Self-Sustaining Science, Safer Streets

2018 ANNUAL REPORT

DISTRICT OF COLUMBIA
DFS
DEPARTMENT OF FORENSIC SCIENCES

WE ARE WASHINGTON DC
GOVERNMENT OF THE DISTRICT OF COLUMBIA
MURIEL BOWSER, MAYOR

Photo: Akil Muhangi, Forensic Scientist in the Digital Evidence Unit (DEU) – the fastest growing field in forensic sciences.

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LETTER FROM THE MAYOR

Dear Resident:

My second oath of office as Mayor of this great city has renewed my commitment to making our streets safer and stronger. The Department of Forensic Sciences (DFS) is an integral partner in this effort, demonstrating the leadership and scientific rigor necessary to be completely independent and self-reliant in delivering accurate, relevant and timely forensic science that impacts crime and public health challenges that threaten our city.

DFS is an internationally accredited forensic laboratory system that provides services to District agencies including the Metropolitan Police Department (MPD), the Office of the Chief Medical Examiner, the Office of the Attorney General, the Department of Health, the Fire and Emergency Medical Services Department, as well as to other law enforcement and investigative agencies. Over the past six years, scientists and technicians at DFS have been working relentlessly and round-the-clock to conduct the necessary evidence testing that leads to the arrest and conviction of criminals and supports exonerating those that may have been wrongfully accused. It is this level of proficiency and execution that demonstrates DFS' ability to deliver forensic testing without the use of and support from federal laboratories such as the Federal Bureau of Investigation, the Drug Enforcement Administration or the Bureau of Alcohol, Tobacco, Firearms and Explosives.

DFS also serves as a satellite laboratory for the US Center for Disease Control and Prevention. Through the Public Health Laboratory, DFS scientists conduct critical, life-saving research and surveillance that protects DC residents and visitors from epidemics (e.g., monitoring mosquitoes for viruses such as West Nile and Zika and preventing the spread of rabies).

During Fiscal Year 2018, DFS implemented a range of strategic initiatives and delivered on a host of performance measures that fortified their independence. Measures of success include: confirming evidence submissions and prioritizing forensic examination requests as part of my Summer Crime Initiative, an effort designed to reduce the 40% spike in gun violence experienced during the summer of 2018; working to address the increase in drug overdoses in the District by identifying two new synthetic cannabinoids (K2) during the summer uptick in K2 use; and being strong partners with the MPD in building a stronger, safer DC through the District's Fair Shot Initiative and its significant investment in and prioritization of public safety.

I stand behind this agency and my entire Administration as we work collectively to keep DC residents and visitors safe from crime and from public health problems. I am confident that our synergy, commitment, and strong leadership will continue to make the District of Columbia an ideal place to live, work and visit.

Please enjoy DFS' 2018 synopsis of "Self-Sustaining Science, Safer Streets."

Sincerely,

Muriel Bowser

Muriel Bowser
Mayor

LETTER FROM THE DIRECTOR

Dear Resident:

The Department of Forensic Sciences (DFS) oversees your laboratories and is staffed by a diverse team of professionals who use science every day to make you safer. From addressing the tiniest flu germ, to helping track the interstate movement of crime guns and illegal drugs, DFS works to identify and help remediate threats to the safety and well-being of your friends and neighbors. Our guiding principle for Fiscal Year 2018 (FY18) captures our goals in a single phrase: Self-Sustaining Science, Safer Streets.

FY18 marks our 6th year as an agency. The DC City Council established DFS in 2011, as the first major city forensic laboratory not under the direction of a law enforcement agency. Shortly after taking office in 2015, Mayor Muriel Bowser doubled the agency's resources, and has continued to expand DFS' ability to put cutting-edge science to work for the safety of you and your neighbors. DFS' independence continues to grow, taking on greater responsibility for DC's public safety, and reducing dependence on federal agencies. Thanks to new technical capacities and accreditations in FY18, DFS now exercises full control over forensic science efforts in the nation's capital. Not only are we independently capable of meeting all of the District's forensic science needs, but we are also able to make our own contributions to the field. Our research has wide-reaching and important impacts on the accuracy and reliability of criminal investigation and prosecution, public health and homeland security.

According to our statutory mission statement, DFS is to provide high-quality, timely, accurate and reliable forensic science services using best practices and the best available technology, with a focus on unbiased science and transparency, toward the goal of enhancing public safety. Put more simply, it is our job to make you safer by ensuring we use the best scientists and equipment to process the evidence we receive. To ensure we accomplish this mission, we have a dedicated Science Advisory Board (SAB) whose sole purpose is to ensure our science stays as strong as the current state-of-the-art permits.

The DFS SAB consists of highly-qualified scientists appointed by Mayor Bowser and responsible for advising on our technical operating procedures. In FY18, our SAB welcomed four new members to the existing five-member Board: Danielle O'Neil, John Paul Jones, Robert Thompson and Dr. Michael Pentella. SAB met four times in FY18, reviewing all DFS protocols, publishing three statements that formed its independent response to the President's Council of Advisors on Science and Technology's (PCAST) report on potential concerns in some of the nation's forensic science labs and confirming that DFS policies and procedures fully alleviate such concerns through technical rigor and quality control.

Along with SAB, outside auditors helped DFS accomplish its mission by holding our scientists accountable at all times—even through unannounced or surprise audits—for impartiality, traceability, reproducibility, transparency, responsibility and the utmost quality control. In FY18, DFS' Quality team successfully led the agency through all of its external audits. Our newly opened Forensic Chemistry Unit (FCU) received ISO/IEC 17025 accreditation, and now carries full responsibility for processing all federal drug cases in the District. Our Digital Evidence Unit (DEU) underwent a similar on-site inspection by an outside auditor in FY18 and became one of the only accredited digital evidence labs in the country.

> *When I go and ask the chief and detectives, 'What's the difference,' expecting them to talk first about police… they actually first talk about, 'Well, they have a lot more physical evidence to use in cases' and their evidence, when it goes to court, has much stronger testimony from the scientists that are testing it.*
>
> **KEVIN DONAHUE**
> *Deputy Mayor for Public Safety*

DFS made significant strides in FY18 that have also boosted our profile and credibility among local agencies and city officials. In a recent WTOP news story, Deputy Mayor for Public Safety Kevin Donahue applauded DFS' work in helping to bring the city well above the national average in closing violent crime cases:

"When I go and ask the chief and detectives, 'What's the difference,' expecting them to talk first about police… they actually first talk about, 'Well, they have a lot more physical evidence to use in cases' and their evidence, when it goes to court, has much stronger testimony from the scientists that are testing it."

FY18 was a great year for DFS' Public Health Laboratory (PHL). With a resident population exceeding 700,000 individuals, and as an ever-growing hub of political and commercial activity, the District's monitoring of and response to infectious disease is a matter of global importance. Our PHL is positioned at the forefront of this fight, researching and maintaining surveillance of influenza strains, rabies and various mosquito-borne viruses. In addition to PHL's drug identification work and its direct role in the criminal justice system, our chemists helped to minimize the harm done by illegal drugs in our community by keeping a close eye on what illegal drugs found their way into the District. In FY18, chemists at PHL discovered two new synthetic cannabinoids, which—unlike traditional marijuana—are deadly designer drugs that carry a real risk of dangerous overdose.

Our Crime Scene Sciences Division (CSS) spent FY18 responding to scenes, collecting evidence and keeping it secure as it awaited testing. With the addition of forensic chemistry to DFS' capabilities, CSS adapted its own infrastructure through new training opportunities and utilization of additional personal protective equipment to develop our ability to receive and secure a large volume of controlled and dangerous substances. We continued to add to our numbers by bringing in experienced crime scene scientists, and by training our own scientists and technicians from the ground up, providing local women and men with the opportunity to join in the work of making our community safer.

FY18 brought significant outside recognition to our Forensic Science Laboratory (FSL), a division comprised of five units: Firearms Examination Unit (FEU), Latent Fingerprint Unit (LFU), Forensic Intelligence Unit (FIU), DEU and the Forensic Biology Unit (FBU). Our DEU was

acknowledged for excellence in the “Manual of Forensic Science: An International Survey,” an important textbook in the field, as well as in the National Institute of Justice’s listening session on the digital evidence community’s emerging needs. Data produced by FBU was published in the leading professional journal, *Forensic Science International: Genetics*. Our FIU collaborated with the Metropolitan Police Department’s (MPD) Investigative Services Branch to track the criminal justice impact of evidence processed by DFS. Lastly, our FEU helped further streamline processes for the National Integrated Ballistic Information Network (NIBIN), the database that law enforcement uses to identify perpetrators, link criminal activities and identify sources of crime guns for immediate disruption, investigation and prosecution.

Thanks to the DC City Council’s and Mayor Bowser’s continued investment in the people of DFS, the tools they use, and techniques available to them, in FY18 the agency helped to make the District a safer place than it otherwise would be. On behalf of DFS, I would like to thank Mayor Bowser and the DC City Council for nearly doubling our resources under Mayor Bowser’s leadership. This level of funding and operational support demonstrates the city’s deep commitment to public safety, and its faith in objective, repeatable and rigorously refined science. We also acknowledge the support of Deputy Mayor Kevin Donahue, and our federal and local partners. Without their support, your labs here at DFS could not have reached their full potential in FY18 and would not be so well positioned to get even more done in FY19. We appreciate all that you and your neighbors have invested in our work. We are proud to have this opportunity to share our FY18 annual report with you, and to demonstrate that Self-Sustaining Science leads to Safer Streets.

Sincerely,

Jenifer Smith, Ph.D.
Director

OPERATIONS

> On behalf of the Director, DFS' Operations team provides high-level oversight and support to each division within the agency: CSS, FSL, PHL and the Training and Quality team.

We work to ensure that our services, internal processes and systems, as well as our human and financial resources are properly managed and allocated.

Our goal is to make certain the agency functions with the highest degree of quality and efficiency to best serve District residents. The Office of the General Counsel (OGC), another vital aspect of our operations, responds to over 1,000 discovery requests each year in addition to handling Freedom of Information Act requests and labor relations. The OGC created the Labor Management Forum, a group of management and union leaders who meet monthly to talk through anticipated policy changes, procedural improvements or workforce issues.

Operations is charged with purchasing and budgeting, employee health and safety, human resources, information technology, performance management oversight and implementation of cross-cutting initiatives that impact the entire organization. Below are our FY18 workload measures and major accomplishments by area of responsibility:

OPERATIONS WORKLOAD MEASURES

Human Resources (Number of employees on-boarded):	**40**
Forensic Information Technology (Number of IT service requests received):	**3,479**

OPERATIONS ACCOMPLISHMENTS

PURCHASING AND BUDGETING

Identifying and securing funds to better serve residents: Each year DFS receives local government support to provide forensic science services to District agencies as well as residents. We also work to identify alternative funding sources, such as federal government grants, that target specific forensic science and public health issues. In FY18, DFS obtained support to establish and supplement efforts to focus on the national opioid crisis. We also secured $5,893,044 in federal grants to pay for specialized reagents, scientists' salaries and other items to conduct our work. In addition, and in support of our future laboratory needs, DFS established the Department of Forensic Science Laboratory Fund.

> *This fund will allow DFS, in the out years, to retain revenue from forensic testing for customers, as well as payments from federal and regional government partners for forensic services rendered.*

Facilitating budget enhancements that strengthen operations: Our Operations team facilitated several major budget enhancements in FY18. We allocated $2,907,840 to hire and retain 22 crime science scientists, a decision that freed up MPD officers to focus solely on police rather than forensic crime scene duties. We allocated funding to hire two forensic chemists tasked with planning for how DFS would independently assume responsibility for the District's drug testing from the US Drug Enforcement Agency (DEA), a shift that enables the District to place its own priorities on drug testing versus those enforced by DEA. Operations also allocated $340,000 and $1,000,000 respectively to meet the current operating and future capital fund appropriations needed to address the increasing digital storage requirements and demands faced by our agency. Finally, we established, for the first time ever, a $500,000 capital equipment budget to purchase new laboratory equipment and instruments.

Supporting small and local business development: DFS continues to seek efficiencies wherever possible, as our goal is to provide the District with the best value for its money. We implemented measures that reduced the overall number of procurement actions from 364 in FY17 to 290 requisitions submitted to the Office of Contracting and Procurement in FY18. We consolidated our procurement process for commonly purchased office supplies, laboratory chemicals and reagents and personal protective equipment, and spent $1,627,074.40 with small and local businesses achieving our goal to make 50 percent of eligible purchases through DC-based businesses.

Initiating a sole-source contract to save time and money: DFS operates with a high degree of scientific rigor and autonomy. To maintain relevant accreditations and to enhance overall public safety and trust, we use the latest in scientific instrumentation for measurement and testing. In FY18, DFS negotiated one contract to address the maintenance and repair of numerous pieces of equipment and instruments that were previously under individual service contracts. Establishing this sole-source contract resulted in considerable time and cost savings for DFS.

HUMAN RESOURCES

Attracting the right talent for the agency: Despite a high profile in the media and in popular fiction, forensic science and public health are extremely challenging and highly competitive fields to find and recruit qualified candidates. In FY18, DFS implemented several successful outreach efforts resulting in 40 new hires, including two veterans and our new CSS Division Director.

INFORMATION TECHNOLOGY

Improving our systems to facilitate ongoing work: The Forensic Technologies Unit (FTU) is housed within the Operations team and manages several vital and highly-specialized systems that support the work of our agency. This year, FTU implemented a large-scale infrastructure upgrade with little to no disruption to system availability, allowing scientists to continue their critical work. FTU also upgraded core case management and evidence analysis systems, again with minimal disruption. In FY18, the FTU team processed 3,479 requests for service from within the agency.

CROSS-CUTTING INITIATIVES

Being recognized for overtime auditing process: In FY18, DFS received a District-wide overtime audit report from the DC Auditor highlighting our innovative electronic overtime approval and tracking system, one that could serve as a District-wide model to improve internal controls. The DC Auditor also commended DFS on our efforts to address challenges that arose during the auditing process.

Participating in the National Level Exercise: In April, a full year after the development of our Continuity of Operations Plan (COOP), DFS worked in conjunction with DC Homeland Security Emergency Management Agency (HSEMA) partners, the Protective Services Division (PSD), DC Department of General Services (DGS) facilities staff and the Office of the Chief Medical Examiner (OCME) to successfully test the COOP.

CRIME SCENE SCIENCES DIVISION (CSS)

CSS plays a vital role in the District's response to crime and crime scenes. Our scientists work to preserve evidence at, or as close as possible to its original state until it can be recorded and brought back to the laboratory for analysis.

The CSS team consists of 80 specially trained individuals, 16 of whom were hired in FY18, including the division's new leader, retired MPD Commander Christopher LoJacono. Diverse backgrounds such as law enforcement, forensic laboratory technicians, civilian crime scene technicians and property technicians are this team's strength.

When crimes occur, there are often hundreds, if not thousands, of pieces of evidence (e.g., blood, fingerprints, weapons, cartridge casings and clothing) that must be collected and preserved for later analysis. Adapting to account for each type of evidence and crime scene, crime scene scientists use their expertise, knowledge and best practices to identify probative evidence. Once identified, CSS personnel thoroughly document, collect and preserve the evidence to keep it from degrading or changing over time. To gain greater clarity on what occurred during a crime, the evidence must be viewed within the context in which the crime took place, and the integrity of the evidence must not be compromised.

CSS, along with other DFS scientists, lend their expertise and assistance to other stakeholders such as MPD and OCME in the role of force multipliers during major incidents such as mass fatalities or other catastrophes. In FY18, DFS personnel participated in six multi-agency, large-scale, complex crime scene exercises and drills (e.g., forensic investigation, mass casualties, victim identifications and family assistance) designed to keep our scientists and technicians adequately prepared to respond. We also participated in over 15 outreach events to foster community awareness and to educate students about the work of our division.

CENTRAL EVIDENCE UNIT (CEU) WORKLOAD MEASURES

Providing an invaluable resource to MPD's Evidence Control Branch, CEU received 74,360 pieces of evidence in FY18, a 6.8 percent increase over FY17 totals. Evidence is collected from crime scenes across the District and brought to our unit for evaluation.

CSS provides high-quality, round-the-clock support through its two units—the Central Evidence Unit (CEU) and the Crime Scene Sciences Unit (CSSU).

Here are the most common evidence types and quantities of evidence received by CEU:

- Cartridge casings: **15,633**
- Fingerprints (lift card/photo): **13,230**
- Bullets/projectiles: **4,779**
- Clothing: **4,505**
- Vehicle swabs: **2,749**
- Buccal (cheek) swabs: **1,495**
- Cartridges: **2,266**
- Firearms: **2,000**
- Swabs (general): **1,808**
- Narcotics/drugs: **1,567**

CENTRAL EVIDENCE UNIT (CEU) ACCOMPLISHMENTS

Ensuring the safe remediation of phencyclidine (PCP): Through a collaborative effort with the MPD Narcotics and Special Investigations Division and FCU, in FY18 CEU implemented a process that ensures the safe remediation of seized PCP.

Eliminating backlogs: CEU eliminated the backlog of 1,000 firearms in the storage vault and significantly reduced the backlog of stored buccal swabs from approximately 20,000 down to 4,500.

CRIME SCENE SCIENCES UNIT (CSSU) WORKLOAD MEASURES

CSSU independently processed 5,879 crime scenes and received 9,227 service requests in FY18. *Below is a breakdown of CSSU's activity by quarter.*

CRIME SCENE SCIENCES UNIT (CSSU) ACCOMPLISHMENTS

Earning International Association for Identification (IAI) certification: Twenty forensic scientists earned certification through IAI, the largest and oldest forensic organization worldwide. Certification involves experience in and testing of the relevant knowledge, skills and abilities required for scientists to be self-reliant in crime scene investigation/analysis.

Receiving training on Leica: One hundred percent of CSSU personnel were trained on Leica 3D laser-scanning and imaging equipment, the most advanced tool used today for creating a 3D digital reproduction of a crime scene.

Completing continuing education training: CSSU staff completed over 1,500 hours of continuing education training.

BREAKDOWN OF CSS ACTIVITY BY QUARTER

CEU MEASURES	FY18 Q1	FY18 Q2	FY18 Q3	FY18 Q4	FY18 TOTALS
NUMBER OF EVIDENCE ITEMS RECEIVED (CEU)	17,575	17,230	19,375	20,180	74,360
NUMBER OF CRIME SCENES SERVICE REQUESTS	2,054	2,064	2,473	2,636	9,227

FORENSIC SCIENCE LABORATORY (FSL)

At the core of our agency is a commitment to providing high-quality, timely, accurate and self-reliant forensic science services using best practices and the best available technology.

Comprised of five units—FEU, LFU, FIU, DEU and FBU—FSL's processes thousands of requests every year.

FSL has a particularly unique charge in support of our organizational thrust because we house the largest laboratory within DFS and provide a comprehensive set of services involving the collection, examination, analysis and reporting of physical evidence submitted in criminal cases. FSL is authorized to independently examine evidence submitted by any DC governmental agency investigating a criminal offense. Federal agencies, such as the US Park Police, are also able to use the services of FSL.

FORENSIC INTELLIGENCE UNIT (FIU)

FIU is charged with ensuring that evidence submitted to FSL is prioritized, subjected to all appropriate testing and reported in a timely and efficient manner. FIU acts as a statistical review board of sorts, following FSL's testing and reports through their return to DFS stakeholder agencies and tracking their effects and impacts in the criminal justice process. FIU performs statistical analyses of these effects and impacts to ensure FSL's resources are being appropriately deployed in support of District residents.

Formed in FY17, FIU undertook an FY18 strategic initiative to examine the impact of forensic intelligence reports in the criminal justice process. While progress is still underway in this area, FIU was successful in tracking daily offenses, confirming evidence submissions to DFS, as well as prioritizing forensic examination requests.

FORENSIC INTELLIGENCE UNIT (FIU) WORKLOAD MEASURES

FIU received and processed a total of 3,926 requests from key stakeholder agencies, 200 more requests than last fiscal year. This unit provides an invaluable service to the following agencies: MPD, the United States Attorney's Office (USAO), the Office of the Attorney General for the District of Columbia (OAG), the Office of the Inspector General for the District of Columbia (OIG) and other entities including the United States Park Police, the Naval Criminal Investigative Service, the Federal Protective Service and the Metro Transit Police Department.

Below, FIU's FY18 requests for testing are broken out by unit, illustrating the relative volume of requests passed on to each unit:

CUSTOMER REQUESTS

FY18	FBU	FEU	LFU	DEU	CHEM LAB	TOTAL
MPD	1,498	215	752	401	82	2,948
USAO	598	44	205	20	22	889
OAG	19	5	10	4	2	40
OIG	0	0	3	6	0	9
OTHERS	8	1	17	7	7	40
TOTAL	2,123	265	987	438	113	**3,926**

Though 3,926 customer requests were received and processed, many more forensic testing services were proactively completed without the need for a customer request. FSL automatically initiates forensic processing of all firearms and related evidence as depicted in the below chart, in addition to handling of all customer-generated requests:

PROACTIVE TESTING

FY18	TEST FIRES	FIREARM ANALYSIS	CHEM LAB	LATENT ANALYSIS
FEU	1,891	757	0	0
LFU	0	0	887	2,972

FORENSIC INTELLIGENCE UNIT (FIU) ACCOMPLISHMENTS

Supporting the Mayor's FY18 Summer Crime Initiative (SCI): In FY18, Mayor Bowser continued her strong support of the District's SCI, a coordinated effort to reduce and eventually eliminate violent crime, remove dangerous illegal guns from our neighborhood streets and hold repeat violent offenders accountable. In FY18, this strategic prevention effort focused enforcement in specific areas across the District and yielded double-digit decreases in robberies, assaults with deadly weapons and overall crime (both violent and property). FIU's contributions to this effort involved tracking daily offenses, confirming evidence submissions to DFS, as well as prioritizing forensic examination requests and collating analyzed information into viable intelligence.

Performing major cases tracking: In FY18, FIU supported critical reviews, such as MPD's TOPS Open District Homicides and Cap STAT on Violent Crime that focused on major cases involving violent offenses. Additionally, FIU supported case reviews following periods of increased violent crimes as occurred during the 2018 Memorial Day weekend spike in violent offenses involving guns. FIU was able to determine linkages between offenses that occurred during that period and those linked through DNA tests or through NIBIN, a database that allows scientists to upload and check digital images of fired bullets and cartridge casings against similar images uploaded by other forensics laboratories nationwide.

Analyzing intelligence impact: FIU and the MPD Investigative Services Branch collaborated to determine the criminal justice impact of various pieces of forensic evidence. Impact, in these cases, is defined by evidence that leads to an arrest, confirmation of an arrestee or provides an investigative lead.

Automated Fingerprint Identification System (AFIS): FIU analyzed 1,362 latent print identifications made by LFU through AFIS, a biometric database that uses digital imaging technology to obtain, store and analyze fingerprint data to determine impact. More than 70 percent of those AFIS identifications had a criminal justice impact.

Combined DNA Index System (CODIS): FBU scientists use CODIS to search DNA profiles to possibly link violent crimes to each other and to known offenders. CODIS yielded 329 hits or matches for offenses ranging from robberies, carjacking and property crimes to sex cases, assaults and incidences that resulted in death. Of these hits, FIU determined that more than 90 percent had a criminal justice impact.

National Integrated Ballistic Information Network (NIBIN): There were also outcomes of forensic intelligence linking NIBIN hits to MPD cases. Of the 834 NIBIN hits produced by FEU, 93 percent (772 hits) linked MPD cases to each other, and the remaining 7 percent (62 NIBIN hits) linked MPD cases to outside jurisdictions, namely in Maryland.

DIGITAL EVIDENCE UNIT (DEU)

Responsible for extracting and analyzing seized digital evidence from nearly any device (e.g., smart phones, personal computers, vehicles, credit card skimmers and video), our DEU scientists utilize evolving techniques in digital forensics in order to obtain data from devices that are part of crime scenes. DEU also examines the digital landscape for cases involving malware, unauthorized network intrusions and data breaches. In FY18, DEU acquired the capability to unlock the most secure smart phones, and in the process, literally unlocked a world of data access that was previously unattainable. Our lab is one of the first in the country to acquire this capability.

DIGITAL EVIDENCE UNIT (DEU) KEY PERFORMANCE INDICATORS

DEU consistently performed at 100 percent for quarterly processing of priority and homicide cases marked in the Laboratory Information Management System (LIMS) and completed within 60 days.

KEY PERFORMANCE INDICATORS

DEU KEY PERFORMANCE INDICATORS	FY18 Q1	FY18 Q2	FY18 Q3	FY18 Q4	TARGET
Percentage of priority cases as designated by the contributor and marked in LIMS completed within 60 days from the date the analyst was assigned the case	100%	100%	100%	100%	90%
Percentage of requested homicide cases completed within 60 days from the date the analyst was assigned the case	100%	100%	100%	100%	90%

DIGITAL EVIDENCE UNIT (DEU) CASE STATISTICS

The following case statistics demonstrated DEU's growth over a short period of time. Each year, DEU experiences significant increases in caseload. In FY18, DEU experienced a 61 percent increase in caseload over FY17.

DEU CASEWORK

YEAR	CASE LOAD	TAT
2014-2015	23	N/A
2016	98	N/A FOR ANNUAL
2017	394	4.59
2018	636	5.2

DIGITAL EVIDENCE UNIT (DEU) ACCOMPLISHMENTS

Embracing new techniques that increase access to digital data: In FY18, DEU used two new techniques to provide greater access to digital data. One technique, called re-balling, involves replacing silicon "dots" on damaged cellphone chips to retrieve data from the chip itself. In FY18, DEU performed its first "re-ball" of a chip with success. DEU also used Board Transplant, another data retrieval technique involving replacing the entire board in a cell phone, in order to power on and retrieve data.

Being acknowledged for scientific excellence and research: DEU scientists and their research were recognized across local, national and international forums including: the National Institute of Justice "Listening Session" on the digital evidence community's emerging needs, the U.S. Chamber of Commerce's National Institute of Standards and Technology's paper "Digital Evidence Preservation," the Investigative Forensics Program at the University of Maryland, University College and a team member was elected as committee chair on the Scientific Working Group on Digital Evidence.

FIREARMS EXAMINATION UNIT (FEU)

Firearms are used in various types of crimes including rape, robberies, homicides and assaults. It is the job of FEU to examine and compare firearms as well as the tool marks left when a harder object encounters a softer object. This vital unit can evaluate the functionality of firearms, determine the distance from muzzle to target and microscopically compare bullets and cartridge cases to determine the possible source for firing.

FEU's FY18 target was to process 90 percent of received samples related to priority and homicide cases within 60 days from the date the analyst was assigned the case. FEU exceeded this target, consistently performing at 100 percent for priority and 95 percent or better for homicide cases.

KEY PERFORMANCE INDICATORS

FEU KEY PERFORMANCE INDICATORS	FY18 Q1	FY18 Q2	FY18 Q3	FY18 Q4	TARGET
Percentage of priority cases as designated by the contributor and marked in LIMS completed within 60 days from the date the analyst was assigned the case	100%	100%	100%	100%	90%
Percentage of requested homicide cases completed within 60 days from the date the analyst was assigned the case	96%	95%	100%	100%	90%

FIREARMS EXAMINATION UNIT (FEU) WORKLOAD MEASURES

FEU utilizes the NIBIN system to provide leads in shooting-related investigations. NIBIN is a 3D automated ballistics imaging and analysis system that populates a database of digital ballistic images of cartridge cases. The system identifies potential leads, which is used by forensic scientists to confirm NIBIN hits. In 2018, FEU entered a total of 3,667 cartridge cases into the system, generating 834 confirmed NIBIN hits. FEU also test fired 1,981 firearms. Below is the quarterly breakdown of entries, hits and firearms test fired:

WORKLOAD MEASURES

FEU MEASURES	FY18 Q1	FY18 Q2	FY18 Q3	FY18 Q4	FY18 TOTAL
NIBIN ENTRIES	930	843	1,003	891	3,667
NIBIN HITS	118	211	265	240	834
FIREARMS TEST FIRED	510	484	536	451	1,981

FIREARMS EXAMINATION UNIT (FEU) ACCOMPLISHMENTS

Leveraging the Crime Gun Intelligence Center (CGIC) Grant for additional impact: In FY17, FEU was sub-awarded a CGIC grant for approximately $500,000 to hire additional personnel who helped to streamline utilization of the NIBIN system. This intergovernmental, multidisciplinary initiative supports agencies in their efforts to more rapidly identify perpetrators, link criminal activities and identify sources of crime guns for immediate disruption, investigation and prosecution. Due to efficient use of funds in FY18, the award will continue to support the unit through FY19.

Dynamically responding to and timely reporting out exigent cases: During the Memorial Day weekend, FEU completed 26 cases within two weeks and generated 29 confirmed NIBIN hits. Similarly, during a homicide that occurred in October 2018, FEU spent the weekend hard at work and turned around microscopic results within the first 24 hours. This effort involved a request to compare the firearm used in the crime against the cartridge cases found on the homicide scene, a full microscopic examination and a final report to MPD sharing the results the following day.

FORENSIC BIOLOGY UNIT (FBU)

FBU continued to improve its biological tissue and sample testing (e.g., blood, skin and semen for genetic characteristics), surpassing their prior year performance levels for the second year running. In FY18, DFS received 268 sexual assault kits from MPD and tested 268 of them with an average turnaround time of 65 days. Of these, 264 kits were completed within the 90 days according to section 202(b) of the Sexual Assault Victims' Rights Amendment Act (SAVRAA). Of the four kits completed outside the 90 days allotted, however, all were subject to lengthy Permission to Consume concerns, which require FBU to delay the start of testing until specific approvals are obtained from authorities outside DFS. FBU increased in-house DNA testing capacity as demonstrated by completing 100 percent of sexual assault kits in house (without the use of outside laboratories) and exceeding the targets of 50 percent for in-house testing of all submissions for testing in Q1-Q3. This represents more than double the in-house case output FBU achieved in FY17. This was accomplished through the development of team testing, improved administrative workflows, establishment of daily huddles and an increased number of trained scientists.

FORENSIC BIOLOGY UNIT (FBU) KEY PERFORMANCE INDICATORS

FBU performed at 98 percent or better with respect to processing priority cases within 60 days, and 95 percent or greater when handling homicide cases.

KEY PERFORMANCE INDICATORS

FBU KEY PERFORMANCE INDICATORS	FY18 Q1	FY18 Q2	FY18 Q3	FY18 Q4	TARGET
Percentage of priority cases as designated by the contributor and marked in LIMS completed within 60 days from the date the analyst was assigned the case	100%	100%	100%	98%	90%
Percentage of requested homicide cases completed within 60 days from the date the analyst was assigned the case	100%	100%	95%	100%	90%

FORENSIC BIOLOGY UNIT (FBU) WORKLOAD MEASURES

FBU uses CODIS to search DNA profiles to possibly link violent crimes to each other and to known offenders. In FY18, FBU completed 581 CODIS entries and obtained 209 hits.

WORKLOAD MEASURES

FBU MEASURES	FY18 Q1	FY18 Q2	FY18 Q3	FY18 Q4	FY18 TOTAL
NUMBER OF CODIS DATABASE ENTRIES	185	139	128	129	581
NUMBER OF CODIS DATABASE HITS	54	53	41	61	209

FORENSIC BIOLOGY UNIT (FBU) ACCOMPLISHMENTS

Contributing to the validation of new technologies: Data produced by FBU was published in the May 2018 volume of the internationally-recognized professional journal *Forensic Science International: Genetics*. This article was a multi-laboratory response to erroneous reporting by the PCAST about the use of DNA interpretation software called STRmix currently in use at DFS. By obtaining publication of DFS validation data, along with other leading members in the field, this supports the use of revolutionary technology in the forensic DNA field.

Assisting with the US Government Accountability Office's (GAO) review of forensic DNA testing: GAO, an independent, non-partisan agency that works for Congress, requested to visit DFS to learn more about forensic DNA testing and impact assessment. FBU hosted approximately 20 GAO members for a four-hour presentation about DNA testing, interpretation, CODIS and funding pressures. A subset of these members re-visited DFS to get a tour and overview of all FSL units.

Validating Next Generation Sequencing (NGS) for FY19 implementation: FBU initiated a contract with an external vendor to validate and implement NGS. The goal of this partnership is to use powerful DNA technology to continue current capabilities and provide bio-ancestry and phenotypic information to investigators. This project builds on our 2017 submission to the FBI for consideration to use this technology in the National DNA Index System. If approved, FBU will likely be the first crime laboratory in the U.S. to fully implement NGS on criminal casework.

LATENT FINGERPRINT UNIT (LFU)

LFU analysts examine unknown or latent fingerprints and palm prints collected from items of evidence to determine their value. Suitable latent prints are then compared to known fingerprints to try and determine their source. Latent prints may be entered into AFIS, a biometric database that uses digital imaging technology to obtain, store and analyze fingerprint data. Latent prints are searched against stored known prints, and possible source candidates are generated and examined by LFU analysts. AFIS results have helped in producing intelligence leads for several DFS customers.

LATENT FINGERPRINT UNIT (LFU) KEY PERFORMANCE INDICATORS

LFU's performance target for FY18 was to handle priority and homicide cases within 60 days. LFU far exceeded the 90 percent standard and consistently performed at 100 percent with respect to priority and homicide cases completed within the stated timeframe, for each quarter of the year.

KEY PERFORMANCE INDICATORS

LFU KEY PERFORMANCE INDICATORS	FY18 Q1	FY18 Q2	FY18 Q3	FY18 Q4	FY18 TOTAL
Percentage of priority cases as designated by the contributor and marked in LIMS completed within 60 days from the date the analyst was assigned the case	100%	100%	100%	100%	90%
Percentage of requested homicide cases completed within 60 days from the date the analyst was assigned the case	100%	100%	95%	100%	90%

LATENT FINGERPRINT UNIT (LFU) WORKLOAD MEASURES

The collection and entry of latent fingerprints into AFIS is an integral function of LFU. The division maintained its threshold for high levels of entries for two years running. In FY18, LFU entered a total of 9,264 entries into AFIS and made a total of 2,110 hits tied to other criminal investigations. Below, AFIS entries and hits are broken down by quarter:

WORKLOAD MEASURES

LFU MEASURES	FY18 Q1	FY18 Q2	FY18 Q3	FY18 Q4	FY18 TOTAL
AFIS ENTRIES	2,798	2,164	2,230	2,072	9,264
AFIS HITS	661	496	462	491	2,110

LATENT FINGERPRINT UNIT (LFU) ACCOMPLISHMENTS

Managing the transition of initial evidence processing to LFU: Among the first steps in processing any physical evidence recovered from a scene is the preservation and documentation of delicate fingerprint and other identifying marks which can be destroyed or damaged by excessive handling. In FY18, responsibility for this initial evidence processing and preservation successfully transitioned from CSSU to LFU through a pilot program. As part of the program, LFU employed three additional full-time analysts, identified new technology and reagents and redesigned its Latent Print Processing Laboratory.

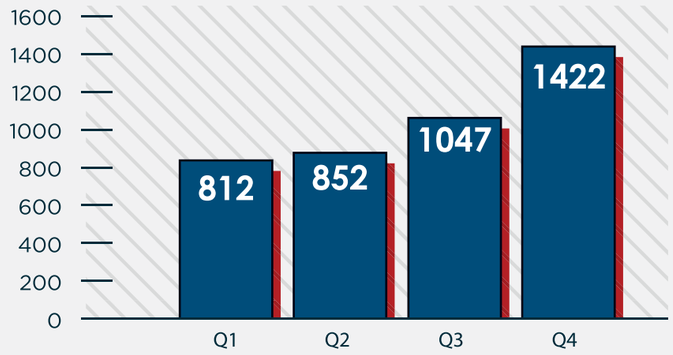
Managing casework to achieve zero backlog: LFU processed over 1,500 requests in FY18 alone and currently has no pending requests pre-dating FY19, and zero backlog.

PUBLIC HEALTH LABORATORY (PHL)

PHL performed a total of 4,133 tests on samples received in FY18, a total of 167 proficiency tests and a total of 38 validation efforts to bring on new tests. Below is a breakdown of the number of tests performed by quarter:

NUMBER OF TESTS PERFORMED BY QUARTER

PHL is responsible for thoroughly testing samples of various materials for bacterial and viral infections, heavy metals, toxic or volatile materials and other hazards to public health and safety.



PHL provides clinical diagnostic testing, disease surveillance, emergency response support, applied research, laboratory training and other essential services through its six units: *Accessioning Unit (ASU), Microbiology Unit (MBU), Biomonitoring and Analytical Chemistry Unit (BACU), Immunology Virology Unit (IVU), Molecular Diagnostic Unit (MDU), and the newly opened FCU.*

After receiving ISO/IEC 17025 accreditation, securing the necessary funding and establishing proof of concept for the program, our FCU began assuming full responsibility for processing all federal drug cases in the District from the DEA. FCU is now fully equipped to independently process and test drug evidence in the same facility, greatly increasing our ability to get timely and accurate information out to the public.

Working within the Laboratory Response Network for Chemical Threats, and closely with MPD and DC Fire and Emergency Medical Services Department, has allowed FCU to conduct critical investigations on drug impurities, support knowledge sharing with law enforcement regarding fentanyl, streamline synthetic opioid detection in syringes for OCME and begin screening controlled buys within the District to gain an upper hand in detecting emerging drugs.

Since its opening in April 2018, FCU has already been nationally recognized for its exemplary working relationships with its public safety counterparts. In fact, the PHL received the Centers for Disease Control and Prevention (CDC) "Innovative Collaborations with First Responder Communities" award.

PUBLIC HEALTH LABORATORY (PHL) KEY ACCOMPLISHMENTS:

Major increases in influenza sample testing volume: The number of influenza samples tested at our PHL increased nearly 700 percent in FY18. PHL subtypes influenza, which provides key information to both CDC and DC Health. This information is used to better understand the different types of influenza viruses circulating in the District and provides insights into the creation of next year's flu vaccine. In FY18, PHL tested 558 samples for influenza, this is up from 80 the previous year.

Discovering new drugs across the District: In FY18, FCU analyzed over 100 exhibits for stakeholders including OCME, the DC Department of Corrections (DOC) and MPD. During the summer's spike in K2 overdoses, FCU demonstrated their ability for swift and accurate testing by recognizing that a new K2 was on the streets of DC. FCU has discovered two new synthetic cannabinoids and four synthetic opioids in FY18.

Improved detection of West Nile Virus (WNV) in the District: Our PHL, in partnership with DC Health, made several significant improvements to the detection process for WNV and Zika in the District. One change involved altering the traps used to collect mosquitos to ensure scientists were targeting the correct species and collecting larger quantities for testing. The other was adding collection sites on national parks including the National Mall. In addition, PHL brought online two new singleplex assays for WNV and Zika, exchanged the enzyme used to amplify nucleic acid targets to a more sensitive enzyme and introduced a new extraction method. These collective efforts improved detection of WNV by 10 percent in FY18.

Helping save DC residents' lives through rabies testing: In FY18, PHL received 243 animal brain specimens for rabies testing and 47 percent of these animals had human exposure (bites or contact with animal saliva including licks). Rabies continues to be endemic in raccoons, and increased surveillance is vital to preventing rabies transmission at the dog-wildlife interface and to protecting District residents and visitors when exposed to a wildlife rabies reservoir in the area.

PHL's Rabies Testing and Rapid Results Helped Save the Lives of Three People and Two Pets

On October 14, 2018, a raccoon attacked humans and pets in a Chevy Chase neighborhood and was captured by the Animal Control Officers in the District to test for rabies due to aggressive behavior. The raccoon was humanely euthanized and submitted to PHL on October 15, 2018 at 9:27 am for STAT rabies testing. A positive rabies result was reported at 3:19 pm to DC Health. All three exposed humans received post-exposure rabies prophylaxis and the two pets were given rabies booster vaccination and placed under confinement. Testing and rapid results were critical in helping to save the lives of these residents and their pets.

TRAINING AND QUALITY

The Training and Quality team ensures that the agency maintains the highest standards with respect to technology and emerging methodologies, and regularly conducts trainings to equip scientists with the latest advancements in forensic science.

In FY18, the Training team created and conducted two training programs designed to build or expand competency among internal and external stakeholders. In partnership with MPD, our Training team created an intensive three- to four-day MPD Academy Crime Scene Training Program. This training program equipped approximately 109 reserve officers and 85 recruit officers with evidence handling skills and procedures, as well as pass/fail competencies in a range of topics including crime scene basics, crime scene diagramming and photography, report writing and latent fingerprint powder processes.

Also in FY18, the Training team developed a 10-course professional development program for emerging leaders within DFS. The program was designed to supplement and enhance existing training curricula provided by the DC Department of Human Resources (DCHR) for non-managers who are interested in getting into management, and for new managers who need additional management skills. This emerging program will be fully implemented in FY19.

In addition to offering comprehensive trainings, the Quality team is responsible for all quality assurance measures that maintain our validity and our ability to conduct self-sustaining science. To that end, we are responsible for the coordination of audits, certifications and accreditations. These processes are designed to safeguard the public's confidence in our test results through imparting robust quality systems that improve responsibility, impartiality, traceability, reproducibility, transparency and the overall utilization of scientific approaches to problems.

TRAINING AND QUALITY WORKLOAD MEASURES

Scientists completed a total of 3,400 hours of training in FY18. Below is a breakdown of training hours by employees over the past three years:

WORKLOAD MEASURES

TRAINING AND QUALITY MEASURES	FY16	FY17	FY18
completed by employees	N/A	2,200	3,400

TYPES OF TRAINING

- **Multiple Divisions**
  - OCME Field Disaster Morgue Training
  - ANSI National Accreditation Board (ANAB Assessor Course)
- **Crime Scene Sciences Division**
  - Basic Bloodstain Pattern Recognition Course
  - Difficult Injury Photography

- 3D Shoe Impression Photography and Casting
- Courtroom Testimony Techniques

- **Forensic Science Laboratory (Forensic Biology Unit)**
  - From Training to Trial…Probabilistic Genotyping
  - Annual CODIS Conference
- **Forensic Science Laboratory (Firearm Examination Unit)**
  - Evofinder Automated Ballistics Identification User Training
  - Forensic Analysis of Shooting Incidents
- **Forensic Science Laboratory (Digital Evidence Unit)**
  - Advanced Cell Phone Data Recovery
  - EnCase v7 OnDemand Computer Forensics II
- **Forensic Science Laboratory (Latent Print Examination Unit)**
  - Advanced Latent Analysis
- **Public Health Laboratory**
  - International Conference on Emerging Infectious Diseases
  - Agents of Bioterrorism: Laboratory Response Network Rapid Methods Training
  - Laboratory Methods for Detecting Rabies Virus

TRAINING AND QUALITY ACCOMPLISHMENTS

Preparing our laboratories for successful and clean audits: In FY18, the Quality team prepared two divisions (and their various units) for several independent audits. FSL is accredited under ISO/IEC 17025 international accreditation standards by ANAB, while PHL is certified under both the Clinical Laboratory Improvement Amendments (CLIA) by Centers for Medicare and Medicaid Services (CMS) and by the CDC Division of Select Agents and Toxins (DSAT).

Each of the following audits, accreditations or certifications were conducted in FY18.

- **FSL – ANAB audit**
  - FEU, LFU and FBU underwent the annual inspection for accreditation in accordance with ISO/IEC 17025, however, the unit has a unique requirement for adherence to a second set of standards through the FBI's Quality Assurance Standards for DNA Testing Laboratories. FBU successfully passed its audit and, for three years consecutively, has yielded no findings of non-conformance with either set of standards. DEU underwent an on-site inspection by ANAB and received its first accreditation.
- **PHL – Annual CLIA inspection and recertification**
  - This year, PHL underwent and passed an annual CLIA inspection. In addition to the annual inspection and recertification, PHL passed an unannounced verification inspection by CDC DSAT, the result of which was continued acceptance of the laboratory's practice and good standing.
  - Our newly opened FCU underwent two ANAB audits for international accreditation and was awarded certifications in "Qualitative Unknown Controlled Substance" and "Quantitative Measurement Controlled Substances (heroin only)," both were necessary for DFS' incremental takeover of testing responsibilities from DEA.

Preparing scientists for the International Association for Identification (IAI) certification: In FY18, the Training team hosted two prep courses for 20 CSS members who, upon completion of the course, took independent examinations to receive their IAI certification.

OUTREACH

> Community outreach is critical to DFS' mission. It is the vehicle by which we engage with and educate District residents about our work, continue to build trust in DFS' services within our neighborhoods and support a robust Science, Technology, Engineering and Mathematics (S.T.E.M.) career pipeline for District residents and those that choose to work in our city.

In FY18, we formalized our outreach approach, creating four categories of outreach highlighted below. Our focus for the year was on offering building tours, conducting educational outreach to students in kindergarten through the 12th grade (K-12), providing mentorship and education to those attending local universities and colleges and creating partnerships that foster support for self-sustaining science and safer streets.

PEOPLE AND CULTURE

The scientists, laboratory technicians, senior leaders, administrative staff and interns that do the important work of this agency are our "People." It is our job as an agency to ensure they receive training, education and the support needed to continue to deliver on our commitment of self-sufficient science and safer streets. Equally as important is the "Culture" that we create for our People. We want to build camaraderie and a support system that creates an enabling environment for our work. To that end, FY18 brought with it several People and Culture initiatives including:

Inaugural DFS awards ceremony:
This ceremony was designed to celebrate our fifth anniversary and acknowledge outstanding contributions from the DFS team. The event was organized by the all-volunteer DFS Awards Committee. Employees were nominated by their peers and recognized across several categories including: Employee of the Year, Supervisor of the Year, Years of Service Award, Gauntlet Award for Teams, and the Phoenix Award—a one-time recognition of DFS employees and agencies and individuals outside DFS for their leadership and creative solutions.

Purple Thursday: In FY18, we held an employee-wide initiative to wear purple in honor of Domestic Violence Month.

Celebrate our veterans: On Veteran's Day, DFS saluted veterans for their service to our country and for their contributions to forensic science.

Holiday initiatives: In honor of the holiday season, DFS hosted an internal toy drive to collect gifts for District youth between 5 and 10 years old. Our staff also assisted with two holiday parties with MPD's 1st and 6th Districts.

2018 DFS Family Day: In FY18, DFS opened its doors to our family and friends. Family Day promoted another opportunity for individuals external to the organization to see, touch and experience some of the critical forensic science work underway in the District to improve the safety of our residents.

Health and wellness initiatives: In FY18, DFS opened two rooms (lactation room and a women's locker room) devoted to promoting relaxation during stressful times, support for new mothers, and a space devoted to the overall health and wellness of our employees. Also, in support of health and wellness, our staff participated in the National Police Week 5K, a five-kilometer run/walk in remembrance of the 23,000+ fallen officers who gave their lives in the line of duty.

DFS EDUCATES & MENTORS

DFS engages in a range of programs designed to build awareness of the ongoing and vitally important work of our agency and to promote careers in forensic science and other S.T.E.M. fields. In FY18, we organized, participated in or led the following initiatives:

K-12 educational outreach: DFS scientists and staff participated in several outreach programs designed to help elementary, middle and high school students understand some of the work we perform within the agency. We attended Patterson and Simon Elementary Schools and gave presentations and fingerprinting demonstrations to students. We also conducted outreach and presentations at Excel Academy, Coolidge High School Public Health Academy and Anacostia High School Public Safety Academy.

Outreach to local universities and colleges: DFS staff gave student and faculty presentations to a several universities including Georgetown, George Washington, American and George Mason.

SPECIAL PROJECTS & INITIATIVES

> *Each year DFS supports several special projects and initiatives that are cross-cutting in nature and that involve stakeholders from across the District.*

In FY18, we organized, participated in or led the following initiatives:

National Medical Laboratory Professionals Week: We conducted a fun-filled week of educational activities to celebrate medical laboratory professionals within the building. In honor of this week, we planned several themed days to celebrate our laboratory professionals (e.g., "Wear Blue Day," "Culture Day" and "Crazy Sock Day"). We also had a special themed "Superhero Day" which coordinated with our FY17 superhero themed annual report, "Super Science, Safer Streets."

National Forensic Science Week: This local event was held September 12-21, 2018 and included a myriad of activities across the city. DFS conducted community outreach during this event and hosted an in-house kick-off that brought together nearly 100 individuals across the city to learn about the power of forensic science and how it is used to keep our streets safe. A key feature of our event was the agency's first ever Facebook Live event that reached nearly 1,000 residents and yielded multiple shares and 475 views.

INTERN SPOTLIGHT

Internships are an integral component and concrete outcome of DFS' outreach efforts. From the fall of 2017 through 2018, we attracted 38 interns through myriad feeder programs across the country including U.S. Army, DC Department of Disability Services, National Institutes of Health, McKinley Technology High School and multiple colleges and universities.

We also support internship initiatives prioritized by the Mayor's office, including the District Leadership and Marion S. Barry Summer Youth Employment Programs, which promote employment opportunities that build pathways to the middle class.

Our internships provide students with practical experience and the type of exposure needed to strongly consider careers in forensic science and public health. From mentorship and shadowing opportunities to conducting research and data collection, our internship projects run the gamut and are based on students' grade level, background, experience and interests.

Our interns typically meet a standard set of criteria for program entry including:

- Application processing
- Interviews
- Background checks
- Internship program types (by grade level)
  - **S.T.E.M. Program High School Internship:** for junior or senior high school students
  - **Programmatic Internship:** for junior or senior undergraduate students
  - **Research Internship:** for masters or doctoral-level students

FUN FACTS ABOUT DFS INTERNS

ACEY loves to read, is a member of Alpha Phi Alpha Fraternity Inc., and is a young entrepreneur running a fitness program.

ADAM likes to rock climb, is into motorcycles, and has been to four continents.

FRANCIS enjoys fishing, loves doing small projects at home, and is a professional "bucket list scratcher".

KA'ENA runs track, loves the beach, and LOVES to make people smile.

KAJAL is a major soccer fan, plays the viola, and was born with naturally straight hair that has converted to natural curls.

LAUREN played and now coaches volleyball, started a student organization in college, and has traveled to China, Guatemala and Mexico with plans to travel more!

The best part is that our pool of interns is just as diverse, interesting and dynamic as the scientists, technicians and administrative staff here at DFS.

For our FY18 annual report, we selected a few interns to reflect on their experiences and accomplishments at DFS, talk about what interests them in forensic science and provide a few pointers for other students who may be interested in pursuing internships with DFS or in the broader fields of forensic science and public health. Check out a few fun facts about our spotlighted interns and a full intern list at the end of this section.

OPERATIONS

In FY18, the Operations team had two interns providing support for a range of projects including the human resources digitization project, employee onboarding survey and an overtime reconciliation report.

SPOTLIGHT ON: KA'ENA FARMER

What was your major accomplishment during your internship? My major accomplishment was creating an employee onboarding survey designed to facilitate a successful onboarding process and receive feedback on the process along the way. I also assisted in the creation of a virtual database of employee personal files, which will allow for more efficient and easily accessible records.

What interests you about forensic science? What I find most interesting about forensic science is that it's a field grounded in helping people. Whether scientists are working to identify who committed a crime or exploring a virus that has the potential to harm others, it all comes back to helping others and ensuring their safety.

What piece of advice would you give to other interns potentially interested in internships at DFS or possible careers in forensic science or public health? Strongly consider an internship at DFS and, if selected, take full advantage of everything they have to offer. DFS' internship program is unlike any other. They provide hands-on experience and the opportunity to work on so many different projects. You also have a lot of fun in the process while taking part in community outreach events, ride-alongs, mentorship opportunities and more.

CRIME SCENE SCIENCE DIVISION (CSS)

CSS had two interns during the fall of 2017. Both interns earned Master of Science degrees in Crime Scene Investigation and are poised for pursuing careers in forensic science. Upon completion of the internship program at DFS, Adam Sabolich, an intern recruited at the DCHR Veterans' Job Fair, has joined DFS full-time.

SPOTLIGHT ON: ADAM SABOLICH

What did you find most exciting about your internship? I spent most of my internship assisting in the procurement of forensic supplies, however, the most exciting aspect was networking with CSS personnel and learning about day-to-day operations. My experience helped me translate what I had only experienced in a classroom into a real-world setting.

What interests you about forensic science? I transitioned into this field from another career. What keeps me interested in forensics is how you experience something new every day, and this keeps things interesting and keeps you wanting to learn more.

What piece of advice would you give to other interns potentially interested in internships at DFS or possible careers in forensic science or public health? I would say network as much as possible. I networked through internships and by attending conferences. Networking helped me connect with the community and eventually helped me land a job at DFS.

FORENSIC SCIENCE LABORATORY (FSL)

In FY18, FSL employed 15 interns who provided either year-round support or a summer-long commitment to the division and its various units.

Our interns were divided within FSL as follows:

- 2 District Leadership Program interns
- 1 Marion Barry Summer Youth Employment Program intern
- 3 FIU interns
- 1 DEU intern
- 5 FBU interns
- 2 FEU interns

SPOTLIGHT ON: ACEY CALHOUN

What was your major accomplishment during your internship? My major accomplishment was helping design the t-shirts, pamphlet and flyer for National Forensic Science Week.

How was your overall experience working for DFS? Simply amazing! I loved my co-workers, as well as the other interns. The most exciting thing about my internship was the fact that there was never a dull moment. While I was technically assigned to the FIU, I had the opportunity to shadow and work with every unit within the division, and I got to work on several projects in FEU and LFU. I also loved taking part in our creative and highly-informative end-of-summer presentations.

Has this experience shaped your decision to pursue a career in forensic science? This experience has enhanced my desire to enter the legal field as an attorney.

SPOTLIGHT ON: ALEXANDRIA "LAUREN" MAUNEY

What was your major accomplishment during your internship? My major accomplish was assisting with the successful execution of DFS Family Day and National Forensic Science Week 2018.

What interests you about forensic science? Forensic science interests me due to the highly collaborative nature of the field. My general interest in science evolved into a love of forensics once I gained insight into the work and the impact forensics has on so many lives. I quickly realized this field was something I could see myself doing and enjoying as a career.

What piece of advice would you give to other interns potentially interested in internships at DFS or possible careers in forensic science or public health? My biggest piece of advice to future interns would be to take advantage of every opportunity available that is offered at DFS. DFS offers hands-on experiences for interns, as well as opportunities to work with and shadow other units.

PUBLIC HEALTH LABORATORY (PHL)

In FY18, PHL had a range of interns providing support across our six units. Of note were the number of university-level interns we were able to attract, and the complexity of the projects assigned (e.g., optimizing parameters for detection of rat poison in the K-12 studies, conducting cell culture isolation and identification of potential arboviruses circulating in the District's mosquito population and completing extensive literature reviews for key projects and research papers). Below is a breakdown of the number of students by grade level:

- 2 S.T.E.M. high school interns
- 9 undergraduate interns
- 3 graduate interns
- 2 post-doctoral interns

SPOTLIGHT ON: KAJAL PATEL

What was your major accomplishment during your internship? My key project was the isolation and identification of arboviruses using cell culture. Using cell culture, I found a mosquito pool of *Psorophora columbiae* that was found to be positive for WNV, which PCR failed to detect. This was the first time this genera of mosquito has been found to be positive for WNV in the District.

What did you find most exciting about your internship? I found it exciting to be able to talk about mosquito surveillance during DFS Family Day, and to hear everyone else explain their roles at the lab. It was a lot of fun to talk to visitors about what happens at the lab and to see their excitement about it as well.

What piece of advice would you give to other interns potentially interested in internships at DFS or possible careers in forensic science or public health? I would tell other interns to take the opportunity to talk to other laboratory techs about their work, ask them questions and ask for opportunities to observe them while they work. Even if lab techs are working on projects unrelated to what you are doing, this can expose you to different assays and the different types of testing being done at the lab. The entire experience can help expand your knowledge and broaden your interests.

TRAINING AND QUALITY

The Training and Quality team is responsible for the coordination of DFS' overall internship program. During the summer and fall of 2018, Francis Beirut Poblete managed all the other interns, working to get them placed and acclimated into the various divisions and units. In addition to supporting the management of the internship program, Francis also assisted with the Quality team's blood dilution project and with CSS' case file project.

SPOTLIGHT ON: FRANCIS BEIRUT POBLETE

What did you find most exciting about your internship? Throughout my internship, I was able to witness how the work of different divisions and units within DFS influence crime prevention in the District. I was also able to immerse myself in the field I always dreamed of working in. By conversing with different personnel in each division, I felt a stronger sense of my ability to step into their shoes and perform similar tasks.

What interests you about forensic science? I believe in the phrase, "follow where the money goes." This expression suggests that one should pursue passions and careers that are, or can be, lucrative. After working with DFS and having an opportunity to learn and hear from the staff, I realize that forensic scientists and technicians will always be in demand because crime doesn't stop.

Has this experience shaped your decision to pursue a career in forensic science? Yes. This experience opened my eyes to many options that I never thought existed. Before, I was only interested in pursuing a laboratory position, but now, I am more interested in trying my hand at becoming a crime scene tech.

FY18 DFS INTERNS

NAME	DEGREE	UNIVERSITY	PROJECT
Stephanie Wicks	MFS in Crime Scene Investigation	George Washington University	CSSU – stocking supplies and inventory
Adam Sabolich	MFS in Crime Scene Investigation	Indiana University	CSSU – maintain logistics/stocking
Ajani Bennett	Finance	Illinois State University	FIU – Sex Kit Studies report, the Summer Crime Initiative
Chela Hart	BS in Criminal Justice	American Public University	FEU – photographic inventory and update files of SAF
Kayla Lapworth	MFS in Forensic Chemistry	George Washington University	FBU – lab cleaning, stocking, admin work
Brandi Iorio	MFS in Molecular Biology	George Washington University	FBU – lab cleaning, stocking, admin work
Julia Harrison	Business Administration	University of Delaware	Operations – admin tasks
Lydia Wood	BS in Criminal Justice	North Carolina A&T	FEU – SAF project
Jared Ables	BS in Computer Science	Towson University	DEU – software hardware validations
Riya Thekdi	Forensic Molecular Biology	George Washington University	FBU – lab cleaning, stocking, admin work
Kathryn Carte	Forensic Molecular Biology	George Washington University	FBU – lab cleaning, stocking, admin work
Carin Hadden	MS Pharmacy Concentration in Forensic Science	University of Florida	PHL – validations and general laboratory operations
Samira Taylor	BS in Forensic Science	Hilbert College	FIU – admin and entering requests into LIMS
Nia Deot	MS in Public Health Microbiology and Emerging Infectious Disease	George Washington University	MDU – Comparison of 4 molecular Zika tests

FY18 DFS INTERNS (continued)

NAME	DEGREE	UNIVERSITY	PROJECT
Aissatou Sow (DLP)	Criminal Justice	University of District of Columbia	FSL – general admin
Lesley Krien	Biological Sciences	University of Maryland	PHL – scribe for strategic planning, organizing files/folders, bench cards for distribution to hospital laboratories
Jessica Lowry	MS in Public Health Microbiology and EID	George Washington University	PHL – Zika IgM Assay Comparison study
Lauren Carter	High School	McKinley Tech	PHL – various testing platforms to detect pathogens/viruses: RT-PCR, Maldi-TOF, and PFGE
Alanna Randolph	High School	McKinley Tech	PHL – various testing platforms to detect pathogens/viruses: RT-PCR, Maldi-TOF, and PFGE
Kalkidan Tamiru	BS in Biology	Virginia Commonwealth	FIU – Summer Crime Initiative, tracking cases for testing other administrative duties
Dominic Buckner	BS in Bioinformatics Mathematics & Chemistry	Bowie State	BACU – nanoparticle characterization, bio-monitoring program
Amanda Anna	MFS in Forensic Molecular Biology	George Washington University	FBU – laboratory up-keep validation projects dilution series
Isabell Harvin	BS in Forensic Science	John Jay College of Criminal Justice/CUNY	FCU – syringe project/ method development for LC-MS/MS screening of syringe washes for trace synthetic drugs

FY18 DFS INTERNS (continued)

NAME	DEGREE	UNIVERSITY	PROJECT
Reba Chamblee	Forensic Chemistry	University of Mississippi	FCU – instrumentalist (GC-MS Weekly Maintenance)
Abigail Meyer	MS in Forensic Science	Marshall University	FCU – training program development/ validation support
Sarah Parsons	MA in Business and Organizational Security Management	George Mason	FIU – Summer Crime Initiative and Sex Kits Study
Deanna Kaye-Daley	MFS concentration in Forensic Chemistry	George Washington University	FCU – FTIR Adulterants Project (lead)
Marisol Rozo	BS in Forensic Science	Penn State University	FCU – instrumentalist (FTIR weekly maintenance) and support FTIR
Kajal Patel	Public Health Microbiology and EID	George Washington University	ICU – arboviruses from mosquitos using cell culture
Ka'ena Farmer	BS in Business Administration	Hampton University	Operations – improve onboarding
MiKayla Wright	Biology minor in Criminal Justice	North Carolina Agriculture & Technical State University	PHL – check cytopathic effect for 10 days post inoculation
Karisma Nagarkatti	MS in Public Health Microbiology and EID	George Washington University	MCB – Evaluation of molecular detection of MCR-1 gene
William Witt (SYEP)	Post High School	The Maret School, Washington DC	PHL – admin support
Francis Beirut Poblete	Forensic Science	University of Baltimore	Training and Quality – intern coordination of activities/research blood dilution

FY18 DFS INTERNS (continued)

NAME	DEGREE	UNIVERSITY	PROJECT
Nicole O'Dell	Bachelors	Brandeis University	PHL – admin support
Acey Calhoun (DLP)	Criminal Justice	Virginia State	FSL – National Forensic Science Week
Lauren Mauney (SYEP)	Bachelors	University of Nebraska at Kearny	FSL – National Forensic Science Week
Dr. Kindra Stokes	Doctorial Immunology	Penn State University	MDU – Verification of MERS-CoV molecular test for clinical testing

DFS FUTURE PROJECTS

> FY18 was an incredible year, one that highlighted our self-sustaining science and promoted safer streets across the District. From increasing operational efficiency, processing thousands of crime scenes and related evidence, completing 100 percent of sexual assault kits in house, discovering new synthetic opioids across the District and receiving the necessary certifications and accreditations to further validate our independence, we are poised to achieve even more in FY19.

Below is a sampling of the planned initiatives for FY19.

OPERATIONS

- Implement the Consolidated Laboratory Equipment and Instrument Maintenance Contract.
- Identify a new LIMS.
- Work with DGS, PSD and HSEMA to improve critical infrastructure security for the Consolidated Forensic Laboratory.

CRIME SCENE SCIENCES DIVISION (CSS)

- Research and design a digitization process for the preservation, retention and retrieval of original MPD crime scene files stored at DFS.
- Implement a Leica scanning outreach/ training program and solicit feedback.
- Launch a pilot program utilizing tablet computers at crime scenes to capture data and electronically transfer to LIMS.

FORENSIC SCIENCE LABORATORY (FSL)

- Support a credit-based minor degree program in forensic pattern recognition through the University of the District of Columbia.

- **Forensic Evidence Unit (FEU)**
  - Validate the EvoFinder for casework.
- **Forensic Biology Unit (FBU)**
  - Implementing NGS platform for DNA profiling.
- **Forensic Intelligence Unit (FIU)**
  - Create and release Forensic Intelligence reports of interest to the public safety community.
- **Digital Evidence Unit (DEU)**
  - Implement a crash data recovery capability.

PUBLIC HEALTH LABORATORY (PHL)

- **Forensic Chemistry Unit (FCU)**
  - Establish an opioid surveillance laboratory in support of the DC Opioid Strategy, “Live. Long. DC.”
- **Immunology Virology Unit (IVU)**
  - Implement a new molecular test for more accurate rabies detection. PHL will be a pilot site of this new test that was developed by CDC.
- **Microbiology Unit (MBU)**
  - Re-establish Sexually Transmitted Infection (STI) testing in PHL.
- **Molecular Diagnostic Unit (MDU)**
  - Implement whole genome sequencing activities.
  - Implement rapid diagnostic testing capabilities for vaccine preventable diseases including mumps and measles.

TRAINING AND QUALITY

- Convert all the FSL and FCU’s quality documents from ISO 17025: 2005 to ISO 17025: 2017.
- Undergo ISO/IEC 17025 accreditation of the Evidence Processing section within the LFU.
- Train emerging leaders on the 10-course curriculum created in FY18.

I AM DFS
The DC Department of Forensic Sciences

Government of the District of Columbia
Department of Forensic Sciences

401 E STREET, SW WASHINGTON, DC 20024

Self-Sustaining Science, Safer Streets

2018 ANNUAL REPORT

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DISTRICT OF COLUMBIA DFS DEPARTMENT OF FORENSIC SCIENCES

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MURIEL BOWSER, MAYOR