

Ballistics IQ from a Forensic Firearm and Tool Mark Examiner's Perspective

By Rocky Edwards and Stephanie Luehr, *Evidence IQ*

September 1, 2020

The ability to give law enforcement actionable and timely investigative information to aid in a shooting incident is the ultimate benefit for a Firearms Examiner. Efficient use of time is critical in solving crimes. This is often difficult due to laboratory policy and lack of resources (such as personnel). However, with advancing technology, and a passionate group of people, a solution has been created to fill the gap and help combat gun crime. This is the driving force for the creation of Ballistics IQ (previously known as BallisticSearch™). The purpose of this article is to explain this product or “solution” from a Firearms Examiner’s perspective. The two authors of this article are Senior Forensic Firearm and Tool Mark Examiners employed by Evidence IQ, with collectively more than 46 years’ experience. Edwards and Luehr are Subject Matter Experts in the field of Firearm and Tool Marks and are the Managers of the Virtual Correlation Center (VCC). The VCC is comprised of highly regarded and experienced Senior Firearm Examiners throughout the United States who are available 24/7 to review firearm-related submissions from the submitting agencies utilizing the Ballistics IQ System.

Ballistics IQ is a powerful, cost-effective, and innovative solution designed specifically to combat gun crime and to provide law enforcement agencies both domestically and internationally with cutting edge investigative capabilities. Ballistics IQ allows a user to access software to scan fired cartridge cases collected at a crime scene or test fired from known firearms. Hence, cartridge cases are compared forensically to determine the number of unique firearms, possibly what type of firearm(s), which cartridge case is best suitable for entry into the National Integrated Ballistic Information Network (NIBIN), and searches for potential links between cases. Once the cartridge cases are imaged into the system, Ballistics IQ uses advanced scientific algorithms to provide almost immediate triage results.

Ballistics IQ capabilities include the following: 1) **Mobility**, 2) **VCC Access**, 3) **Timely Results**, 4) **Cost Effective**, 5) **Triage**, 6) **Documentation**, and 7) **CrimeConnect IQ**.

MOBILITY is a key component for Ballistics IQ. The product is essentially a portable capture station with a camera that acts as a microscope and has a scan time of approximately thirty seconds per cartridge case. Ballistics IQ can be deployed at a crime scene, in a vehicle, office, or laboratory setting and is linked to a laptop/computer with a USB connection and Wi-Fi access. However, if Wi-Fi is unavailable, the cartridge casings can still be scanned and then later uploaded to the Ballistics IQ server and then the case can be generated. This portable capability is crucial in situations of mass shootings or high-profile cases where identification of the number of firearms and type of firearm is urgent in the investigation. Several law enforcement agencies have deployed Ballistics IQ in the field at crime scenes and have utilized the strength of this technology, and the expertise of the VCC, to generate actionable investigative intelligence before they return to their offices.



Another example of mobility is that Ballistics IQ provides NIBIN agencies who support outside departments with forward deployment capabilities throughout a county, region, or state. Thus, a Firearms Examiner from another laboratory system can maintain custody of evidence, visualize, compare images, and make recommendations to a submitting agency without having the physical evidence transferred to the state, city, or county laboratories. A key aspect to mobility is providing remote capabilities so that minimal contact is needed between personnel to obtain actionable investigative leads for firearm related incidents necessary in these trying COVID-19 times and when agency budgets are strained. Ballistics IQ is designed specifically to work in conjunction with NIBIN and for law enforcement agencies that do not have direct NIBIN support.



VIRTUAL CORRELATION CENTER (VCC)

access is the backbone of Ballistics IQ. The VCC allows an agency the option to have their CSA reports reviewed by remote, experienced Senior Firearms Examiners from across the country. The majority of agencies utilize the VCC, but if an agency employs its own Firearms Examiners then the VCC may not be necessary. Once an agency requests a CSA Report, the

preliminary report can be utilized by in-house Firearms Examiners or sent to the VCC. The VCC reviews the CSA report for accuracy and searches for potential links within the Ballistics IQ database.

The team of experienced Firearms Examiners that form the VCC have over 200 years' combined experience and have worked cases on city, state, and federal levels within their discipline. These examiners are highly respected. Numerous VCC examiners are certified members of the Association of Firearms and Tool Mark Examiners (AFTE), and many hold influential committee positions within AFTE and other associations. The VCC team functions as checks and balances for Ballistics IQ. Additionally, quality assurance checks are in place from a managerial aspect and wide spread laboratory practices, procedures, and terminology within the field of Firearms and Tool Marks Identification are implemented into VCC casework.

Through the virtual comparison tool, images of the comparisons can be included with annotations and added to casework. The documentation provided by Ballistics IQ has been used in successful criminal prosecutions in court systems nationwide.

TIMELY RESULTS are a hallmark that sets Ballistics IQ apart from other solutions. Contractually, the VCC is guaranteed to have your results back within 24 hours of submission, however the average turnaround time of most cases is within 2-3 hours. On many occasions, detectives and investigators working active crime scenes are informed of Ballistics IQ results and have useful, actionable intelligence available to them before they conduct suspect interviews and interrogations. This is an essential tool for preliminary investigations while questioning witnesses and potential suspects and for developing investigative leads to solve violent crimes.

COST EFFECTIVENESS is often the bottom line in most government agencies' budgets. The cost of the solution is based on the number of sworn officers within the agency, intentionally and strategically priced to be affordable for the smaller and mid-sized agencies that are in need of assistance with shooting incidents.

TRIAGE is an incredibly important step in investigating a shooting incident. Crime scene triage includes determining what an investigator immediately needs to know when he/she arrives at a shooting crime scene: How many shots fired? How many guns are involved? Can it be determined what types of firearms were used at the scene? How many shooters are we looking for? Is this case linked to another shooting incident?

The ability to rapidly link separate shooting incidents could lead to a suspect being identified quickly, which may prevent further criminal activity. A critical aspect of this system is the Crime Scene Analysis (CSA) report documentation provided for every triage submitted to Ballistics IQ. After a case has been triaged, the submitting agency can now submit only recommended cartridge cases identified by Ballistics IQ and/or the VCC for entry into NIBIN or for confirmation by a Firearms Examiner at a laboratory.

Submitting the best casing verified by the VCC reduces the quantity of firearms evidence submitted for comparison and NIBIN entry, and by providing the laboratory documentation of the preliminary results from the VCC, agencies can devote time and energy to other duties and be assured that submissions to NIBIN are the best quality as determined by experienced Ballistics IQ VCC Firearms Examiners.

DOCUMENTATION is a vital part to forensic case work. The 2009 National Academy of Science Report, *Strengthening Forensic Science in the United States: A Path Forward* and the 2016 President's Council of Advisors on Science and Technology (PCAST) Report on Forensic Science in the Courts, and various court cases have restricted firearms testimony due lack of documentation. Increasing firearms case work documentation is essential to the credibility of the field of Firearm and Tool Mark Identification. Currently, most firearms units and laboratories do **not** have a detailed documented triage system. However, in the times of increased scrutiny in forensics, especially in pattern recognition disciplines, Ballistics IQ provides quality and concise documentation of cartridge casing triage, NIBIN selection, and potential link information.

Additionally, due to efficiency reasons, most laboratories do not photograph every item of evidence. Ballistics IQ provides an image of every cartridge case scanned into the system. This capability reduces time spent by laboratory personnel to document or photograph the firearms evidence, as this function has been performed by the Ballistics IQ Firearms Examiners. The CSA and Potential Link Reports can be added to a Firearms Examiner or Investigator's case notes. For firearm units and laboratories that are not mandated by law to be accredited by a third-party international companies, such as ANAB, that sets standards for laboratory practice and case work, the documentation that Ballistics IQ provides detailed documentation that can be utilized in criminal proceedings. The reports can be used as worksheets that include scans/photography of all items of evidence submitted, case information, and detailed class characteristics.

CrimeConnect IQ is a lead generation investigative tool that specifically aids with pattern-based investigations (Robbery, burglary, narcotics, gangs, firearms violence). Is a companion solution that is integrated with an agency's Report Management System (RMS) and is a comprehensive system that incorporates laboratory and forensic data, and firearms information to include National Integrated

Ballistics Information Network (NIBIN), Ballistics IQ, and E-Trace reports, as well as other products. This new lead generating solution provides the ability for information to be automatically uploaded from Ballistics IQ and plotted geographically on CrimeConnect IQ. This gives detectives, investigators, and crime analysts never-before-seen experiences in search capabilities. CrimeConnect IQ can be integrated with other third-party data sources such as License Plate Readers (LPR) and Facial Recognition Software and provides the ability to upload NIBIN data as well.

FINAL NOTES

Since the release of Ballistics IQ in August 2019, the VCC has reviewed: 807 CSA Reports, found 65 Potential Links, identified 826 unique firearms, reviewed 4,249 fired cartridge cases from agencies nationally and internationally and is steadily climbing. Ultimately, agencies that use Ballistics IQ are generating actionable investigative leads quickly that results in solving firearms related crimes, which make their communities safer.

As a Firearm Examiner, we only wish we had Ballistics IQ in our arsenal of tools available while working cases years ago. This product is a must have for any size agency and we highly recommend those that are in need to request a demo, start a trial, and join the Ballistics IQ Team.