendar days. To obtain a true comparison of the amount of time to complete a case/kit, quality review time must be considered. The private laboratories turnaround time does not include this review time. When outsourcing occurs the private lab performs the pre-screening and, if necessary, DNA analysis and returns the results to the SBI. The SBI is required to conduct quality reviews prior to finalizing a case/kit.

It should be noted that laboratory processing times are dependent on the type of equipment used by a laboratory. In the survey of other states most states use the 310 platform which can process only one sample at a time. The SBI Crime Lab uses the 3100 platform which is able to process 16 samples at one time.

If there is a threat to public safety, the case is under rush status and laboratory processing work can be

completed in 11 calendar days and the quality reviews in 21 calendar days. Cases not under a rush status, once submitted by law enforcement, can be completed in 93 calendar days. The difference between rush status and average processing time is the wait time of 61 days. The majority of wait time is attributed to limited staff in the DNA Casework unit. This unit has four certified analysts and nine analysts in training to process cases. Once the trainees are certified the wait time should be reduced. For a detailed timeline of completing a case see Appendix D.

In order to determine the length of time it would take to eliminate the SBI criminal case backlog and the rape kits remaining at the private lab, capacity at the laboratories must be analyzed. A laboratory must have the ability to process additional cases/kits with the present staff level or must add staff to increase the number of cases/kits that could be processed. This analysis, as shown in Table 11, compares different levels of capacity to determine the length of time it will take to eliminate the backlog of cases and rape kits and includes the SBI quality review time.

Table 11
Elimination Time
SBI Criminal Cases and Private Laboratory Rape Kits
At Different Levels of Laboratory Capacity

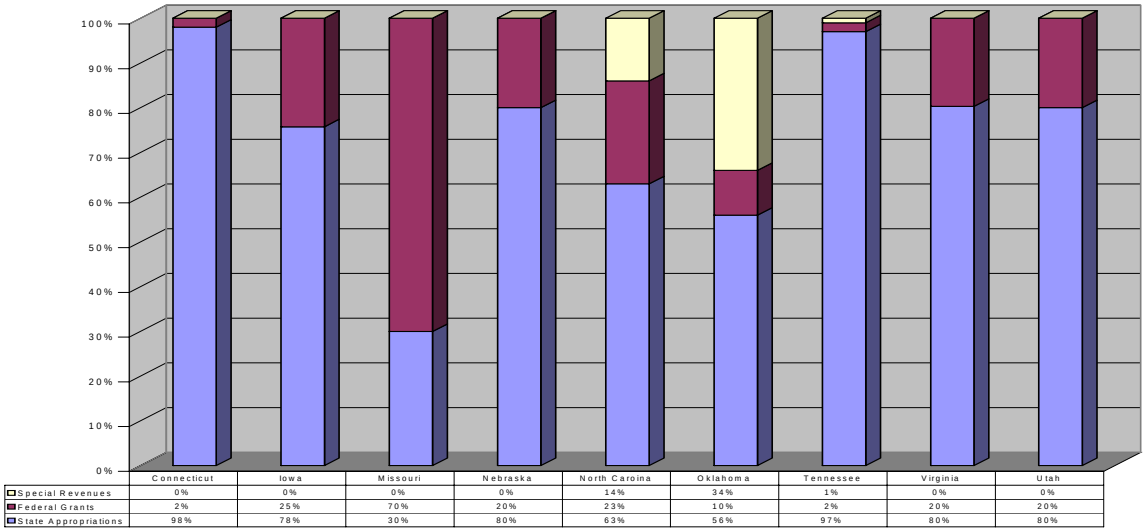
Laboratory	Average Turnaround Time*	NUMBER OF DAYS TO ELIMINATE BACKLOG AT DIFFERENT CAPACITY LEVELS Additional Cases Processed per Month 50 Cases	100 Cases	150 Cases	200 Cases	250 Cases	300 Cases	350 Cases	400 Cases
Laboratory 4	51 Days	350	185	131	103	87	76	68	62
Laboratory 5	81 Days	380	215	161	133	117	106	98	92
NC Crime Lab	93 Days	392	227	214	145	129	118	110	104
Laboratory 2	96 Days	395	230	176	148	132	121	113	107
Laboratory 3	96 Days	395	230	176	148	111	121	113	107
Laboratory 1	219 Days	518	353	299	271	255	244	236	230

* It takes the SBI 21 days to complete a quality reviews. This time has been added to the private laboratory turnaround time.
All time is in calendar days
Laboratory 1 is the contractor for SBI No Suspect Rape Kits

OTHER STATES' FUNDING SOURCES

Included in the survey of other states were questions regarding funding. Chart 8 shows the other states' funding source breakdown by percent. Most states depend heavily on state appropriations and federal grants as the major source of funding. There are only two states, beside North Carolina, which utilize special funds (fees and surcharges) to offset the cost of DNA testing and analysis.

Chart 8



	Connecticut	Iowa	Missouri	Nebraska	North Caroina	Oklahoma	Tennessee	Virginia	Utah
Special Revenues	0%	0%	0%	0%	14%	34%	1%	0%	0%
Federal Grants	2%	25%	70%	20%	23%	10%	2%	20%	20%
State Appropriations	98%	78%	30%	80%	63%	56%	97%	80%	80%

Federal Funds

The President's DNA Initiative allocated millions of dollars for reducing DNA casework and convicted offender backlogs, improving DNA testing and analysis, and enhancing lab capacity. The National Institute of Justice (NIJ) administers these grants. Table 12 shows a comparison of different grants awarded to other states that responded to our survey. The SBI Crime Lab receives funds from all eligible grants related to DNA. Table 13 shows the type of assistance provided by each grant.

Table 12
Comparison of Federal Fund Awards
FY2001 through FY2005

State	Coverdell Forensic Science Improvement	Forensic Casework DNA Backlog Reduction	Convicted Offender DNA Backlog Reduction	DNA Capacity Enhancement	Crime Laboratory Improvement	No Suspect Casework DNA Backlog Reduction
Connecticut	✓	✓	✓			
Delaware	✓	✓	✓	✓		
Indiana	✓	✓		✓	✓	
Iowa	✓			✓	✓	
Kansas	✓				✓	✓
Massachusetts	✓	✓	✓	✓		
Missouri	✓	✓	✓	✓		
Nebraska	✓	✓		✓		✓
North Carolina	✓	✓	✓	✓	✓	✓
Oklahoma		✓	✓	✓		✓
South Carolina	✓	✓	✓	✓	✓	✓
Tennessee	✓	✓	✓	✓		
Utah	✓		✓		✓	
Virginia	✓	✓		✓		

Table 13
Type of Assistance Allowed by Each Program
FY2001 through FY2005

Type of Assistance	Funding Programs					
	Coverdell Forensic Science Improvement Grant Program	Forensic Casework DNA Backlog Reduction	Convicted Offender DNA Backlog Reduction	DNA Capacity Enhancement	Crime Laboratory Improvement	No Suspect Casework DNA Backlog Reduction
Education & Training	Yes	No	No	Yes	Yes	No
DNA Sample Analysis	No	Yes	Yes	No	No	Yes
Accreditation/ Certification	Yes	No	No	Yes	No	No
Equipment/ Supplies	Yes	Yes (supplies only)	Yes	Yes	Yes	Yes (supplies only)
Facilities/ Renovation	Yes	No	Yes	Yes	Yes	No
Personnel (Overtime and/or Contractors)	Yes	Yes	Yes	Yes	Yes	Yes

Special Funds

Responses to the survey and additional Internet research identified several states that utilize fees and surcharges to offset some of the cost for DNA processing. Table 14 identifies the states and different methods used for funding. There are 20 other states that charge the convicted offender a fee for DNA processing. These fees range from $30 to $2,000 or can be the actual cost of processing the sample. A significant issue with charging the convicted offender a fee is collections. Many states have low collection rates since the incarcerated individual's ability to pay the fee is limited. North Carolina General Statute 7A-304(a)7 allows the court to impose a $300 fee if DNA testing for alcohol or controlled substances was used as evidence at trial and the defendant is found guilty.

Only one state charges the submitting agency for work conducted by the laboratory ($100 per sample). Some states are more innovative when raising funds for forensic biology activities. Five states add a surcharge ranging from $1 to $25 to traffic tickets or court filings to supplement forensic biology costs. California adds a $1 surcharge for every $10 a convicted offender is ordered to pay as part of their sentence, and Arizona raises funds through a 3% surcharge on fines and penalties collected by the courts including traffic and littering tickets.

Table 14
Special Funding Methods Used by Other States

State	Fees			Surcharges		
	Convicted Offenders		Submitting Agency	Court Filings*	Criminal Conviction*	Traffic Tickets
	Felony	Misdemeanor				
Alabama				$2		
Arizona	Actual Cost				3%	
Arkansas	$250			$25		
California					10%	
Florida	Actual Cost					
Hawaii**	$500					
Idaho***	$500 / Sample					
Indiana				$1		
Illinois	$200					
Kansas	$400					
Massachusetts	$110					
Michigan	$60	$30				
Mississippi			$100 / sample			
Missouri	$30	$15				
Nevada	$150					
New York	$50					
New Jersey						$2
North Carolina****	$300	$300				
North Dakota	Actual Cost					
Oklahoma	$150					$5
Pennsylvania	$250					
South Carolina	$250					
Texas*****	$250					
Utah	$70					
Washington	$250					
Wisconsin	$250					

* Includes Traffic and Littering Tickets
** Fee assessed to sex and violent offenders
*** Maximum assessment $2,000
**** Fee assessed when testing for alcohol or controlled substances
***** Fee assessed to sex offenders only

OSBM wishes to express its appreciation to the SBI Forensic Biology section staff and employees within the Department of Justice for their cooperation during the performance of this study.

APPENDIX A

Forensic Biology Section
Estimated Operating Expenditures
FY 2000/01 to FY 2004/05

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APPENDIX A

Forensic Biology Section
Estimated Operating Expenditures
FY 2000/01 to FY 2004/05

Description	2004-05	2003-04	2002-03	2001-02	2000-01
Salaries-Appropriated	1,148,329	1,393,444	967,444	751,006	746,220
Salaries-Receipt	270,090				
Reg Temp Wages-Appropriated	1,963	17,315	-	-	-
OT Pay-Appropriated	48,489	33,221	53,039	14,585	17,638
Straight Time OT-Appropriated	23,810	39,228	34,420	20,744	27,419
OT Pay-Receipt	10,850				
Straight Time OT-Receipt	4,963				
Holiday Pay-Appropriated	406	582	281	160	22
Dual Emp Wages-Appropriated	-	-	67	-	-
EPA&SPA Longevity-Appropriated	9,398	29,090	29,848	16,392	15,977
EpA&SPA Longevity-Receipt	443				
SS Contribution-Appropriated	102,573	130,761	126,590	62,549	62,073
SS Contribution-Receipt	21,697				
Reg Retire Contribution-Appropriated	24,497	13,389	10,209	10,218	11,771
Reg Retire Contribution-Receipt	2,498				
LEO Retire Contribution-Appropriated	102,475	104,495	101,926	59,698	77,025
LEO Retire Contribution-Receipt	25,728				
Medical Insurance Contribution-Appropriated	91,342	111,537	96,431	45,408	35,438
Medical Insurance Contribution-Receipt	20,872				
Worker Comp-Medical Payment	2,047	3,388	3,097	481	1,491
Worker Comp-Permanent Disability Pmt.	6,000	-	1,442	-	-
Taxable Employee Expense Reimbursement	1,210	8,736	-	4,261	-
Personnel and Fringe Benefits Total	1,919,679	1,885,187	1,424,795	985,503	995,074
Admin Service-Temp Agency Service	-	-	7,467	4,552	3,619
Accreditation Services	-	1,527	-	-	-
Laundry Service Agreement	5,433	4,760	4,293	2,077	2,038
Lab Service Agreement	1,722	-	-	-	-
Waste Removal/Recycling Services	3,769	1,716	1,076	644	551
Miscellaneous Contractual Service	6,258	-	-	-	-
Electrical Service	685	-	-	-	-
Repairs Buildings	2,690	5,035	60	-	584
Repairs Other Equipment	5,807	3,797	5,052	3,186	29,285
Maintenance Agreement Buildings	808	-	-	487	-
Maintenance Agreement Equipment	34,953	32,310	53,440	26,989	29,285
Transportation-Air-In State	-	-	112	-	-
Transportation Air-Out State In US	8,333	2,091	2,072	277	762
Transportation Ground-In State	629	88	289	66	85
Transportation-Ground-Out State in US	1,011	524	463	57	277
Lodging in State	(19)	2,950	723	602	935
Lodging out State in US	10,033	5,873	6,429	1,228	1,898
Meals in State	4,526	2,642	1,589	581	804
Meals out State in US	3,888	2,319	2,896	924	1,097
Telephone Service	0	1	-	-	0
Postage Freight & Deliveries	151	805	7	52	13
Postage Freight & Deliveries-Mail Service	296	477	156	-	-
Postage Freight & Deliveries-Freight & Deliveries	-	-	18	158	102
Postage Freight & Deliveries-Postage Meter	685	905	367	-	139
Printing Binding Duplicating	3,832	157	3,222	1,868	1,262
Registration Fees	16,183	6,983	7,995	4,376	1,496
Employee Education Assistance Program	217	-	38	133	271
Other Employee Educational Expense	2,253	865	240	273	52
Purchased Services Total	114,145	75,824	98,003	48,531	74,554

APPENDIX A

Forensic Biology Section
Estimated Operating Expenditures
FY 2000/01 to FY 2004/05

Description	2004-05	2003-04	2002-03	2001-02	2000-01
General Office Supplies	4,736	1,906	2,745	1,890	2,025
Data Processing Supplies	815	3,281	238	2	482
Photographic Supplies	-	-	4,996	-	-
Security & Safety Supplies	3,422	5,232	4,160	1,584	77
Other Administrative Supplies	189	443	83	-	-
Carpentry & Hardware Supplies	17	-	-	-	-
Gasoline	36	23	31	-	11
Oil, Lubricant, Fluids	11	-	-	-	-
Tires & Tubes	-	43	-	-	5
Motor Vehicle Replacement Part	-	13	5	17	22
Clothing & Uniforms	1,662	1,104	474	-	-
Scientific Supplies	385,646	170,032	80,321	105,584	49,792
Educational Supplies	1,305	1,055	1,354	19	7
Other Materials & Supplies	13,997	5,963	444	77	96
Supplies Total	411,836	189,095	94,851	109,173	52,518
Building Planning - Amortization	2,194	2,194	2,194		-
Furniture-Office	1,026	413	58	162	374
Office Equipment	1,375	2,800	-	69	65
Equipment-Computers	-	-	-	52	2,125
Equipment-Scientific - Amortization	70,354	70,354	70,354	13,700	13,700
Equipment-Custody Security	-	-	446	-	-
Other Data Processing Equipment	30,084	23,361	855	-	-
Other Equipment	934	332	409	-	-
Library & Learning Resource Collections	6	36	27	-	-
Computer Software	-	-	-	4	304
Other Computer Software	1,554	3,689	829	-	-
Property Plant Equipment Total	107,527	103,179	75,172	13,987	16,567
License & Permit Costs	60	70	-	14	13
Service Charge-Sales Surplus	-	-	-	16	-
Membership Dues & Subscription	12,542	12,070	7,305	6,424	5,523
Other Administrative Expense	78	240	539	-	-
Other Expenses	1,205	438	1,404	1,518	2,741
Other Expenses Total	13,886	12,818	9,248	7,972	8,277
Grand Total	2,567,073	2,266,104	1,702,068	1,165,165	1,146,991

APPENDIX B

TIME STUDY
FORENSIC BIOLOGY LABORATORY PROCESSES

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TIME STUDY
Forensic Biology Section -- Evidence Control Function

Task	Related to Case	Data	Body Fluid Rape Case	Body Fluid Other Cases	Body Fluid Total	DNA Rape Cases	DNA Other Cases	DNA Total
		Sum of Minutes	482	403	885	45	8	53
	Evidence Tech - receive, open, prepare, store evidence (temporary or vault);	# of Cases	75	46	121	4	1	5
ET1	transfer SBI-5 form to front staff	Average mins. / cases	6.427	8.761	7.314	11.250	8.000	10.600
	Evidence Tech - Match evidence and SBI-5 form; If more than 1 piece of evidence on form, make copy of SBI-5 and place in appropriate COLOR folder to distribute. Identify evidence with lab number assigned by Laboratory Information Management System (LIMS).	Sum of Minutes	62	22	84	5	4	9
		Sum of # of Cases	19	9	28	2	2	4
ET2		Average mins. / cases	3.263	2.444	3.000	2.500	2.000	2.250
		Sum of Minutes	403	184	587	250	207	457
	Transport evidence to proper Section, Transfer evidence from cart to	Sum of # of Cases	147	64	211	129	92	221
ET3	Analyst thru LIMS; Receive evidence, if any, from Section.	Average mins. / cases	2.741	2.875	2.782	1.938	2.250	2.068
		Sum of Minutes	35	25	60	179	118	297
		Sum of # of Cases	12	7	19	72	43	115
ET4	Notified to pull case(s), identify oldest cases based on criteria and transfer.	Average mins. / cases	2.917	3.571	3.158	2.486	2.744	2.583
		Sum of Minutes	266	128	394	233	138	371
	Evidence Tech - Date & initial returned evidence, then mail it to law	Sum of # of Cases	74	28	102	96	40	136
ET5	enforcement officer; external transfer into LIMS.	Average mins. / cases	3.595	4.571	3.863	2.427	3.450	2.728
		Sum of Minutes	25	11	36	56	34	90
		Sum of # of Cases	10	7	17	30	20	50
ET6	Evidence Tech - Date & initial evidence pending DNA assignment.	Average mins. / cases	2.500	1.571	2.118	1.867	1.700	1.800
		Sum of Minutes	141	30	171	108	50	158
	Mark on chain of custody SBI-5 form ready to ship, delivers file folder for	Sum of # of Cases	77	16	93	66	33	99
ET7	review	Average mins. / cases	1.831	1.875	1.839	1.636	1.515	1.596
		Sum of Minutes	66	46	112	48	51	99
		Sum of # of Cases	56	20	76	58	38	96
ET8	Take file folder to the Evidence Control Unit.	Average mins. / cases	1.179	2.300	1.474	0.828	1.342	1.031
		Sum of Minutes	43	24	67	59	18	77
		Sum of # of Cases	470	197	667	457	269	726
	Interruption	Average mins. / cases	0.091	0.122	0.100	0.129	0.067	0.106

	Body Fluid	DNA
Subtotal minutes / case / section related	25.647	24.762
Add: 12.50% Personal and Fatigue Allowance	3.206	3.095
Total Minutes	28.853	27.857

Subtotal minutes / case related to type of case	
RAPE CASES	
Body Fluid	24.544
DNA	25.061
Total	49.605
Add: 12.50% Personal and Fatigue Allowance	6.20059
Rape Cases Total Minutes	55.805
OTHER CASES	
Body Fluid	28.091
DNA	23.068
Total	51.160
Add: 12.50% Personal and Fatigue Allowance	6.39497
Other Cases Total Minutes	57.555
ALL CASES	
Body Fluid	25.647
DNA	24.762
Total	50.409
Add: 12.50% Personal and Fatigue Allowance	6.30111
All Cases Total Minutes	56.710

TIME STUDY
Forensic Biology Unit -- Body Fluid Section
Certified Analysis Laboratory Time

Tasks Related to Case		Total # of evidence	Total # of cases	Total number of minutes	Avg. # pieces of evidence/ case	Avg. mins/ piece of evidence	Avg. mins/ case
A1	Receive and transfer of evidence between unit and ECU or between staff	1056	207	1040	5.1	0.985	5.024
A10	Organize, prepare evidence, review evidence & related documents, arrange evidence, gather related forms & tools, etc.	440	118	1160	3.7	2.636	9.831
L21	Conduct chemical & microscopic tests and/or alternate light source on evidence, & make related notes. Also includes time to prepare evidence to transfer or return--seal, initial evidence, etc.	774	117	9671	6.6	12.495	82.658
L60	Prepare official case documents/ final report	1938	231	2163	8.4	1.116	9.364
R85	Conduct technical review	1363	208	1785	6.6	1.310	8.582
R90	Conduct administrative review	1113	141	1150	7.9	1.033	8.156
A100	Provide technical assistance--time discussing case with peers, supervisor, other agents, or DA's	47	47	3759	1.0	79.979	79.979
A110	Clean lab, prepare chemicals, obtain supplies for lab	19	19	650	1.0	34.211	34.211
					6.2		

	Avg. Minutes/ Evidence
Sub-total Minutes / Pieces of evidence for all tasks above:	133.764
ADD:	
Chemical mix time: 70 hours annually	0.084
Interruptions: 266	0.039
Subtotal Minutes for all tasks within the section	133.887
ADD: Personal and Fatigue Allowance of 12.50%	16.736
Evidence Control Unit time	4.651
Grand-Total Minutes	155.274

TIME STUDY

Forensic Biology Unit -- DNA Casework Section

Certified Analysis Laboratory Time

Tasks Related to Case		Total # of evidence	Total # of cases	Total number of minutes	Avg. # pieces of evidence/ case	Avg. mins/ piece of evidence	Avg. mins/ case
A1	Receive and transfer evidence between unit and ECU or between staff	93	58	745	1.603	8.011	12.845
A10	Organize, prepare evidence, review evidence & related documents, arrange evidence, gather related forms & tools, etc.	140	24	535	5.833	3.821	22.292
L30	Conduct DNA extraction (do not include water bath times)	331	56	4245	5.911	12.825	75.804
L31	Conduct DNA quantification set up	307	32	665	9.594	2.166	20.781
L32	Conduct DNA quantification	272	28	900	9.714	3.309	32.143
L33	Conduct PCR set up	314	31	1030	10.129	3.280	33.226
L34	Conduct 3100 set up	335	31	695	10.806	2.075	22.419
L41	Analyze DNA - making allele calls, key into CODIS, do statistical analysis (DNA analysts)	701	100	4515	7.010	6.441	45.150
L50	Prepare evidence to transfer or return--seal, initial evidence, etc.	144	52	1185	2.769	8.229	22.788
L60	Prepare official case documents -- data entry to LIMS, other materials, final report	560	116	4564	4.828	8.150	39.345
R85	Conduct technical review for work completed in-house	634	104	6118	6.096	9.650	58.827
R90	Conduct administrative review for work completed in-house	705	193	5346	3.653	7.583	27.699
A100	Provide technical assistance--time discussing case with peers, supervisor, other agents, or DA's	63	63	2955	1.000	46.905	46.905
A110	Clean lab, prepare chemicals, obtain supplies for lab	45	45	547	1.000	12.156	12.156
					5.0		

	Avg. Minutes/ Evidence
Subtotal Minutes / Pieces of evidence for all tasks above:	134.600
ADD:	
Chemical mix time: 85 hours annual	0.148
Instrument maintenance time	0.445
Interruptions: 147	0.032
Subtotal Minutes for Laboratory work	135.225
ADD: Personal and Fatigue Allowance of 12.50%	16.903
Evidence Control Unit time	5.542
Instrument Time (none, machine time is simultaneous to other tasks performed)	0.000
Grand Total Minutes	157.671

TIME STUDY
Forensic Biology Section -- DNA Database Unit

Tasks Related to Samples		Total # of Samples	Total number of minutes	Avg. Minutes/ Sample
A1	Receive samples from ECU or other staff	15	60	0.250
A2	Obtain additional information from submitting agency	120	160	0.750
A10	Organize, prepare samples, fill out forms	4,503	5,110	0.881
L29	Hole punch / cut of sample for vendor	2,940	2,670	1.101
L30	Prepare samples for DNA extraction and setting up robot	870	1,140	0.763
L33	Gel pouring	19	30	0.633
L34	Conduct PCR set up for amplification (setting up robot)	5	30	0.167
L42	Computer work - analyze DNA - key into CODIS	56	90	0.622
L50	Prepare evidence for storage--seal samples, put in freezer	1,150	660	1.742
L60	Prepare official documents -- complete file, checklist, and do final data entry to CODIS	4,147	360	11.519
R80	Technical and administrative review--Conduct CODIS review (2nd database read)	2	45	0.044
A100	Provide technical assistance--time discussing case with peers, supervisor, other agents, or DA's	2	80	0.025

	Avg. Minutes/ Sample
Subtotal Minutes / Pieces of evidence for all tasks above:	18.499
ADD:	
Interruptions: 12	0.001
Subtotal Minutes for Laboratory Work	18.500
Personal and Fatigue Allowance of 12.5%	2.312
Grand Total Minutes	20.812

TIME STUDY
FORENSIC BIOLOGY SECTION -- OUTSOURCED RAPE KIT WORK

Tasks Related to Case		Total # of evidence	Total # of kits	Total number of minutes	Avg. # pieces of evidence/ Kit	Avg. mins/ piece of evidence	Avg. mins/ kit
A10	Organize, prepare evidence, review evidence & related documents, arrange evidence, gather related forms & tools, etc.	50	7	60	7.143	1.200	8.571
A100	Provide technical assistance--time discussing case with peers, supervisor, other agents, or DA's	32	51	495	0.627	15.469	9.706
L41	Analyze DNA - making allele calls, key into CODIS, do statistical analysis (DNA analysts)	16	20	45	0.800	2.813	2.250
L60	Prepare official case documents -- data entry to LIMS, other materials, final report	51	9	225	5.667	4.412	25.000
V70	Contact and/or communication with out-source vendor related to grant management	50	13	100	3.846	2.000	7.692
V72	Conduct technical review for work completed by out source vendor	121	82	2055	1.476	16.983	25.061
V73	Conduct Administrative review for work completed by out-source vendor	6	2	90	3.000	15.000	45.000
V80	Communication and/or contact with out-source vendor related to cases	0	1	30	0.000	0.000	30.000

		Avg. Minutes/ Rape Kit
Subtotal Minutes / Pieces of evidence for all tasks above:		153.281
ADD: Personal and Fatigue Allowance of	12.50%	19.160
Subtotal		172.441
ADD: Evidence Control Unit time		55.805
Grand Total Minutes		228.246

Hours per outsourced rape kit	3.8
Rape kits outsourced	514
Total hours to review outsourced cases	1953.2
1 FTE annual hours	1760.0
FTE to review outsourced cases	1.1

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APPENDIX C

OTHER STATES QUESTIONNAIRE

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State Crime Laboratory **APPENDIX C**
DNA Testing and Analysis
Other State Questionnaire

State: _____ **Name**: _____

Telephone #:_____ **Title**: _____

TESTING AND ANALYSIS

1. Annually, how many cases/samples are processed by your laboratory?

    a. Average number of DNA samples per case (standards and unknowns)_____
    b. Number of DNA cases _____
    c. Number of rape kits received_____
    d. Number of rape kits tested through DNA_____
    e. Convicted Offender samples_____

2. Do you outsource (contract) any forensic DNA casework or convicted offender samples?

3. If yes to #2, how many cases are processed annually by contractors?

    a. Average number of DNA cases outsourced_____
    b. Average number of rape kits outsourced_____
    c. Convicted Offender samples outsourced_____

4. Presently, do you have a backlog of forensic DNA cases or convicted offender samples?

5. If yes to #4, what is the number of:

    a. All forensic DNA cases_____
    b. Rape kits only _____
    c. Convicted Offender samples _____

6. What is the average cost for processing through DNA testing:

    a. An average DNA case _____
    b. Rape kit _____
    c. Convicted Offender sample_____

7. What is the average turnaround time for an:

    a. An average DNA case _____
    b. Rape kit _____
    c. Convicted Offender sample_____

8. What is the current DNA platform used in your laboratory for Forensic DNA casework? (check all that apply)

    a. FMBIO _____
    b. 377 _____
    c. 310 _____
    d. 3100 _____
    e. Other _____

9. What types of DNA testing does your laboratory perform? (check all that apply)

    a. STR analysis _____
    b. Mitochondrial testing _____
    c. Y-STRs _____

ORGANIZATION

10. How many analyst positions are in the crime laboratory?

    a. Full time _____
    b. Part time _____

11. How many analyst positions are in the forensic biology section?

    a. Full time _____
    b. Part time _____

12. What population size does your section serve?

FUNDING

13. What is the annual budget for the crime laboratory?

14. What is the annual budget for the forensic biology (DNA) section of the crime laboratory?

15. For the forensic biology section, what percent of funding is provided by

    a. Legislative body (State Funds)? _____%
    b. Federal government? _____%
    c. Special Revenue (Fees)? _____%

16. If federal funds are received, what federal grants have been award to your State?

17. If fees are assessed for testing and/or analysis, please list to whom are fees charged and the fee amounts?

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APPENDIX D

CASE COMPLETION TIMELINE

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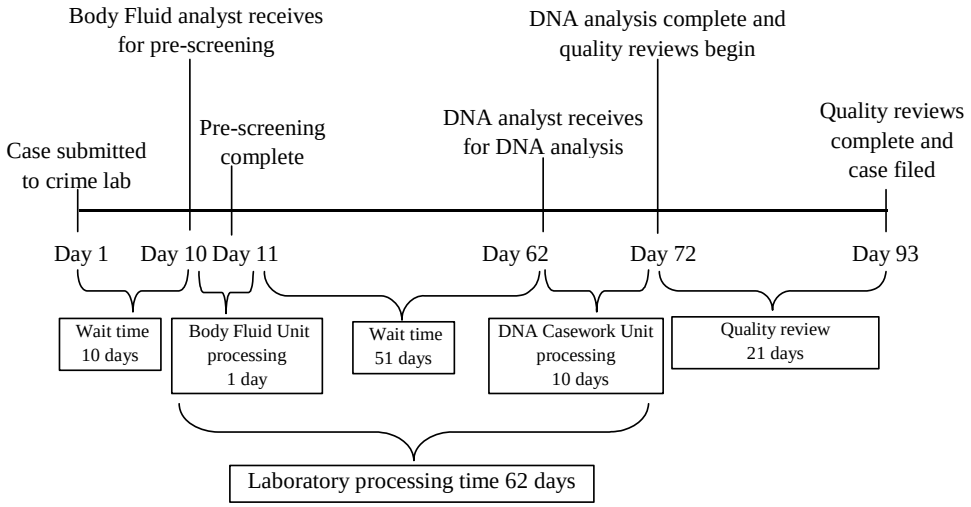
APPENDIX D

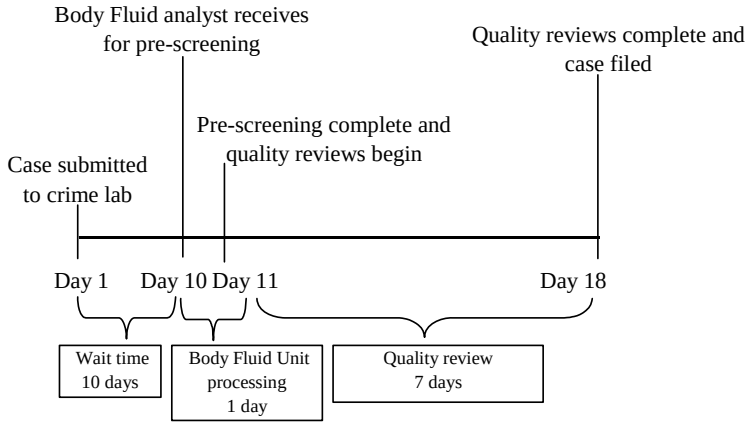
SBI Crime Lab DNA Case Processing Timeline (Calendar Days)

Pre-Screening Identifies Human Biological Material Requiring DNA Analysis (approximately 65% of cases)



Average Laboratory Processing Time = 11 days
Average Quality Review Time = 21 days
Average Wait Time = 61 days
Average time to complete a case requiring DNA Analysis = 93 days

Pre-Screening Identifies No Human Biological Material (approximately 35% of cases)



Average Laboratory Processing Time = 1 days
Average Quality Review Time = 7 days
Average Wait Time = 10 days
Average total time to complete a case with no DNA analysis = 18 days

The average of these two processes is 66.75 calendar days.
Data obtained from calendar year 2005 cases.