

# **Maryland Shell-Casing Reference Database**

## **Forensic Sciences Division**

**September, 2014**

### **Introduction**

“The Responsible Gun Safety Act of 2000 (HB 279/SB 211) mandates that any firearm manufacturer that ships or transports a handgun to be sold, rented or transferred in the state shall include in the box with the handgun in a separate, sealed container a shell casing of a projectile discharged from that handgun and additional information identifying the type of handgun and shell casing. Upon receipt of the handgun, the dealer shall confirm with the State Police that the manufacturer has complied with this provision [not practiced]. Upon sale of the handgun, the dealer shall forward the sealed container to the State Police Crime Laboratory [Forensic Sciences Division], where it will be entered into all pertinent databases.”<sup>1</sup>

### **Scope**

This report addresses the Maryland State Police (MSP) Forensic Sciences Division’s (FSD) mandated role to enter shell-casings, submitted in compliance with the Responsible Gun Safety Act of 2000, into all pertinent databases. It is inclusive of each component of the process referred to as the Maryland Shell-Casing Reference Database (MSRD) and summarizes the results of this databasing process.

---

<sup>1</sup> The Johns Hopkins Bloomberg School of Public Health, Center for Gun Policy and Research (2002, revised), *The Maryland “Responsible Gun Safety Act of 2000” Summary*.

## **Submission**

At the time of sale, dealers complete an MSP Form 77R that documents the details of the sale. The form is submitted to the FSD, along with the required shell-casing, by mail or private delivery service. The shell-casing resides in a sealed, labeled coin envelope prepared by the manufacturer. Submissions are received by FSD staff that opens the outer packaging and removes the 77R and shell-casing. Next, a quality assurance review is performed to ensure that the submitted shell-casing correlates with the associated paperwork. If the information is accurate, the shell-casing is assigned a barcode MSRD number used by the FSD. Batches of 150 shell-casings are established in numbered storage boxes. Once a box is full, the shell-casings are ready for database entry.

## **Demographic Database**

The MSRD includes a limited access, demographic database containing textual information only. The information used to populate this database is derived from the FSD, the Form 77R, and the shell-casing envelope. This information includes the person performing the data entry, date of data entry, MSRD number, storage box number, make, model, caliber, rifling characteristics, serial number, application number, dealer, test fire technician, and test fire date. The FSD does not record any information identifying the purchaser/registrant of the firearm. The demographic database has been consistently maintained from 2000 through the present.

## **Retention**

After the data entry associated with a batch is completed, the numbered box containing 150 shell-casings is sealed and stored in a long term storage facility located at the MSP Headquarters. The 77R forms associated with the shell-casing in that batch are destroyed.

### **Imaging Database (Inactive)**

In support of the Responsible Gun Safety Act of 2000, the MSP acquired a ballistics imaging system to create digital records of shell-casings from new handgun purchases in Maryland. This digital record would capture the unique identification marks imprinted on the submitted shell-casing. Shell-casings recovered during the investigation of a crime could then be imaged and searched with the hope of matching a shell-casing image from a firearm known to have been sold in Maryland. By cross matching the imaging database with the demographic database, law enforcement would be provided with valuable investigative intelligence. Tremendous success has been realized through the application of similar systems using fingerprints and DNA. Unfortunately, the Maryland ballistic imaging database failed to function as designed. As a result, imaging was ceased in April 2007 and permanently abandoned in 2008.

It should be noted that the FSD does continue to utilize the National Integrated Ballistic Information Network (NIBIN) database established by the Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATFE). This is a federal imaging database system that compares shell-casings between jurisdictions nationwide. Under the Memorandum of Understanding (MOU) between the MSP and ATF, only shell-casings related to a criminal investigation or from weapons confiscated by law enforcement may be entered into the NIBIN database. Shell-casings collected under the Responsible Gun Safety Act of 2000 do not meet this criterion and are specifically prohibited from being entered into NIBIN.

The FSD archived the digital records from the Maryland ballistic imaging database which includes all cartridge casings submitted prior to April 2007. The Division management hoped to identify another system to replace the failed imaging database; however, this has not occurred.

## Current Status of the MSRD

Currently, the MSRD includes 304,548 submissions which have been recorded in the demographic database, packaged, and stored. More than half of the total submissions have been received since 2010. See Figure 1 for a breakdown by year received of shell casings submitted for entry in the MSRD.



Figure 1 - Distribution by year received of shell casings submitted to DSP under HB 279/SB 211

Since 2001, the system has accrued 26 back door hits. Furthermore, within the past four years there have been six back door hits, five of which involved homicides from Baltimore City, Montgomery County, and Prince Georges County. See Figure 3 for a breakdown of back door hits associated with the MSRD by agency and crime type. A 'back door' hit occurs when the investigator contacts FSD examiners with information that a firearm, which has not yet been recovered, may have been involved in a crime. With the information provided, the FSD

examiner searches the MSRD database and retrieves the corresponding cartridge case so that it can be compared to the evidence and matched to the crime. Since the imaging database is inactive, all hits associated with the MSRD are back door hits. The hit rate for the MSRD is 0.0085% (26 hits from a database of 304,548 reference samples). As a point of comparison, the DNA CODIS database in Maryland has a hit rate of 1.8% (approximately a 200 fold difference).

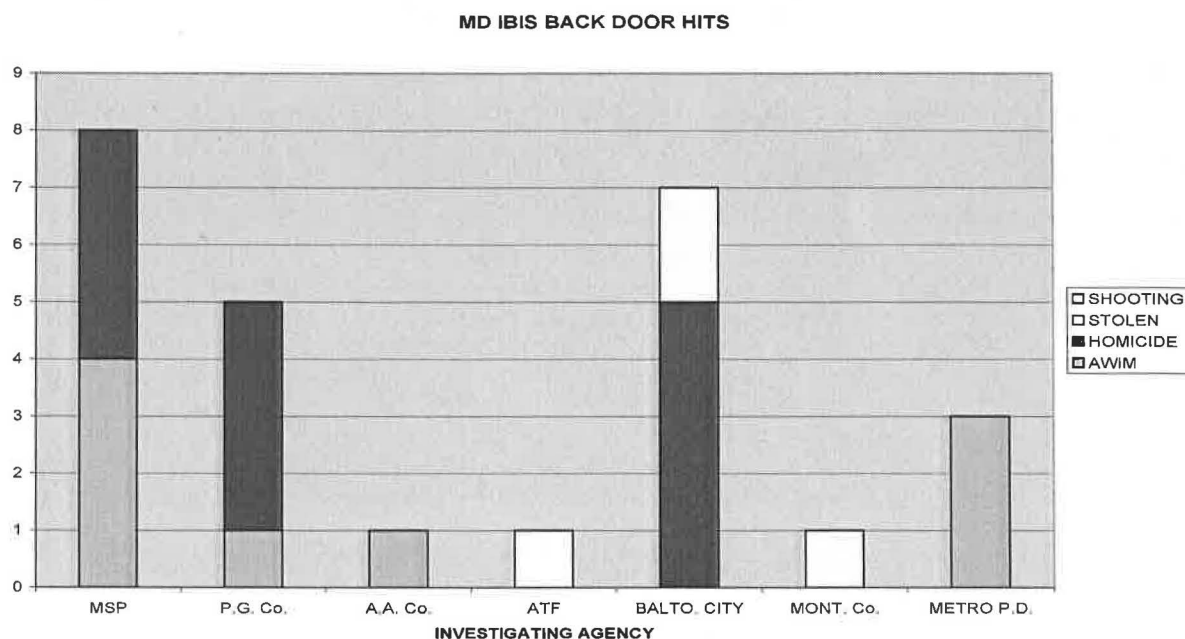


Figure 2 – Distribution of back door hits associated with the MSRD by Agency and Crime Type

Statistics maintained by the ATF reveal that the number of handguns recovered in Maryland crimes has increased each year since 2009. They also report that in 2012 alone there were 8,008 firearm traces conducted in connection with investigations by Maryland law enforcement officials. The average time between the original registration of these firearms and

the inquiry was 12.88 years<sup>2</sup>. Interestingly, this 'time to crime' correlates closely with the current age of the MSRD and therefore an increase in future hits could be on the horizon.

### **Shell-Casing Databases in Other States**

Currently Maryland is the only state with a law requiring a shell-casing submission for new handgun sales. In August 2000, the State of New York enacted a similar law. The New York law was repealed in 2012 and their Combined Ballistic Information System (COBIS) was disbanded. In the end, the state of New York had 380,833 samples in their database with a backlog of 183,002. They had a total of two hits during the 11 years of the program.

Due to interest in adopting a similar program in California, the California Department of Justice conducted studies on automated computer matching systems and ballistic identification systems to determine the feasibility of utilizing a statewide system of firearms data from test-fired and sold firearms. The study identified issues that needed resolution before a system could be implemented in the State of California.<sup>3</sup>

### **Recent Investments in the MSRD**

Within the past year, there have been significant investments made to the MSRD by the state of Maryland. FSD received four new permanent laboratory technician positions as well as four temporary technician positions in FY 14. These additional positions allowed FSD to

---

<sup>2</sup> Department of Justice, Bureau of Alcohol, Tobacco, Firearms, and Explosives, *Firearms Tracing Data 2012*, Maryland.

<sup>3</sup> U.S. Department of Justice, Office of the Inspector General, Audit Division. 2005. *The Bureau of Alcohol, Tobacco, Firearms and Explosives' National Integrated Ballistic Information Network Program*. Washington, DC: U.S. Department of Justice.

eliminate a backlog of approximately 50,000 shell-casings that had accumulated because of the increased gun sales associated with recent gun legislation. In June 2014 the backlog was officially eliminated.

Also in 2014, the MSP Licensing Division (LD) invested significant time and resources to create a much improved firearms license review system referred to as the Information System for Applicant Background and Licensing (ISABL). Within this new system there is a module for FSD that allows for the consolidation of the separate databases historically used by the LD and FSD. This is a major step in being able to accurately track whether or not the required shell-casings have been submitted for each handgun sold in Maryland. Furthermore, ISABL eliminates the need to perform double entry of certain demographic data which reduces both the workload and the potential for data entry errors.

#### **Future Investments Needed for the MSRD**

There are two areas that do need to be addressed if the MSRD program continues. The first is storage space. There are currently over 300,000 shell-casings being stored by FSD and available storage space is quickly being consumed. Either an additional storage facility or a modification to the current storage system will need to be implemented within the next few years. A second area that needs attention is outreach and education about the MSRD. For the system to be more successful, law enforcement throughout the state need to be made aware of this tool for identifying handguns. Investigators need to understand that if they have recovered shell-casings from a crime scene, and they have knowledge that a specific gun was potentially used in the crime, they can request a search of the MSRD when the gun itself is not available.

The recent creation of the Maryland State Police Gun Center to provide law enforcement officials with direction on the investigation of gun crimes could play a pivotal role in this outreach and education initiative, if they are provided with the necessary resources. A noteworthy example would be informing investigators that once a firearm becomes part of an investigation, such as being reported stolen, it becomes eligible for entry into NIBIN and they should contact FSD to have the stored shell-casing imaged. It would be expected that as investigators' awareness of the existence and potential application of the system increases, so too will its use and success as an investigative tool.

### **Conclusion**

While there have only been 26 back door hits in the 14 years since the MSRD came into existence, there is potential for improving the efficacy of the database. The fact that the backlog of shell-casings to be entered has recently been eliminated, significantly improves the pool of reference samples available for comparisons. However, as it is with any forensic database, success is dependent on entry of both reference samples and casework samples. Since there is currently no functional imaging database associated with the MSRD, there is no automated means of associating the casework samples with the reference samples. To that end, were the ATF to support a request from Maryland to relax the restriction on adding images of MSRD reference samples to the NIBIN system, based on the reasoning that the MSRD contains no direct association to an individual or their personal information; then the original vision of the program could still potentially be met. If this is not possible and the MSRD



remains strictly a demographic database, then a decision must be made on whether or not the database's minimal return on investment is significant enough to continue the program.