



# OLR RESEARCH REPORT

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## SMART GUNS

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You asked for information on "smart guns." You were specifically interested in learning the extent to which they are commercially available, their cost, safety, and relevant legislation.

### SUMMARY

Smart guns use a variety of technologies, including biometrics and radio-frequency identification (RFID), to allow a gun to be fired only by its owner or other authorized user. Smart gun technologies have been studied and promoted for two decades but remain in the prototype phase. Smart guns are not commercially available at this time and we have found limited information on their safety and no information on how much they would cost in commercial production.

According to the Law Center to Prevent Gun Violence, a group that advocates for smart guns, Maryland and New Jersey are the only states that have laws addressing smart gun technology. Maryland requires an annual report on the status of smart gun technologies. New Jersey requires on-going monitoring of the commercial availability of smart guns. Once they become commercially available, the law would bar the sale of handguns that do not have their safety features.

In 2000, the Center for Gun Policy and Research at Johns Hopkins University published a model handgun safety standard [act](#) that is similar to New Jersey's law. Legislation similar to New Jersey's law was introduced but not acted upon in California in 1997 (SB 697) and 2001 (AB 1219) and in Pennsylvania in 2011 (SB 931).

## **DESCRIPTION**

“Smart guns,” also known as personalized firearms, are designed so that they can be fired only by authorized users. They are designed to prevent shootings, both intentional and unintentional, by unauthorized users, including children. Another rationale for smart guns is to prevent law enforcement officers' guns from being used by others if the gun is taken in a struggle.

Smart guns can incorporate a variety of designs, including biometric and RFID technologies. Over the past two decades, the U.S. government has spent millions of dollars on grants for research institutions and gun makers to perfect a personalized firearm, mostly on biometric methods that verify that the fingerprint or grip of the user is that of the owner or other authorized user. Some of these technologies rely on batteries, while others use magnetic fields to lock or unlock the gun.

During the 1990s and early 2000s, several gun manufacturers had smart gun development programs, including Colt, Smith & Wesson, and Mossberg & Sons. Between May 2000 and December 2004, the National Institute of Justice's Office of Justice Programs (OJP) granted Smith & Wesson \$3 million to test 50 prototype electronically-fired handguns and research possible biometrics that would fit inside a handgun. A U.S. Department of Justice press release, <http://www.justice.gov/opa/pr/2000/May/263nij.htm>, describes some of OJP's smart gun research initiatives.

Mossberg developed the iGun™, which can detect if an authorized person is holding the gun and only allow that person to fire it. The user wears a ring that triggers power to the iGun™ when the ring comes in close range to the gunstock. When the iGun™ senses that the ring is near enough, it compares a unique code from the ring to the gun to see if there is a match. If the code matches and certain other conditions are met, an electric current from the battery actuates a mechanism to unblock the trigger. The battery pack in the gun is designed to last up to 10 years when not used or up to 8 hours of continual usage. The gun has low-battery indicator.

RFID technologies are currently used for a very wide range of purposes such as employee badges (including those used by legislators to access their offices), vehicle tolling systems such as EZ-Pass, passports, and systems to track packages as they are being delivered. In the mid-1990s, Colt introduced a smart gun prototype using a \$500,000 OJP grant. A few years later, it released a Z40, a semi-automatic pistol with a microchip embedded in its pistol grip. The chip used RFID technology in the form of a radio wrist transponder to prevent unauthorized users from firing the weapon. More recently, an Irish company, TriggerSmart, has patented a system that places a RFID chip in a gun handle and a corresponding chip installed on a ring or bracelet or implanted in an authorized shooter's hand. If the two chips are not within an inch or two of each other, the gun trigger will not unlock.

### **COMMERCIAL AVAILABILITY**

As noted below, Maryland requires its Handgun Roster Board to report annually on the availability of smart guns. In its 2012 report, the board notes that while technology to produce personalized handguns does exist, at least for demonstration purposes, it is still not available in a commercially available 'handgun package.' The report is available at [http://dlslibrary.state.md.us/publications/Exec/MDSP/PS5-132\(d\)\(1\)\(ii\)\\_2012.pdf](http://dlslibrary.state.md.us/publications/Exec/MDSP/PS5-132(d)(1)(ii)_2012.pdf). Similarly, a December 20, 2012 [article](#) by Reuters notes that smart guns are not widely available in the U.S. market.

### **COST**

We have not found any specific data on the costs of smart guns. The Mossberg [website](#) for its iGun™ notes that it:

is a precision-machined firearm with a sophisticated computer and recognition system housed inside...the iGun™ has many custom parts developed just for this project. Expect to pay a premium price for this advanced technology and the benefits that it can deliver.

### **SAFETY**

Ideally, a smart gun would fire every time when used by its owner or other authorized user and would never fire when someone else attempted to use it. We have not found any independent analyses of the safety of prototype smart guns.

Among the safety concerns that have been raised are that:

1. battery-operated technologies generally default to safe, meaning that a smart gun that relies on a battery will not work when the battery has died;
2. some smart gun technologies are not water resistant;
3. biometric scanners generally cannot be used when the user is wearing gloves;
4. RFID can be spoofed or jammed, and because they're linked to a ring or bracelet, can be used by anyone with access to the key; and;
5. neither biometric or RFID systems are instantaneous as it takes time for the controller to disengage the safety on the gun.

## **LEGISLATION**

### ***Maryland***

Maryland law defines a “personalized handgun” as any handgun manufactured with technology incorporated into the design (1) allowing it to be fired only by its authorized user and (2) preventing any of its safety characteristics from being easily deactivated. The state Handgun Roster Board must review the status of personalized handgun technology and report its findings to the governor and the General Assembly annually (Md. Code Ann., Pub. Safety § 5-132).

### ***New Jersey***

In 2002, New Jersey adopted a law to eventually require smart gun technology to be incorporated into all handguns sold in the state. New Jersey defines a “personalized handgun” as “[A] handgun which incorporates within its design, and as part of its original manufacture, technology which automatically limits its operational use and which cannot be readily deactivated, so that it may only be fired by an authorized or recognized user.”

Until the attorney general finds that personalized gun technology is available, he or she must report to the governor and the legislature every six months on the availability of personalized handguns for retail sales.

Twenty-three months after the attorney general finds that smart handguns are available for retail sale, the attorney general and the superintendent of state police must begin the process of promulgating a list of such handguns that may be sold in New Jersey. This process must be completed within six months.

Six months after the initial list of handguns is approved, it will be unlawful for any licensed manufacturer, wholesaler, or retail firearms dealer to transport into New Jersey, sell, expose for sale, possess with the intent of selling, assign, or otherwise transfer a handgun unless it is a personalized handgun (excluding antique handguns and handguns used by law enforcement or military officers) (N.J. Rev. Code §§ 2C:39-1, 2C:58-2.2 et seq.).

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