

FORENSIC SCIENCE OVERSIGHT BOARD

July 2022 Boston Police Department Forensic Laboratories Audit Report



1. Executive Summary

Pursuant to Section 9 of Chapter 69 of the Acts of 2018, *An Act Relative to Criminal Justice Reform* (hereinafter “The Criminal Justice Reform Act”), the Forensic Science Oversight Board (hereinafter “FSOB” or “the Board”) was established to “have oversight authority over all commonwealth facilities engaged in forensic services in criminal investigations” and to “provide enhanced, objective and independent auditing and oversight of forensic evidence used in criminal matters, and of the analysis, including the integrity of such forensic analysis performed in state and municipal laboratories.”

The FSOB is also charged with: creating a process by which the scientific validity of a forensic science technique or analysis commonly used in criminal matters shall be investigated; developing, implementing and periodically reviewing a system for forensic laboratories to report professional negligence or misconduct; actively engaging stakeholders in the criminal justice system in forensic development initiatives and recommending ways to improve education and training; and developing, implementing, and periodically reviewing a system to evaluate laboratory education and professional licensing processes.¹

The following report contains the FSOB’s findings of its audit of the accredited Boston Police Department Crime Laboratory, the Boston Police Department Firearms Analysis Unit, and the Boston Police Department Latent Print Unit. The audit also included Units that are not currently accredited including the Boston Police Department Crime Scene Response Unit and the Boston Police Department Electronic Crimes Unit. The foundation of this report is a review of documents provided by the Boston Police Forensic Division related to their organization, management system, training and qualification records, and accreditation documentation.

¹ See Section 9(d)-(g) of Chapter 69 of the Acts of 2018 “*An Act Relative to Criminal Justice Reform*”

2. Boston Police Department Forensic Division

Organizational Structure

The Boston Police Department's (BPD) Forensic Division is assigned within the BPD's Bureau of Investigative Services' (BIS) Criminal Investigative Division (CID). The Forensic Division is supervised by a sworn Superintendent who is the BIS Bureau Chief, a sworn Deputy Superintendent who is in charge of CID, and a sworn Captain (currently vacant) who is the commander of the Forensic Division. Within the Forensic Division, there are five distinct units:

1. Crime Laboratory Unit - CLU
2. Latent Print Unit - LPU
3. Firearms Analysis Unit - FAU
4. Crime Scene Response Unit - CSRU
5. Electronic Crimes Unit - ECU

Each of these units is independently managed while under the chain of command of the BIS / CID. Overall, there are 95 sworn and civilian personnel assigned to the Forensic Division belonging to 7 different unions. Each unit has its own operating budget, with the exception of the Electronic Crimes Unit. The Division is housed at Boston Police Headquarters at 1 Schroeder Plaza. The Division has approximately 15,000 square feet, with the provision of additional office space on the north side of the building under consideration.

Crime Laboratory Unit

The Boston Police Crime Laboratory is overseen by a civilian Director Kevin Kosiorek. The unit is accredited under ANSI National Accreditation Board (ANAB) ISO/IEC 17025:2017. The unit is comprised entirely of civilian personnel and is broken down into three sections: DNA, Criminalistics and Trace Evidence. The unit is staffed by 24 civilian employees, who work an administrative schedule, but also rotate an on-call schedule for call backs for major incidents and collection of evidence at the scenes. The minimum entrance qualifications for an entry-level position are a four-year degree from a Forensic Science Program or a Natural Science degree. The minimum qualifications for a director are a Bachelor's Degree, with a Master's degree, or PhD preferred, with ten years of laboratory experience and three years of management experience. Currently, certification is voluntary and there are 16 (~66%) out of 24 employees that hold certifications. This is an added benefit and the laboratory supports the staff's certification and maintenance fees.

The Crime Lab provides the following services:

- DNA
 - STR Analysis
 - CODIS – NDIS
- Trace Evidence

- Hair / Fiber examination
 - Unknown material testing
 - Primer / Gunshot residue testing (GSR)
 - Paint, tape, coating, and glass analysis
- Criminalistics
 - Biological screening
 - General evidence examination
 - Crime scene processing
 - Bloodstain pattern analysis
 - Footwear comparison
- Firearms
 - Serial number restoration
 - GSR distance determination
 - Shooting reconstruction

The unit is housed on the second floor, south side of the BPD headquarters and occupies approximately 6,000 square feet. Additional office space is also utilized on the third floor. Evidence is submitted at a window that is shared with Latent Prints, reviewed by a supervisor and assigned. The evidence section includes a supervisor and two evidence technicians and operates as the main intake area for all districts, and short-term storage facility. In addition, there are four evidence drying cabinets and storage lockers in the second-floor hallway, which are used during non-business hours. There are several distinct work areas, some of which double as meeting spaces. The areas have been reconfigured multiple times to accommodate changes in equipment, technology, or staffing levels. Dedicated evidence processing areas are provided for gunshot residue, serology/sexual assault, pre-AMP DNA, post-AMP DNA, serial number restoration, and trace evidence microscopy. Currently, the laboratory is in the process of installing a camera system to alleviate the need for outside stakeholders, including but not limited to, defense experts and other members of the defense team to come into the lab and witness the analysis. The camera installation was considered a stop-gap, as there was not enough room to have an observation area installed nor enough space for observations to take place within the laboratory. There is also a storage area for evidence that is being processed, before it is sent to long-term storage. The unit currently utilizes the BEAST system Laboratory Information Management System (LIMS) to allow customers to “pre-log” evidence submission information, track chain of custody, maintain case records and reports and allow electronic access to final reports to customers. The staff is in the process of converting older records to a digital format for long term storage. The laboratory will be implementing Qualtrax software to control documents and help manage their Quality System.

Over the last five years, the Crime Lab processed an average of 965 cases per year. The breakdown of cases by section for 2021 was:

- Trace Evidence: 96 cases assigned; 76 reports issued

- Criminalistics: 555 cases assigned; 663 reports issued
- DNA: 376 cases assigned; 635 casework samples processed & 2,177 training / validation samples processed

The DNA Section prioritizes cases into tiers for processing. These are:

- Tier 1 – All sexual assault samples including Track Kit² samples
- Tier 2 – Homicides and assaults
- Tier 3 – Property crimes and other case types

Currently, a Tier 1 Track Kit case has a 45-day turnaround time. A Tier 1 non-Track Kit has an 89-day turnaround time. Tier 2 & 3 cases have turnaround times of 128 and 125 days respectively. For Criminalistics, the turnaround time is 5.7 days for Sexual Assault cases and 24.25 days for all other cases. In the Trace Evidence discipline, the Gun Shot Residue cases are turned around in 64 days, while other cases are turned around in 74 days.

For completed cases that were submitted in 2022:

Criminalistics

Turnaround time (TAT) = 28 days

Median TAT = 16 days

Case Range = 1 - 324 = ~323 days

Serology/Sexual Assault

Turnaround time (TAT) = 10 days

Median TAT = 3 days

Case Range = 1 - 171 = ~170 days

Trace (PGSR/Paint/Fibers etc.)

Turnaround time (TAT) = 110 days

Median TAT = 104 days

Case Range = 6 - 355 = ~349 days

DNA (Combined all case submissions)

Turnaround time (TAT) = 126 days

Median TAT = 106 days

Case Range = 7 - 634 = ~627 days

As of information available in June 2022, the Crime Lab identified the following backlog data by service:

- 104 DNA cases
- 51 non-sexual assault criminalistics cases

² In 2018, Governor Baker signed a law granting the Executive Office of Public Safety and Security (EOPSS) the authority to establish and maintain a statewide Sexual Assault Evidence Collection Kit (SAECK) Tracking system. Track-Kit is a web-based application that works via online portals.

- 18 P-GSR cases
- 13 trace cases
- 7 sexual assault cases

Latent Print Unit

The Boston Police Department Latent Print Unit is overseen by a civilian Director Rachel Camper. The unit is accredited under ANSI National Accreditation Board (ANAB) ISO/IEC 17025:2017. It is comprised entirely of civilian personnel and is broken down into three sections: Comparison, Processing, and Automated Fingerprint Identification Systems (AFIS). The unit is staffed by 14 civilian employees, who work an administrative schedule but also rotate an on-call schedule for call backs. The minimum entrance qualifications for an entry-level position are a four-year degree from a Forensic Science Program or a Natural Science degree. The minimum qualifications for a director are a Bachelor's degree, with ten years of laboratory experience and three years of management experience. Currently, certification is voluntary and there are 10 certified latent print examiners and 10 certified crime scene investigators.

The Latent Print Unit provides the following services:

- Latent print field sampling
- Latent print processing
- Latent print comparison
- Automated Fingerprint Identification System Searches (AFIX & MORPHO)

The unit is housed on the second floor, south side of the BPD headquarters and contains one small working space with limited workstations, a "processing room" and a photography room. Analysts conduct comparisons at their desks and a new room is being equipped for AFIS terminals and an AFIS administrator. There is a vacuum chamber which deposits layers of metal on items and highlights the latent print for examination. Analyst(s) may be called out to a scene at the discretion of an investigator following a scene assessment per the CRSU Policy and Procedure Manual (Section 5.3.1).

Over the last five years, the Latent Print Section processed an average of 1,014 cases per year and the current turnaround time for processing a case is 12 days. For a comparison case, the current turnaround time is 28 days.

For completed cases that were submitted in 2022:

Latent Prints Processing

Turnaround time (TAT) = 15 days

Median TAT = 9 days

Latent Print Comparison

Turnaround time (TAT) = 36 days

Median TAT = 29 days

Case Range = 1 - 189 = ~188 days

As of information available in June 2022, the latent print unit identified a backlog of 37 cases.

Firearms Analysis Unit

The Boston Police Department Firearms Analysis Unit (FAU) is overseen by a sworn Sergeant-Detective. This position is currently vacant due to a recent promotion. The unit is accredited under ANSI National Accreditation Board (ANAB) ISO/IEC 17025:2017. It is comprised of both sworn and civilian staff, represented by three different unions, and is broken down into three sections: Firearms Examination, Integrated Ballistic Identification System (IBIS) and Evidence which are staffed by 6 civilian employees, and 6 sworn officers of different ranks who work an administrative schedule, but also rotate an on-call schedule for call backs. The minimum entrance qualifications for an entry-level position in Firearms Examination is a four-year degree from a Forensic Science Program or a Natural Science degree. The minimum requirements for an entry-level position in the IBIS section is a Bachelor's Degree. The current qualification requirements for the supervisor of the FAU is at least the ranking of Sergeant Detective, and the "willingness to develop a knowledge base about criminalistics, forensic science and the management and operations of a forensic laboratory". Currently, certification is voluntary and there are 2 certified Firearms Examiners. Hiring and retention of qualified examiners has been an issue in this section. Promotions, transfers, and retirements of sworn officers has led to a backlog and longer turnaround times. Recruiting qualified civilian examiners has proven difficult as well. The forthcoming promotion of a current staff member threatens the unit even further. The unit is currently awaiting approval of the hiring of a retired officer as a contract employee to assist with maintaining their current caseload.

The FAU provides the following services:

- Crime scene processing
- Firearm operational / function testing
- Bullet and cartridge comparison
- Ammunition examination
- Firearm characterization

The unit is housed on the second floor, south side of the BPD headquarters and contains several working spaces. There is an office with multiple analysts, an area for test-fires (including an adjacent room for remote viewing and for other purposes), a storage room for the storing of firearms as well as casings and ammunition, which contains an area with microscopes for examinations of casings. Currently, the area has capacity for 2 ½ years' worth of storage. There is also a separate office space for the IBIS analysts. Firearms are accepted at the window of the FAU for processing. The FAU test fires weapons in a small, confined area. There is an exhaust hood, however there is not a separate ventilation system to decrease lead particles in the atmosphere that may compromise the health of the examiners. Examiners use hearing protection when shooting. The laboratory has recently tested the examiners for lead exposure and hearing loss.

Over the last five years, the FAU processed an average of 1,273 cases per year and the current turnaround time for processing a case is approximately 100 days. Given the staffing shortage, the current backlog for 2022 is 58 operability cases and 210 comparisons.

For completed cases that were submitted in 2022:

Firearms Analysis

Turnaround time (TAT) = 40 days

Median TAT = 28 days

Case Range = 1 - 200 = ~199 days

As of information available in June 2022, the firearms unit identified a backlog of 268 cases, 210 of which are comparisons and 58 are operability cases.

Crime Scene Response Unit

The Boston Police Crime Scene Response Unit (CSRU) is overseen by a sworn officer, Lieutenant Detective Michael Connolly. The unit is not accredited. The unit is comprised entirely of sworn officers of different ranks. The unit works on three shifts and covers 365 days a year. There are currently 34 officers assigned to the CSRU. Training to work within this unit is six months long, with three months dedicated to crime scene processing and three months for fingerprinting.

The unit is housed on the first floor, south side of the BPD headquarters and contains several working spaces. There is an office with multiple computer workstations for officers to work. There is also a space for officers to lay out and examine evidence, as well as two garage bays for the processing of vehicles.

The CRSU responds to approximately 700 calls for service per year. The CSRU responds to major incidents and provides the following services:

- Crime scene documentation
- Major case fingerprints / fingerprint processing and verification to include arrests processed within the city limits and MBTA
- Evidence collection
- Autopsy documentation

The Crime Scene Response Unit responds to and is typically present at all crime scenes. Latent print documentation (collection/photography) is performed by CSRU for most scenes. Analysts of the Latent Print Unit may respond to a scene at the discretion of the investigator following a scene assessment per the CRSU Policy and Procedure Manual (Section 5.3.1).

Electronic Crimes Unit

The Boston Police Electronic Crimes Unit is overseen by a sworn officer, Sergeant Detective Timothy Laham. Sgt. Det. Laham is the only employee in the ECU that is not attached to a task force. The unit is not accredited. The unit is comprised of six sworn officers of different ranks. The Electronic Crimes Unit does not have a physical location inside BPD headquarters and thus

were not part of our audit. Multiple BPD officers are attached to various taskforces. Two officers are attached to the Secret Service, one to the FBI, and one to the Coast Guard. The examiners attend trainings on software specific topics before being allowed to examine a device containing that software. Due to not being housed as one unit, caseload and backload could not easily be determined. The examiners may be working on multiple devices at the same time, and the complexity of the device and extraction may determine the turn-around-time.

The Electronic Crimes Unit examines and processes:

- Mobile devices
- Storage devices
- Computers
- Network intrusion response
- Vehicle system forensics
- Skimmer forensics
- Drone forensics
- Cyber crime investigations support

3. Boston Police Crime Lab Operating Budget

Each unit director of the Forensic Division submits its own budgetary request through their chain of command and ultimately to the Superintendent of BIS. The budget is reviewed internally and is sent to City Hall for review as part of the overall BPD budget. The budget has been supplemented in the past by various grants that cover training, equipment and overtime costs. The operating budget does not cover personnel costs or overtime expenditures. The last two years of budget requests and allocations are as follows:

- Crime Lab
 - FY2021 - \$875,719 requested – awarded \$660,273 (75%)
 - FY2022 - \$599,167 requested – awarded \$610,061 (102%)
 - FY2023 - \$694,595 requested – awarded \$594,595 (86%)
- Latent Prints
 - FY2021 - \$266,768 requested – awarded \$89,317 (33%)
 - FY2022 - \$114,669 requested – awarded \$112,199 (98%)
 - FY2023 - \$118,415 requested – awarded \$118,415 (100%)
- Firearms Analysis Unit
 - FY2021 - \$200,941 requested – awarded \$109,841 (55%)
 - FY2022 - \$99,624 requested – awarded \$76,574 (76%)
 - FY2023 - \$134,330 requested – awarded \$134,330 (100%)
- Crime Scene Response Unit
 - FY2021 - \$332,000 requested – awarded \$304,383 (92%)
 - FY2022 - \$345,850 requested – awarded \$319,383 (92%)

- FY2023 - \$408,000 requested – awarded \$308,000 (75%)

4. Observations

It is apparent from the tour, presentation by laboratory director to the FSOB, and review of documents as well as accreditation materials that the Boston Police Forensic Division is producing quality work. The facility reviewed houses the Crime Laboratory, Latent Print, Firearm Analysis, and Crime Scene Response Units all at the 1 Schroeder Pl. headquarters building.

The Units require additional space, dedicated and designed to allow for appropriate processing and analysis of evidence based on their current caseload. Given the Units' workload and current staffing there is insufficient workspace and administrative areas to house each unit. The laboratory over the past few years has been forced to repeatedly modify existing space to meet their analytical and staffing needs. This has resulted in areas for analysis of the laboratory to be combined and may compromise the integrity of the evidence and quality of the analysis. Space that was previously used for conferences and/or meetings has been converted into multi-purpose spaces that are used for conferences, meetings, evidence re-examination, and storage. This has led to lack of sufficient space if multiple analysts, administrators, or when external stakeholders are present at the laboratory. Efforts to increase space have been made through the introduction of file digitization to reduce storage of paper documentation. The National Institute of Standards and Technology, states for a large laboratory from 70-110 staff size there should be 790-860 gross square feet (GSF) per staff member³. The laboratory current staff level of 95 employees working in a 15,000 square foot area results in 158 GSF per staff member.

5. Review of Audit Documents

Based on the presentations received from Director Kosiorek, the FSOB concluded that a review of existing quality and audit documents along with a tour of the facility would assist them with the audit of the BPD forensic units.

The FSOB reviewed the following documents:

- 1) Documentation submitted by the Boston Police Crime Lab to include, organizational charts, budget requests and/or approved budgets, standard operating procedures, equipment overviews, hiring guidelines, and training standards
- 2) PowerPoint overview presented by Director Kosiorek

³ NISTIR 7941 - National Institute of Standards and Technology (NIST) Forensic Laboratories: Handbook for Facility Planning, Design, Construction, and Moving; June 2013.

- 3) 2019, 2020, and 2021 Crime Lab Management Review Meeting Minutes
- 4) 2019 – 2020, 2020 – 2021, and 2021 – 2022 Firearms Unit Management Review Meeting Minutes
- 5) 2019 – 2020, 2020 – 2021, and 2021 – 2022 Latent Prints Unit Management Review Meeting Minutes

6. Recommendations

The FSOB has identified some key recommendations below for consideration:

1. The entire Division be accredited and all analysts certified as available. If not supported by current unions, management should work with the union leaders in order to strive to meet this recommendation.
2. A review of current space availability and evaluation of options to increase the laboratory working space to meet recommended gross square footage.
3. An attorney be attached to the Division who specializes in forensic sciences to assist with discovery motions, litigation packets, etc.
4. A civilian Director be placed as the Commander of the Forensic Division or equivalent position. The entire upper command structure is subject to routine rotation of sworn officers. Repeated turnover of critical upper management positions results in the loss of institutional knowledge, inconsistency in management and supervision, and creates gaps in knowledge of best practices in the field of forensics.
5. Efforts should be made to reduce turnover in the Firearms Unit where 2 years of training is required prior to the analyst's qualification.
6. Increased use of blind verification as part of friction ridge comparison to assist in reducing cognitive biases. Currently, it is only used for conflict resolution due to lack of personnel. It is important to note, however, that other verification techniques are currently in use. There is also an intent to schedule a refresher bias training in 2023 for staff.
7. Increased resources for training opportunities throughout the entire forensic services division, to include continuing education for certification maintenance, testimonial training, and advanced forensic techniques.
8. Expansion of grant funding pursuits, where applicable, to allow for replacement and/or purchase of upgraded equipment in a timely fashion to increase efficiency. The Boston Police Crime Lab has already made great strides in supplementing their approved budget through the successful awards of the Capacity Enhancement for Backlog Reduction (CEBR) grant program, and the Paul Coverdell Forensic Science Improvement Grants Program (Coverdell).

6. CONCLUSION

Throughout this audit, the team found that the Boston Police Forensic laboratories are providing quality and reliable services. To ensure the continued quality of forensic evidence analysis that the units of the forensic laboratories have demonstrated through this audit process, the organization must be proactive. The implementation of our recommendations will ensure the Boston Police Department continues to improve the quality of their forensic services provided to the Commonwealth.

The FSOB understands that it has been tasked with an important duty by the Legislature and intends on working diligently to accomplish its mandate and work to improve the forensic services in the Commonwealth where needed.