MEMORANDUM

March 28, 2019

TO: Public Safety Committee

FROM: Susan J. Farag, Legislative Analyst

SUBJECT: **Briefing: Police Department Crime Lab and Forensics**

PURPOSE: Briefing on the Police Department's Crime Lab and Forensics

Today the Public Safety Committee will be briefed on the MCPD's Crime Lab. The Police PowerPoint presentation is attached at ©1-14 and Police responses to questions is attached at ©15-26.

Those who are expected to attend include:
Assistant Chief Marcus Jones, Investigative Services Bureau, MCPD
Captain Michael Ward, Director of the Criminal Investigations Division
Francis Chiafari, Crime Lab Director

OVERVIEW

The Montgomery County Police Department Crime Lab is one of seven crime labs in the State. Others include the State Police, Baltimore City, Baltimore County, Anne Arundel County, Prince Georges County, and Howard County, although the Howard County lab does not operate biology or chemistry units.   The lab employs 45 staff (several positions are currently vacant), both sworn and civilian, and is overseen by a civilian Crime Lab Director. The Crime Lab falls under the Criminal Investigations Division in the Investigative Services Bureau. The lab is responsible for providing forensic services to MCPD as well as other user agencies.

The Crime Lab is divided into six primary units, including:

- Crime Scene Unit;
- Latent Print Unit;
- Firearms Examination Unit;
- Forensic Biology Unit;
- Forensic Chemistry Unit; and
- Electronic Crimes Unit.

CRIME LAB

The old lab on Research Boulevard operated in extremely restrictive areas that were not designed to house lab units. Different lab units were separated from each other. There was no room for expansion, and work conditions were not optimal. When the new Public Safety Headquarters opened in 2014, it included a much larger state-of-the-art crime lab. For the sake of comparison, the old Biology Unit on Research Blvd. had approximately 750 square feet. The new lab provides 7,100 square feet for this function alone and maintains separate office space outside of the controlled laboratory space.

The new location also allowed for the creation of the Electronic Crimes Unit, which currently operates a state-of-the-art digital laboratory including work stations, equipment storage, Faraday Boxes (necessary to house certain evidentiary electronic devices so that they cannot access wi-fi or cell phone networks).

STAFFING AND ACCREDITATION

The unique nature of forensic science requires both highly specialized scientists and sworn positions. Scientists require specific college degrees as well as additional specialized training. Some positions require additional licensure. Police officers also receive specialized training. In addition, the lab itself must maintain certain accreditations and undergo regular audits (see list on ©24).

The Police Department notes that these education and training requirements create a very small pool of specialists from which to recruit and hire. There is a high demand in the field to recruit experts away from other labs, and this creates challenges for hiring and retaining excellent staff. Occasionally, the Lab must offer in-house training to ensure new hires have the required expertise. These training periods can strain Lab resources, resulting in case backlogs in all units.

The mix of both sworn and civilian staff makes supervision complex. The Crime Scene Unit, the Latent Print Unit, and the Firearms Examination Unit are supervised by a sworn police sergeant. The remaining units fall under the direct supervision of the civilian director. The flat chain of command is different from other crime labs in the state, and two supervisory positions were created in 2018 to oversee the Biology and Chemistry Units. MCPD is currently awaiting exemptions to fill both positions. MCPD notes that ideally, the Lab would also have a mid-level supervisor over the two pattern evidence units (Latent Print Unit and Firearms Examination Unit), leaving the sworn sergeant to supervise only the Crime Scene Unit.

USE OF OUTSIDE LABS

Not all work is done in-house. The Forensic Biology Unit is the only unit that uses an outside lab (Bode Technology) for evidence analysis, typically for rapes and property crimes. Outsourcing is occasionally necessary due to the "Hicks Rule" that requires evidence must be ready for courts within six months of arrest. The Forensic Biology Unit does not have enough

staff to keep up with the current case backlog of 212, or add additional technologies such as paternity statistics, Y-STR testing and SNP testing.

Public DNA Databases: Several recent closures of homicide and rape cases have been solved using DNA information obtained from public DNA databases. The Crime Lab works with Parabon NanoLabs in Virginia, which takes a portion of the DNA extract and performs a DNA phenotyping service. This service generates a DNA profile including information such as face morphology, eye color, pigmentation, and other traits. The DNA information can also be matched to DNA information on public DNA databases such as GEDmatch.com. The database is generally used to help people find relatives for ancestry purposes. Participation in completely voluntary and there is a disclaimer that the user agrees that information may be accessed by law enforcement to identify perpetrators of violent crimes, or to identify the remains of a deceased individual.
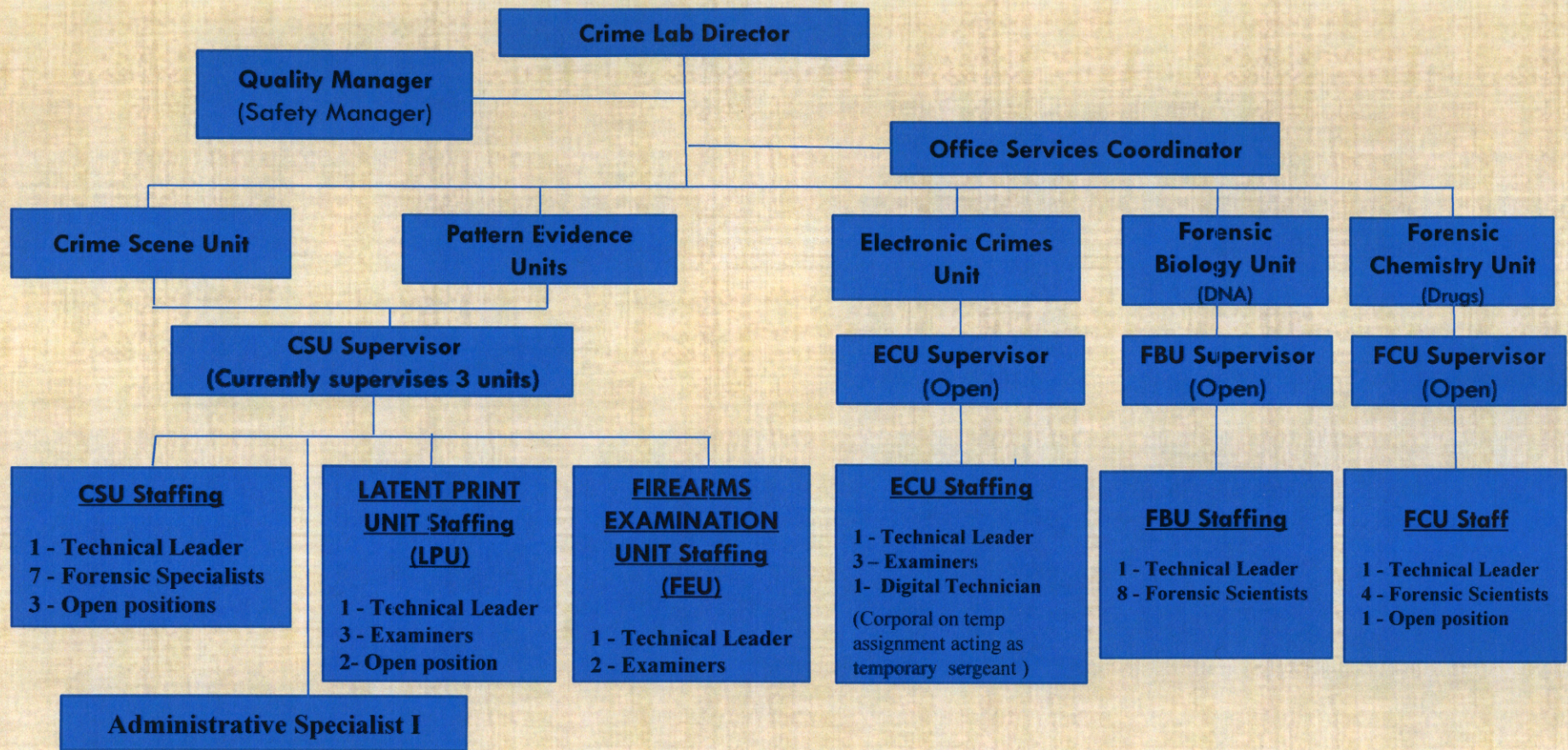
DISCUSSION ISSUES

1. What is the current status of the exemption request on the two positions the Lab is trying to fill? Does the Department expect approval for these positions during FY19?
2. The Lab has also received one new position in the Forensic Biology Unit. What type of position, and what is the hiring status for this position?
3. How will the new position in the Forensic Biology Unit impact backlogs? Would it be better to process all biology evidence in-house, or will contracting with an outside lab remain the most cost-effective way to process evidence in a timely manner?
4. MCPD also advises that the Electronic Crimes Unit needs dedicated and redundant backup storage capacity. The evidence stores for this unit is very sensitive in nature and vulnerable to hacking. The Department advises that the current storage will reach its maximum soon. Council staff notes that the Executive has a new CIP project included this year, PS342001, Master Lease: Digital Evidence Storage, which provides $750,000 in FY20 (see ©27). Does MCPD know if this project will provide funding for Crime Lab evidence storage needs? If not, the GO Committee may consider this item on April 22, and if appropriate, additional funds could be added to address Crime Lab needs.

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Montgomery County
Police Crime Lab

Crime Laboratory Section

Crime Lab Director

Quality Manager
(Safety Manager)

Office Services Coordinator

Crime Scene Unit

Pattern Evidence Units

Electronic Crimes Unit

Forensic Biology Unit
(DNA)

Forensic Chemistry Unit
(Drugs)

CSU Supervisor
(Currently supervises 3 units)

ECU Supervisor
(Open)

FBU Supervisor
(Open)

FCU Supervisor
(Open)

CSU Staffing

1 - Technical Leader
7 - Forensic Specialists
3 - Open positions

LATENT PRINT UNIT Staffing (LPU)

1 - Technical Leader
3 - Examiners
2 - Open position

FIREARMS EXAMINATION UNIT Staffing (FEU)

1 - Technical Leader
2 - Examiners

ECU Staffing

1 - Technical Leader
3 – Examiners
1 - Digital Technician

(Corporal on temp assignment acting as temporary sergeant)

FBU Staffing

1 - Technical Leader
8 - Forensic Scientists

FCU Staff

1 - Technical Leader
4 - Forensic Scientists
1 - Open position

Administrative Specialist I

Forensic Biology Unit

-*Locates and detects possible body fluids on items of evidence and performs DNA analysis on those samples to determine if an individual can be included or excluded as a possible contributor to the DNA profile*

- *Example-*
  - *The unit will examine an item for blood, semen, sample items where saliva may have been left behind (mouth area of bottles) or areas where an individual may have handled the item such as a handle of tools used in a burglary.*

The Biology Unit participates with the FBI's Combined DNA Index System (CODIS) – Compares DNA samples across the nation to connect them with suspects and other crimes.

Forensic Biology Unit

Forensic Chemistry Unit

- **Performs tests on Controlled Dangerous Substances (CDS-Drugs)**

- **First regulated portion of the Laboratory**

- **First portion of the laboratory with required certifications for the analysts**

Forensic Chemistry Unit

Electronic Crimes Unit

- Examines computers, cell phones, and other electronic devices seized in connection with crimes for evidence or intelligence information hidden in the system's data; investigates computer fraud and other criminal activity involving computer technology.

- Responsible for reviewing and retrieving video images; developing digital photographic images for court and investigative purposes; and providing photographic support for department functions.

- While not a state requirement, Montgomery County Police require all investigators to be certified and maintain certifications.

Electronic Crimes Unit

<u>Latent Print Unit</u>

- Conducts latent fingerprint comparisons and utilizes regional and statewide-automated systems to compare prints of arrested subjects, suspects, witnesses, and deceased individuals against latent fingerprint evidence obtained at crime scenes and examine the results.

The Latent Print Unit participates with the FBI's Integrated Automated Fingerprint Identification System (IAFIS) - Compares fingerprint samples across the nation to connect them with suspects and other crimes.

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Latent Print Unit

Firearms Examination Unit

- Conducts firearm/toolmark examinations and enters all ballistic data obtained from firearm and cartridge cases into the National Integrated Ballistic Information Network (NIBIN) as a means to link violent crimes committed with firearms.

Firearms Examination Unit

Crime Scene Unit

- Processes serious crime scenes to include photography, chemical examinations, latent fingerprinting, tire/footprint/shoe/tool impressions, bloodstain pattern documentation and evidence collection.

- Processes evidence in the laboratory for latent prints and biological evidence.

- Evaluates and interprets bloodstain evidence to provide information on the event or sequence of events that resulted in the deposition of the bloodstains or bloodstain patterns.

- Conducts footwear and tire track comparisons.

Crime Scene Unit

1) Description of Crime each Unit:

The Montgomery County Police Crime Laboratory (MCPCL) is one of seven police crime laboratories in the state of Maryland. The other crime laboratories include the Maryland State Police, Baltimore City, Baltimore County, Anne Arundel County, Prince Georges County, and Howard County (the Howard County Police Crime Laboratory does not operate biology or chemistry units). The MCPCL is an accredited laboratory which employs scientists who process and analyze items of evidence in support of the Montgomery County Police Department's mission. The mission statement of the MCPCL reads as follows;

The Montgomery County Police Crime Laboratory will provide timely quality forensic service to the investigators of MCPD and other user agencies. Forensic examinations conducted in the Forensic Biology, Forensic Chemistry, Crime Scene (including Bloodstain Pattern Analysis), Electronic Crimes, Firearms/Toolmarks, and Latent Print Units, and with respect to Footwear/Tire Track examinations, will be conducted with integrity, ethics, and professionalism. Following the motto "Evidence Speaks to Fact," the Crime Lab will maximize the value of forensic evidence by putting the case first.

The MCPCL falls under the Criminal Investigations Division (CID), and is led by a civilian Director. Under the Director is a Quality Manager, who does not hold any supervisory or leadership role, but manages the MCPCL's vast accrediting and quality control mandates   The MCPCL is then broken down into the following Units:

Crime Scene Unit (CSU): The CSU is responsible for responding to major crimes scenes, documenting the scenes, and collecting evidence. The CSU covers non-work hours on call. The CSU also processes pieces of evidence submitted by other officers for latent prints and DNA.

Latent Print Unit (LPU): - The LPU conducts latent fingerprint comparisons. The Unit accesses regional and state databases to compare prints against latent print evidence recovered from crime scenes. The primary database used by the LPU is the Regional Automated Fingerprint Analysis System (RAFIS).

Firearms Examination Unit (FEU): – The FEU conducts firearms and tool mark examinations. The primary database used by the Unit is the National Integrated Ballistic Information Network (NIBIN) which is owned and maintained by the Federal Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF).

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Forensic Biology Unit (FBU): The Biology Unit locates and detects possible body fluids on items of evidence and performs DNA analysis on those samples to determine if an individual can be included or excluded as a possible contributor to the DNA profile. The primary database used by the Biology Unit is the Combined DNA Index System (CODIS), which is owned and maintained by the FBI.

Forensic Chemistry Unit (FCU) – the Chemistry Unit performs tests on Controlled Dangerous Substances (CDS).

Electronic Crimes Unit (ECU) – The ECU is responsible for conducting analysis and data recovery from electronic devices. Most of the work performed by the ECU involves the execution of search and seizure warrants upon electronic devices. The ECU also includes one Digital Technician who is responsible for the analysis/recovery of digital images.

2) **Staff (civilian, sworn, required training, retention issues):**

Due to the manner in which the MCPCL has evolved, the structure of the entity is of a hybrid nature, and includes both sworn and civilian personnel. CSU, LPU, and FEU are supervised by a sworn police sergeant. The remaining units currently fall under the direct supervision of the Director. The flat chain of command within the MCPCL was identified as different from the other crime labs in the state. As a result, in 2018 two supervisory positions were created to oversee the Biology and Chemistry Units. CID is currently awaiting exemptions to fill both positions. Ideally, the Lab would also have a mid-level supervisor over the two pattern evidence units (LPU and FEU), which would leave the sworn sergeant supervising only the CSU unit.

Each unit within the MCPCL has a Technical Leader. Technical Leaders are responsible for assignment, tracking and evaluation of casework. The Technical Leaders do not perform any other traditional supervisory functions (employee evaluation, scheduling, discipline, etc.). The Code of Maryland Regulation (COMAR) mandates that each discipline in a forensic science laboratory designate a Technical Leader (10.51.01.03.93 *"Technical leader" is defined as an individual who is qualified by education and experience and is accountable for the technical operations of the forensic laboratory analyses in a specific discipline or sub discipline of forensic science.*)

Each of the disciplines within the MCPCL require personnel with specific education, experience, and training. The combination of these requirements results in the existence of very small community (internal and external) of specialists in each discipline.

Biology Unit: Required to have BS/BA in Biology, Chemistry, or a forensic science-related area and 12 college credits in four specific subject areas. The Technical Leader is required to have a Master's Degree. Minimum 6 months training required (DNA only). Some previous forensic DNA lab experience may substitute for training. FBI mandates requirements for DNA education and training due to use of CODIS.

Chemistry: BS/BA in Chemistry, Biology, or a forensic science-related area with a strong concentration in chemistry. No training period recommended or required by accrediting bodies or COMAR. Three to six (3-6) months of training is required by the Director. Training courses provided by DEA. All applicants must have minimum of 3 years previous forensic drug analysis lab experience as required by MD law to apply. Cannot conduct testing until possession of MD Department of Health license.

Latent Print Unit: COMAR 10.51.06.15 F requires one year of ten print/latent print experience and one year of forensic lab services prior to performing LPU examinations. This experience can be gained during a training program. MCP requires latent print examiners to have a bachelor's in forensic science or to be certified by the International Association for Identification (IAI).

Firearms Examination Unit: BS/BA in Biological or Physical Science, Criminal Justice, Criminology, or related field. Two years training required prior to analyzing evidence. Prior experience may be substituted. Training may be provided by ATF courses.

Crime Scene Unit: MCP requires a bachelor's in Criminal Justice, Criminology, or a natural science. County requires one years' experience processing crime scenes to apply. Experience may be substituted by having a MS. 6 months in house training prior to performing solo. CSU examiners require expertise in 3 disciplines to perform their jobs – crime scenes, latent print processing and biological evidence screening.

Electronic Crimes Unit: All sworn. Must complete courses specified by the director and tech leader and have their Certified Forensic Computer Examiner certification prior to conducting casework. Following completion of training, examiners complete about three months of supervised casework before solo.

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3) <u>The old lab compared to the new lab- benefits of new lab:</u>

The MCPCL began its existence in the old MCP Headquarters on Research Boulevard. As new units were formed, and units expanded, they were forced to operate in extremely restrictive areas that were not designed to house laboratory units. This also left the MCPCL fragmented with different units located in various areas. None of the units had sufficient space within which to conduct their work, and there was no room for any unit to expand. When MCP moved to the new HQ on Edison Park Drive, the top floor was designated as the laboratory space due to the roof venting necessary for most of the units. As a result, the fifth floor was re-designed for laboratory purposes to meet the needs of each unit. The new Public Safety Headquarters (PSHQ) offers much more space than the previous location. New space has controlled access to minimize contamination and maintain the integrity of the evidence and chain of custody.

The Chemistry Unit is currently operating in a state of the art space that includes approximately 3800 square feet and separate office space outside of the controlled laboratory space. The old space on Research Boulevard was about ¼ of the current size.

The Biology Unit is currently operating in a dedicated laboratory space of approximately 7100 square feet and maintains separate office space outside of the controlled laboratory space. The old location consisted of three small rooms that were approximately 250 square feet apiece. This was at a time when DNA technology and it application to law enforcement was expanding at a fast pace.

The CSU currently consists of five evidence processing labs and office space outside of the controlled laboratory space. The CSU also has a vehicle processing facility off-site on Seven Locks Road. Previously, the unit worked in extremely cramped quarters.

The FEU has also expanded its space to include a laboratory examination room, a dedicated Firearms Reference Collection room, staff cubicles, a dedicated NIBIN room, and a test fire lab. This unit had very limited space in the Research Boulevard location.

The LPU has greatly expanded space that allows for use of natural light during examinations and secure storage of known fingerprint records and evidence items. The latent print examination space in Research Boulevard was small in in the basement of the building.

The ECU is a new unit that was created after the Department moved into the new PSHQ. The ECU currently occupies a state of the art digital laboratory that includes work stations, room for equipment, and Faraday Boxes (used to contain electronic devices and preclude the device form accessing Wi-Fi internet signals).

4) **What is processed in house and what gets sent to outside labs (PERK, Physical Evidence Recovery Kit), and why?**

Biology is the only unit that uses an outside laboratory (Bode Technology) for evidence analysis, typically for rapes and property crimes. Sometimes a person's crime other than a PERK may be sent to Bode if the lab is running out of time (Hicks Rule – evidence must be ready for court within 6 months of arrest (including 10-915) – speedy trial rule). Currently the Biology Unit does not have enough staff to keep up with the current backlog of cases (212 as of 3/26/19) or add additional technologies such as paternity statistics, Y-STR testing and SNP testing. Y-STR testing is best used in rape cases because it isolates only the male DNA present which is extremely helpful in cases where high female DNA may also be mixed in (vaginal sample with a small amount of semen). Overall, the reasons for outsourcing are as follows: high backlog of cases, increase in untested rape kits dating back to 1975, and technologies that are not offered by the Unit such as paternity statistics, Y-STRs and SNP testing which is used for genealogy searching.

5) **Below are just a few cases closed by arrest in which the lab results generated the lead for detectives:**

On September 6, 2017 at approximately 2106 hours, the suspect entered the third district police station. The suspect, covered in blood, stated "that was me....that shot the man in the trailer." The suspect was transported for medical care and his clothing and vehicle were seized as evidence. A recreational vehicle (RV) was located at an address in Silver Spring. Within the RV, the victim was located with multiple gunshot wounds.

Multiple search warrants, supplemental calls and additional forensic calls for service were completed over the next four months. These included the processing of the suspect's vehicle, metal detector searches, the processing of multiple scenes, the execution of multiple search warrants, firearms examinations, and forensic biology examinations.

On February 8, 2018, a request for a bloodstain pattern analysis on certain items of clothing belonging to both the suspect and the victim was received. Multiple areas were sampled and sent to the Forensic Biology Unit. Based on the evaluation of the suspect's clothing (camouflage pants), an area of blood was identified as being from the victim.

Units Involved - Crime Scene Unit, Firearms Examination Unit, Forensic Biology Unit, Bloodstain Pattern Analysis

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On June 5, 2017 at approximately 2246 hours, police were called to an address in Montgomery Village for a suspicious situation involving a running vehicle. Two victims were located deceased in the driver and front passenger seats. Both victims were scheduled to graduate from high school the following day.

A total of sixteen (16) calls for forensic service were completed in reference to this case. These calls included the Crime Scene Unit (both on scene and laboratory processing), Firearms Examination Unit, Forensic Biology Unit and the Electronic Crimes Unit.

On June 17, 2017, three suspects were arrested and charged with first degree murder after being linked to the victims primarily through electronic evidence.

On June 14, 2017, a DNA swab was collected from shell casings collected from the original scene. The swab was submitted to the Forensic Biology unit and a fourth suspect was identified. This analysis constituted the first time that a swab from an expended shell casing (fired bullet) was successfully tested for DNA in Montgomery County. The reason that this analysis was successful relates to the increases in the sensitivity of evolving DNA analysis technology. The 4th suspect was arrested on 12/1/2017.

Units Involved - Crime Scene Unit, Firearms Examination Unit, Forensic Biology Unit, Electronic Crimes Unit, and Latent Print Unit

On September 4, 2017 Laura Elizabeth Wallen was reported as a missing person. Ms. Wallen was a teacher in Howard County who resided in Montgomery County. Ms. Wallen was 4-months pregnant with an unplanned pregnancy. Close friends who were concerned that they hadn't been able to get in touch with her filed the report.

On September 7, 2017, Ms. Wallen's vehicle was located at the Columbia Mall. Ms. Wallen's boyfriend/fiancé at the time, Tyler Tessier, was developed as a suspect. Mr. Tessier was employed at meat processing facility in Montgomery County. An evaluation of cell phones, photographs and electronic information by the Electronic Crimes Unit was able to put Ms. Wallen and Mr. Tessier in this location at or near the time of her disappearance.

On September 13, 2017 a shallow grave was located on the business property. Within the grave, was a female matching the description of Ms. Wallen. The grave appeared to have been dug with equipment from the business. On September 14, 2017, members of the Crime Scene Unit responded to the OCME and were able to capture elimination fingerprints, which were later identified by the Latent Print Unit as belonging to Laura Wallen. The OCME ruled Ms. Wallen's death a homicide as the result of a single gunshot wound to the head.

A total of seventeen (17) calls for forensic service were completed in relation to this case. On September 6, 2018, on the morning before he was to stand trial for the death of his pregnant girlfriend, Mr. Tessier was found deceased in his cell from an apparent suicide.

Units Involved - Crime Scene Unit, Firearms Examination Unit, Electronic Crimes Unit, Latent Print Unit

6) **Staffing and resource challenges**

Recruiting, hiring, training, and retention in relation to staffing are some of the largest challenges posed to the MCPCL. As mentioned above, each of the disciplines represented in the MCPCL is staffed by personnel who are mandated to possess very specialized skills, abilities, education, and training. This combination is specific for each discipline, and creates a very small community of specialists from which to recruit/hire. As a result, employers are constantly looking to recruit new employees from the ranks of other employers. In recent years, the MCPCL has both recruited new employees from other police agencies, and lost employees to other law enforcement agencies.

When the MCPCL hires a new employee who does not have previous experience, but meets the education requirements, the in-house training program runs from 6 months to 2 years (before the new lab employee begins completing any work). The training involves the MCPCL's protocols, reporting, and processes. The training includes comprehensive testing for the employee's competency. Most all of the training requirements and competency standards are set by the MCPCL's accrediting bodies, entities that set laboratory standards (OSACs, FBI, ATF, etc.), and the State of Maryland. If a new employee is hired with previous experience, the training program may be shortened at the discretion of the Technical Leader and Lab Director, but still lasts a considerable length of time. As a result, any new analyst who is hired does not actually begin producing work product for a long period of time. This training period also costs time committed by the other employees involved in the training.

The extensive training required after a successful recruitment and hiring process, is compounded by the constant backlog of cases that exists in every unit within the MCPCL. Several units, such as the LPU, Chemistry Unit, and CSU remain fairly static in their caseload. Each of these units' remains backlogged, but the case loads are steady. For example, it would seem like the Chemistry Unit would have fewer cases due to the de-criminalization of marijuana, however, the difference in the caseload has been balanced by the fact that many substances analyzed in recent years by the Chemistry Unit contain many different compounds. The current trend includes controlled dangerous substance samples containing more than one type of CDS.

The advancement of technology has, however, substantially increased the caseload of other units, such as the Biology Unit and the ECU. In the DNA field,

advancements equipment and assay have increased the ability of the Unit to successfully complete testing that was not possible in the past. The DNA profile recovered from an expended shell casing mentioned above is one example. The technology associated with electronic devices seems to advance on an almost daily basis. As more data is stored, and electronic devices are used for increasingly more functions, the opportunity to recover evidence of criminal activity increases. The technology increases also complicate the recovery of information from electronic devices, causing more time spent in analysis.

Recent and anticipated changes in legislation in regards to the testing of PERK kits has placed a burden on the Biology Unit and other portions of the Department. MCP has collected and stored PERK kits for several decades. For different reasons, many of the kits were not sent for analysis. One of the most common reasons involved situations in which the suspect was known. While other agencies may have disposed of untested kits, the Montgomery County Police retained the untested kits. As a result, MCP retained a higher number of untested kits than other agencies. The MCPCL began working within MCP and with the County to obtain additional funding to outsource the analysis of the untested kits in 2017-18. In addition to the increase in funding needed, the time spent on preparing the kits to be outsourced and processing the results upon the return of the kits so qualifying profiles can be entered into CODIS, has affected the ability of the lab to test and analyze evidence from other types of crimes.

7) The use of public DNA databases

The Biology Unit has coordinated with the Major Crimes Division and the Special Victims Investigative Division to utilize services from Parabon NanoLabs, located in Reston, Virginia, to further pursue investigative leads in homicide and rape cases where our Department resources have been exhausted producing no additional leads. This private lab takes a portion of the DNA extract from a probative sample identifying the unknown perpetrator, such as semen on a vaginal sample, and performs a DNA Phenotyping Service. This service generates a DNA profile that provides phenotypic information about the perpetrator such as pigmentation, face morphology, eye color and additional forensic traits. In addition, DNA information is obtained that is compatible to upload into a public DNA database such as GEDmatch.com. This public database has been historically used to assist individuals in finding related individuals for ancestry purposes, such as building family trees. Uploading data to this database is completely voluntary and the site provides a clear disclaimer that when a citizen uploads their data, they agree that the information may be accessed by law enforcement to identify a perpetrator of a violent crime (homicide or sexual assault) or identify the remains of a deceased individual. Users of GEDmatch are also aware that they are uploading their own DNA codes to an open source web site that is freely accessible. Additionally, when Parabon identifies a relative of an unknown suspect by accessing open source

information on GEDmatch, there is no requirement for the person who placed their own information on the web site to speak with law enforcement. Parabon NanoLabs has conducted a search of GEDmatch and provided their genealogy services to assist potentially building family trees of individuals related to the perpetrator from our qualifying homicide or rape cases. Success has been achieved in major crimes for the Department to date where all leads were exhausted and the DNA profiles were in CODIS (a non-public database run by the FBI) and did not obtain any hits (lack of investigative information). To date, MCP has closed a series of violent sexual assaults (most of the victims were elderly), and a sexual assault/murder with the assistance of this process.

8) Quality Control, accountability, oversight practices

The Montgomery County Police Crime Laboratory must maintain compliance with the following requirements:

- Maryland State regulations (i.e., Code of Maryland, Title 10 Department of Health and Mental Hygiene, Subtitle 51 Forensic Laboratories – also referred to as COMAR 10.51)

- ISO/IEC 17025 International Standard: General Requirements for the Competence of Testing and Calibration Laboratories

- ASCLD/LAB-*International* / ANAB Supplemental Requirements for the Accreditation of Forensic Science Testing Laboratories

- FBI Quality Assurance Standards (QAS) for Forensic DNA Testing Laboratories

- As applicable, guidance documents for other applicable regulatory authorities

The Crime Laboratory is responsible for ensuring its ongoing compliance with the above regulations. Accordingly, the Laboratory conducts annual internal audits of its activities to verify that its operations continue to comply with the requirements of its own management system, COMAR 10.51 requirements, the ISO/IEC 17025 International Standard, and the ASCLD/LAB-*International* / ANAB supplemental requirements. The internal audit program addresses all elements of the management system, including the testing activities. In addition, the Laboratory conducts an internal FBI QAS for DNA Testing Laboratories audit when an external QAS is not conducted.

In addition to the annual internal auditing requirement, the Crime Laboratory must comply with the following external audit schedule:

Organization/Audit Focus	External Audit Schedule Requirement
ANAB (Accrediting Body)	Annual assessment/audit - Onsite every other year - Remote/surveillance every other year
Maryland Department of Health (MDH)	Annual survey/audit – either onsite or remote
FBI QAS Audit	An external QAS audit must be conducted at least once every two years; a QAS audit must be conducted annually
National DNA Index System (NDIS)	Upon notification

Examples of elements assessed during Laboratory audits are as follows:

- Quality assurance program
- Organization and management
- Personnel
- Facilities
- Evidence control
- Evaluation of instrument calibration and maintenance records
- Adequacy of case file and report review activities
- Testimony monitoring activities
- Proficiency testing program activities
- Assessment to ensure that new technical procedures have been validated
- Audit of each Unit's technical operations
- Corrective actions

9) Evidence storage

When evidence is collected by MCP it is entered into an evidence management system and sent to be stored at the Evidence Unit. When requests for analysis of the evidence are submitted by officers or detectives, the analyst assigned by the MCPCL makes arrangements for the item to be moved into temporary storage locations within the Laboratory. For example, the FEU maintains a secure evidence storage area for firearms near their workspace and the Biology Unit makes arrangements for PERK kits to be brought to the lab for testing. Additionally, the Chemistry Unit maintains a drug vault which houses all CDS evidence for the Department. The ECU maintains vast amounts of digital evidence on a server built by and maintained by County DTS. The server does not have a back-up function, and is quickly approaching capacity.

10) Needs moving forward.

As noted earlier, staffing is one of the main challenges facing the MCPCL. The challenges include recruitment, hiring, training periods, and retention. The staffing can

also be discussed in terms of front line analysts and supervision. The MCPCL has the flattest chain of command as compared to the other local law enforcement crime laboratories in the State. For many years, MCP worked to establish mid-level supervisors over each of the units and in between the Director and the employees. Last year, the MCPCL submitted requests to upgrade two unfilled positions to newly created supervisor positions over the Biology Unit and the Chemistry Unit. The requests were successful in that the positions were created, but they are currently awaiting exemptions to fill the positions. Both positions would then most likely lead to a trickle down affect which would create new openings in the Technical Leader positions, and the front line bench positions. Additionally, the County has granted the MCPCL one additional position within the Biology Unit.

The creation of the supervisor positions over the units also creates the opportunity for current employees to advance within their fields. It is anticipated that this will assist in alleviating the retention issues mentioned earlier. The MCPCL's hope is to fill both supervisor positions, and then create a third supervisor position to oversee the comparative science units (LPU and FEU). This would place a supervisor from the pattern analysis discipline directly in a leadership position over these two units. This would also remove the supervision responsibility of these two units from the FSS sergeant. It is our belief that the removal of the supervision responsibility from the sergeant will allow the FSS sergeant to focus more directly on the CSU and possibly increase interest in future applicants for the sergeant position.

Additional positions are needed in ECU and CSU. These needs are deemed more critical than others due to the advancement of technology affecting the work of ECU, and the 24 hour on-call nature of CSU. Hiring for all positions is also made more problematic by the lengthy nature of the required training periods. When the County has implemented hiring freezes, it has had an especially negative affect upon the MCPCL by pushing back the already cumbersome hiring and training process. In some instances, candidates for hire who had been scored among the most desirable, left the process and were not hired. Currently, the MCPCL has two open supervisor positions (Biology and Chemistry), two open LPU analyst positions, 3 open CSU specialist position (and a fourth position being created by another employee who has just advised that they are taking a position in another state), one open ECU sergeant position, one upcoming open position in the Biology Unit, and one open chemist position in the Chemistry unit.

In addition to more detectives, the ECU is in need of a dedicated and redundant (backup) storage capability. The electronic evidence stored by the unit is, in almost all cases, very sensitive in nature and vulnerable to hacking. It is also anticipated that the current storage capacity will reach its maximum in the near future.

The pay rates among MCPCL employees specializing in the different disciplines is not consistently at the top of the range for the NCR region. This has an obvious effect upon retention. There are also significant variations between the pay grades of different personnel within the MCPCL. While all Laboratory analysts are required to possess specific education and inherent skills, there exists a lack of pay parity between the disciplines. The vast majority of crime laboratories across the United States have established one class specification to cover all of the disciplines. New Army analytics are an example of the oncoming expansion of statistical analysis in the pattern analysis science field, further shrinking the differences historically cited between disciplines. Class uniformity would also assist in the retention of employees. The MCPCL is currently submitting request for a work study of the LPU.

Another area of concern is the maintenance of current technology and the acquisition of new equipment to keep the MCPCL on the cutting edge of work performed in the discipline. As mentioned above, technology in several fields continues advancing and new equipment, with the training and skill to use it, will be needed in the future. Maintaining the current equipment life cycle must also be sustained to ensure that analyst productivity is maximized. Next generation sequencing, Dart/MS/MS and Recover Latent detection technology are examples of newly expanding capabilities that will impact the disciplines in the future.

Besides equipment, the expanding requests for service would be well served by continued expansion of software and database service capabilities. The addition of a LIMS (Laboratory Information Management System) and/or expansion of the evidence management system, including electronic submission and reporting will yield significant benefits if fully implemented.

Master Lease: Digital Evidence Data Storage
(P342001)

Category	General Government	Date Last Modified	03/14/19
SubCategory	Technology Services	Administering Agency	Technology Services
Planning Area	Countywide	Status	Planning Stage

	Total	Thru FY18	Rem FY18	Total 6 Years	FY 19	FY 20	FY 21	FY 22	FY 23	FY 24	Beyond 6 Years
EXPENDITURE SCHEDULE ($000s)											
Other	750	-	-	750	-	750	-	-	-	-	-
TOTAL EXPENDITURES	**750**	-	-	**750**	-	**750**	-	-	-	-	-
FUNDING SCHEDULE ($000s)											
Short-Term Lease Financing	750	-	-	750	-	750	-	-	-	-	-
TOTAL FUNDING SOURCES	**750**	-	-	**750**	-	**750**	-	-	-	-	-

APPROPRIATION AND EXPENDITURE DATA ($000s)

Appropriation FY 20 Approp. Request	750	Year First Appropriation	
Cumulative Appropriation	-	Last FY's Cost Estimate	-
Expenditure / Encumbrances	-		
Unencumbered Balance	-		

PROJECT DESCRIPTION

The volume of digital evidence has grown exponentially in recent years with the implementation of body worn cameras and increased storage capacity of personal devices including cellphones and laptops. To manage the volume of data, the County requires additional storage capacity through the use of network attached storage and additional servers.

ESTIMATED SCHEDULE

Hardware will be purchased in FY20.

PROJECT JUSTIFICATION

This investment addresses FY20 data storage requirements as the County develops a long term solution.

FISCAL NOTE

This project provides appropriation authority for a purchase funded through the Master Lease program. Master Lease payments will be appropriated through the FY21 Operating Budget.

COORDINATION

Department of Technology Services, Department of Finance, State's Attorney's Office

Police Use DNA to Predict Appearance of Suspect in 1989, 1994 Rapes, Murder

Detectives Seeking Public Assistance in Cold Cases

BY **DANIELLE E. GAINES**   Follow @DanielleEGaines | Published: 2018-07-09 11:00 | 0

Montgomery County police are trying to solve three decades-old crimes with a computer-generated composite based on DNA left at two of the three scenes.

Detectives from the department's Cold Case Squad released the image of a man suspected of rape, sexual assault and murder based on DNA from Rockville crime scenes dating back to 1989.

Police believe three crimes in 1989 and 1994 were committed by the same man:

Police released these DNA-based composite sketches of a man suspected of rape and murder in 1989 and 1994. The sketches are predictors of the man's appearance at age 25 (left) and 45.

VIA MONTGOMERY COUNTY POLICE

- On June 25, 1989, at approximately 10:15 p.m., a 52-year-old woman was walking on Lewis Avenue in Rockville when the suspect approached her from behind, assaulted her, and then raped her. DNA evidence was recovered in that case.

- On Sept. 19, 1994, a 25-year-old woman was walking on Twinbrook Parkway around 10:20 p.m. when the suspect approached her from behind while armed with a knife. The suspect dragged her to the side of her residence where he attempted to rape her. The victim successfully resisted the assault, fled, and called police.

- On Oct. 3, 1994, Le Bich-Thuy, 42, was found dead outside her home in the 1600 block of Martha Terrace in Rockville. Police discovered that Bich-Thuy had been assaulted, raped, and then strangled. Police believe she was last known to be alive around 10 p.m. on Sept. 28, 1994, as she left the Twinbrook Metro station. The suspect's DNA was also recovered in this case.

Creating a composite

Based on a DNA analysis, police concluded that the same suspect had committed the crimes in 1989 and the 1994 rape and murder of Bich-Thuy.

Recently, detectives gave the DNA to Parabon NanoLabs, a DNA technology company in Virginia, which uses DNA phenotyping to predict the physical appearance and ancestry of a person.

Parabon–using predictions about the suspect's ancestry, eye color, hair color, skin color, freckling, and face shape–created the composite photo released by police Monday.

While a potentially useful tool, police cautioned that the snapshot used assumptions about the suspect's age and body weight, which cannot be determined from DNA. The snapshots are also not considered an exact replica of appearance, which can be altered by factors like smoking, diet, drinking, facial hair and hairstyle.

Nevertheless, detectives released the composite with the hope that someone will recognize the suspect and provide information to investigators.

Police asked anyone with information about the suspect or the investigation to contact the Major Crimes Division at 240-773-5070. Anonymous tips may be made to Crime Solvers of Montgomery County, which is offering a reward of up to $10,000 for information that leads to the arrest of the suspect. Crime Solvers of Montgomery County can be reached at 1-866-411-8477 (TIPS).

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Cold Case Detectives Identify Suspect of Unsolved Rapes and Murder; DNA and Genealogy Helped Solve the Crimes

Posted on **03/15/2019** by **mcpnews**

Detectives from the Major Crimes Division – Cold Case Section have identified the suspect who committed a 1989 rape of a 53-year-old female and the 1994 rape and murder of 44-year-old Le Bich-Thuy. The suspect, identified as **Kenneth Earl Day,** died in March 2017 in Upshur County, West Virginia, at the age of 52.

The two unsolved crimes in which Day has been determined to be the suspect are:

- Rape
    - On June 25, 1989, at approximately 10:15 p.m., the 52-year-old victim was walking on Lewis Avenue in Rockville when the suspect approached her from behind, assaulted her, and raped her. Suspect DNA evidence was recovered.

- Rape and Homicide
    - On October 3, 1994, Le Bich-Thuy, age 42, was located deceased to the side of her home in the 1600 block of Martha Terrace in Rockville. The investigation by detectives revealed that Le Bich-Thuy had been assaulted, raped, and then strangled. Investigators further determined that Le Bich-Thuy was last known to be alive at approximately 10:00 p.m. on September 28, 1994 as she left the Twinbrook Metro Station in Rockville. Suspect DNA evidence was recovered.

During the investigation of these crimes, an analysis of the suspect DNA left at these two scenes determined that the same suspect committed both rapes and murder. The suspect's DNA was entered into a national DNA database (Combined DNA Index System – CODIS) but there was no match. Despite extensive investigative efforts, these cases remained unsolved.

In 2017, Cold Case detectives sought the services of Parabon NanoLabs (Parabon), a DNA technology company in Virginia that specializes in DNA phenotyping, or the process of predicting physical appearance and ancestry from unidentified DNA evidence. Using the suspect's DNA left at these scenes, Parabon's Shapshot DNA Phenotyping Service produced what is referred to as a *Snapshot composite* depicting how the suspect in these cases may have looked and predicting his ancestry. In hopes of generating new leads in these cases, detectives released the composite to the public and hoped that someone would recognize him.

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More recently, Parabon submitted a genetic data profile of the suspect's DNA to the publicly available genetic genealogy database, *GEDmatch*, in order to potentially find individuals who shared a significant amount of DNA with the unknown suspect.

Additional investigation, which included genealogy research, was then conducted by Cold Case investigators and led to the identification of Day as the suspect of these rapes and murder.

It was determined that Day had died in Upshur County, West Virginia, in March 2017. Detectives obtained a sample of Day's DNA taken from his autopsy. The Montgomery County Department of Police – Crime Laboratory processed Day's DNA and determined that it was a positive match to the suspect's DNA profile taken as evidence from both crime scenes.

At this time, the Cold Case Section continues to investigate Day's possible involvement in other unsolved crimes. Photographs of Kenneth Earl Day taken at various dates and a list of Day's prior known addresses with the approximate dates he lived at those locations are below.

Anyone with information about Kenneth Earl Day is asked to call the Montgomery County Department of Police – Major Crimes Division, Cold Case Section at **240-773-5070**. Callers may remain anonymous.

Prior known addresses for Kenneth Earl Day with approximate dates:

1989: 500 block of Beall Avenue, Rockville, MD 20850

1988: 100 block of Willowdale Drive, Frederick, MD 21702

1990-1991: 20000 block of Frederick Road, Germantown, MD 20876

1990: Unit block of Whetstone Drive, Gaithersburg, MD 20877

1992: 11700 block of Zebrawood Court, Germantown MD 20876

1993-1994: 12300 block of Selfridge Road, Silver Spring MD 20906
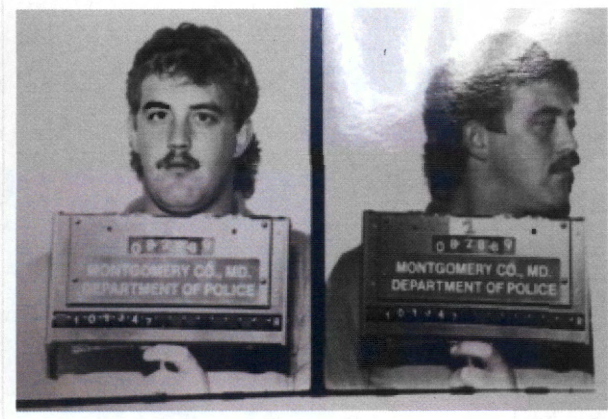
1994-2000 block of Baltimore Road, Rockville, MD 20851

1997-1999: 14400 block of Belvedere Drive, Woodbridge VA 22193

2002-2004: 11800 block of Renner Road, Keymar, MD 21757

Late 2000's: 10300 block of Mumma Ford Road, Rocky Ridge, MD 21778
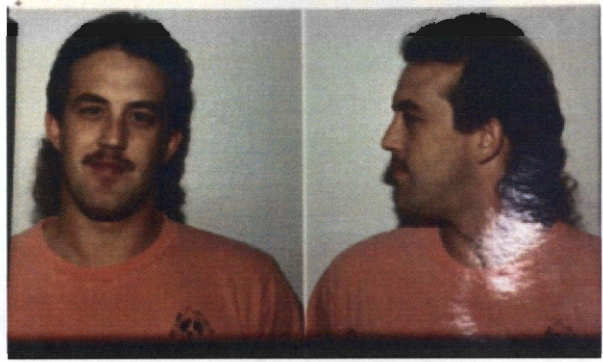
Late 2000's: Unit block of Heavner Grove Road, Buchannon, WV 26201

— Kenneth Earl Day – 1989 – age 24

— Parabon composite
of suspect at 25
years of age.

— Kenneth Earl Day – 1994 – age 29
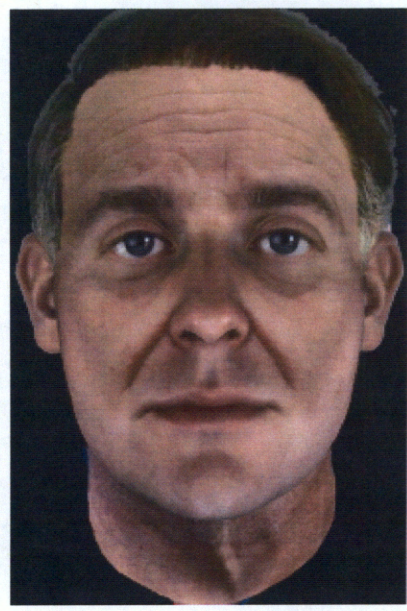

— Kenneth Earl Day – 1999 – age 34

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— Kenneth Earl Day – 2001 – age 36

— Kenneth Earl Day – 2003 – age 38

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—   Kenneth Earl Day – 2005 – age 40

—   Parabon composite of suspect at
        ~60 years of age.

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