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August 5, 1994

MEMORANDUM TO JOHN H. GIBBONS AND ALICE RIVLIN

FROM: BRUCE REED

SUBJECT: FY 1996 Research and Development (R&D) Priorities

Thank you very much for the memorandum of May 6, 1994 regarding R&D priorities. There is no question that it is critical to identify and coordinate various initiatives so that guidance may be provided to the agencies as they prepare their FY 1996 budget requests. I feel very strongly, however, that a critical segment has not yet been identified -- the area of law enforcement technology.

This Administration has made the war against crime a top priority and the Crime Bill represents a tremendous opportunity to push crime-fighting technology forward at a Federal level, and also for the Federal agencies to provide guidance and support to states and local entities as they strive to enter the 21st century in law enforcement technology.

Furthermore, expansion in this area ties into other stated goals such as a healthy citizenry (reduced crime levels means fewer associated health costs) and job creation and economic growth (defense conversion, as well as a coordinated supply of contracts and goods to an ever-growing cottage industry in private security). The following is a brief listing of law enforcement technologies that are currently in development, as well as initiatives and strategies that are in the near future:

I. The National Institute of Justice Technology Transfer Program

Attorney General Reno issued letters to the Secretary of Defense and the Director of the Central Intelligence Agency to initiate this program. The letter was in response to a Congressional interest that NIJ work to develop **less-than-lethal** technology. To date, this partnership has produced the following technologies and initiatives:

- * A prototype rear seat airbag to better restrain uncooperative prisoners in back seats of police cars;
- * A prototype barrier strip to safely deflate tires;
- * velocity adjusting weapons to allow the firing of rubber bullets and other projectiles safely from any distance;
- * the creation of teams at the five national laboratories involved in NIJ projects, to better develop these technologies;

The NIJ has also initiated several of its own projects:

- * Development of a weapon that can be fired only by its owner -- so-called "smart guns";
- * disorienting or dazzling light systems with protective eyewear for police;
- * Identification of anesthetic compounds with high safety margins;
- * Better ensuring the efficiency of DNA identification;
- * putting key reference material on CD ROMs;
- * developing, publishing and administering standards for law enforcement equipment such as soft body armor, DNA identification technologies, handguns, handcuffs, police car packages and other equipment.

II. Advance Research Projects Agency (ARPA)/NIJ List for Development

ARPA asked NIJ to look at a list of technologies they were considering for development and identify those items that were enforcement priorities. They included:

- * A device capable of identifying handguns, which has greater discriminating power than existing metal detectors;
- * A range of less-than-lethal technologies (ie. sticky foam);
- * A modified personnel status monitor and remote surgical system, (currently being considered for development for use by military medical personnel) which, if adapted for law enforcement, would strengthen the ability of foot officers to to work in a genuine community policing role, knowing they can get immediate assistance if needed.

III. Memoranda of Understanding

Vice President Gore, in February of this year, brought together Attorney General Reno, Secretary of the Treasury Bentsen and Deputy Secretary of Defense John Deutch to sign two major MOUs.

- * Justice/Treasury MOU

Establishes a new Federal Law Enforcement Wireless Users Group (FLEWUG) to tackle electronic communications data transfer interoperability problems among federal law enforcement agencies.

* Justice/Defense MOU

Established a new Joint Program Steering Group to identify, develop and transfer to law enforcement useful defense technologies. This is a five year commitment. Some of the shared technologies include: less-than-lethal weapons; night vision goggles; smart guns and virtual reality training, simulation and mission planning; and devices that can detect bombs, mines and weapons.

IV. Drug Control Technology

The Office of National Drug Control Policy has been working alone and with other agencies to develop technologies that will have particular effect in fighting drug related crime:

- * **Chemical and biological testing to overcome drug-addiction.** The Counterdrug Technology Assessment Center (CTAC) is working with Columbia University to develop anti-addiction enzymes and brain chemistry at the NIH Addiction Research Center. Additionally, using powerful brain scanning equipment, CTAC and the Addiction Research Center at Johns Hopkins University are attempting to pinpoint where and how the brain is affected by cocaine.
- * **Development of video and audio surveillance equipment.** CTAC is working on an operational prototype system capable of detecting conversations in an urban environment at a much greater distance. Such a technology, in conjunction with improved video surveillance of alleged drug suspects will make drug undercover work safer for officers while providing more reliable evidence for prosecution.
- * **Airborne system for information, navigation and command.** CTAC and the Mayo Foundation in Minnesota, have been working on an enhanced system for law enforcement officers to detect illegal drug trafficking. Using a radio link and employing laptop computers installed in squad cars, surveillance teams would be able to conduct operations while they exchange critical information with a command center at headquarters. From their squad cars, officers would be able to track drug traffickers' vehicles, display city street and building information, receive information about the suspects, and coordinate mobile surveillance teams. This new technology blends satellite

communications, advanced homing devices and computer-generated maps to identify remote locations. Similar systems are being looked at in conjunction with the Yonkers, New York Police Department, Narcotics Branch and with the Department of Defense's Advanced Research Projects Agency (ARPA).

- * **Navigation, surveillance and command systems for use by law enforcement officers.** The Office of National Drug Control Policy (ONDCP) through its Counterdrug Technology Assessment Center (CTAC) is developing new technologies to improve law enforcement response time. This will be done by using sophisticated satellite communications and miniaturized global positioning systems to instantly pinpoint remote locations. (Referenced below).
- * **Increased School Security.** The Department of Education and CTAC are coordinating efforts to improve school security through better and more sophisticated sensor and surveillance technology.
- * **DRUGFIRE and CEASEFIRE - The linking of shooting incidents.**

Drugfire:

CTAC and the Federal Bureau of Investigation (FBI) is developing an enhancement to the existing DRUGFIRE System, which matches weapon-specific markings on cartridge cases typically recovered from crime scenes. The linking of shooting incidents by comparing cartridge cases leads to the identification of those individuals involved in serial shootings. Further work is needed to assure that as more jurisdictions network into the DRUGFIRE system, the database is not overwhelmed.

Ceasefire:

The ATF is developing a comprehensive strategy to provide support to law enforcement in areas of the country experiencing serious gang and drug-related shooting incidents. This strategy provides law enforcement direct access to ATF's resources:

- ♦ National Tracing Center (NTC) provides the means to trace firearms recovered in criminal investigations;
- ♦ The development and implementation of a procedure utilizing the National Law Enforcement Telecommunications System or other communications systems to directly submit trace requests from other law enforcement agencies to the NTC;

- ♦ The Firearms Technology Branch provides expert technical support to ATF, other Federal agencies, State and local law enforcement, the firearms industry, the Congress and the general public.
- ♦ Integrated Ballistic Identification System, which allows for the quicker analysis and matching of bullet signatures.

**EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET
Washington, D.C. 20503**

19 pgs

July 18, 1994

LEGISLATIVE REFERRAL MEMORANDUM

LRM #M-1660

TO: Legislative Liaison Officer -

JUSTICE - Sheila F. Anthony - (202) 514-2141 - 217
ONDCP - Babette Hankey - (202) 395-6739 - 257

FROM: JAMES J. JUKES (for)
Assistant Director for Legislative Reference

OMB CONTACT: RONALD JONES (395-3386)
Secretary's line (for simple responses): 395-3454

SUBJECT: TREASURY Proposed Testimony on Developments
in Firearms Technology .

DEADLINE: 4:00 PM July 19, 1994

COMMENTS: This testimony is for a hearing on firearms
technology on Thursday, July 21. Both Justice and treasury
are testifying.

OMB requests the views of your agency on the above subject before
advising on its relationship to the program of the President, in
accordance with OMB Circular A-19.

Please advise us if this item will affect direct spending or
receipts for purposes of the the "Pay-As-You-Go" provisions of
Title XIII of the Omnibus Budget Reconciliation Act of 1990.

CC:

C. Brown
M. Schwartz
Tim Fain
J. Cerda

RESPONSE TO LEGISLATIVE REFERRAL MEMORANDUM

_____ Concur

_____ No objection

_____ No comment

_____ See proposed edits on pages _____

_____ Other: _____

_____ FAX RETURN of _____ pages, attached to this
response sheet

Mr. Chairman and members of the Subcommittee, thank you for the opportunity to appear today and testify on new developments in technology relating to firearms; specifically, commenting on ATF's "CEASEFIRE" violent crime strategy.

In the past three decades, violent crime has been a constant concern of the American public. In 1967, after 2 years of study, the Commission on Law Enforcement and the Administration of Justice reported that "the existence of crime...and the fear of crime, have eroded the basic quality of life of many Americans."

Now almost 30 years later, whether committed by organized criminals, gangs, or street thugs, violent crime continues to tear at the fiber of civilized society around the world. In the United States, the number of firearms used in armed robberies, assaults, and murders has been escalating at an alarming rate and is now the number one concern of the American public. A National Crime Survey has found that one out of every four households has been affected by violent crime. The most serious incidents are usually confined to certain urban areas, repetitive in nature, and most often motivated by the struggle for power or control over illicit enterprises, such as drug trafficking or other illegal gang activity. This wanton violence, which is spurred by an

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indifference toward human life, is depleting the cultural and material resources of our cities.

By analyzing such information, it is evident that we need an effective and efficient means of thwarting violent crime committed with firearms. ATF, cognizant of its responsibility to maintain a leadership role in firearms matters and to provide assistance to State and local law enforcement, has developed and implemented CEASEFIRE--an enforcement strategy bringing to bear all the investigative and support resources of the Bureau aimed at addressing firearms-related violence. We expect this initiative to significantly contribute to the identification and prosecution of the most active armed violent criminals.

As every person has unique fingerprints, every firearm has unique ballistic characteristics. The barrel of a firearm leaves distinct markings on a projectile as it is expelled during firing. The breach mechanism also leaves distinct markings on the cartridge case. These markings are produced by the breach face itself, the firing pin, extractor, and ejector. Firearms examiners are able to examine bullets and cartridge casings to determine if they were expelled from a specific firearm. It has been a tedious, time-consuming process for those examiners to compare suspect ballistic

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evidence casings recovered at crime scenes to the vast inventory of recovered or test-fired projectiles and casings. The severe stress and eye-strain on the firearms examiner dramatically slows the process. Realizing that the present examination techniques were antiquated, ATF and the Department of Treasury recognized the potential benefits to law enforcement that innovative computerized, crime-fighting technology can provide. This technology can ultimately facilitate an information super highway in the solving of firearms-related violent crimes.

ATF's mission is to reduce the criminal use and illegal trafficking of firearms and to assist other Federal, State, local, and foreign law enforcement agencies in reducing crime and violence by effective enforcement of the Federal firearms laws. ATF has the ability to significantly impact on violent crime through its use of Federal laws that target firearms, armed career criminals, and armed violent offenders through the Bureau's Achilles Program. We are proud of our accomplishments in the fight against violent crime through our partnerships with other Federal, State, local, and foreign law enforcement agencies.

In addition to the enforcement of the Federal firearms laws, ATF has a unique responsibility to regulate the firearms

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industry and to collect the tax revenue generated by the firearms industry. ATF maintains a computer data base of all Federal firearms and explosives licensees in conjunction with the administration of the licensing provisions of Federal law. In addition, ATF is responsible for determining the suitability of firearms for importation and approving the importation into the United States of any firearms from foreign countries. ATF is the Federal agency that oversees and regulates the firearms industry in the United States and is the only agency that has access to all the information required to be maintained by Federal law.

The National Tracing Center (NTC) which provides around-the-clock assistance to Federal, State, local, and foreign law enforcement, provides the means to trace firearms that have been recovered in criminal investigations. ATF is the repository for records of out-of-business Federal firearms licensees in regard to their firearms sales. Since 1972, the Bureau has provided firearms tracing services to both foreign and domestic law enforcement agencies. During FY-93, the NTC conducted 57,000 traces. It is anticipated that during FY-94, the NTC will trace more than 100,000 firearms recovered in crimes worldwide.

The establishment of the NTC has achieved, for law

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enforcement, the most proficient and effective method for researching the movement of firearms. As such, the systematic tracking of firearms from the manufacturer, to the purchaser, provides investigators with valuable leads in identifying potential violations and suspects.

The NTC maintains a reference library to identify firearms, firearms manufacturers, and importers. The NTC contacts manufacturers (foreign and domestic), importers and wholesale and/or retail dealers for disposition, confirms accuracy and extent of trace, and communicates results of traces to the requester. The NTC identifies trends and trafficking patterns that provide investigative leads to the field.

The NTC is also in the development stage of implementing two additional projects to enhance the NTC's overall effectiveness and responsiveness. One of the projects pending is the Firearms Information Networked Databases (FIND). This project was initiated in April 1991 proposing a system that would meet ATF's requirements for effective tracing and tracking of crime guns submitted to the NTC, providing an interface of the existing Firearms Tracing System (FTS) to various ATF-related crime gun data bases. In developing this proposed system, the Bureau seeks to enhance

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ATF's ability to accomplish its mission, collect information from existing and proposed firearms data bases into a single system, allow FIND to search all the firearms data bases and produce responses based on one query instead of the user having to query every data base, and consolidate all of ATF's data and increase data security.

Another ongoing project is the development and implementation of a procedure utilizing the National Law Enforcement Telecommunications System (NLETS) or other acceptable communication system to directly submit trace request from other law enforcement agencies to the NTC.

The ATF Forensic Laboratories conduct firearms, toolmark, and ballistics examinations for ATF and other Federal, State, and local law enforcement agencies. The laboratory supports ATF special agents at crime scenes by providing onsite technical assistance. In addition, laboratories provide technical advice to ATF special agents and other government agencies and give expert testimony in court regarding the results of laboratory examinations and their significance in the investigation.

The Firearms Technology Branch (FTB) provides expert technical support to ATF, other Federal agencies, State and

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local law enforcement, the firearms industry, the Congress, and the general public. FTB is responsible for the technical determination concerning types of firearms approved for importation into the United States. In accordance with the Undetectable Firearms Act, FTB provides the standard for the detectability of firearms. This branch is also responsible for rendering opinions regarding the classification of illegal firearms and newly designed firearms. FTB maintains an extensive firearms reference collection, as well as technical firearms reference files and library, and firearms data bases.

In support of our law enforcement mission and to efficiently link our firearms-related resources, ATF has developed CEASEFIRE, an enforcement strategy that draws upon our expertise in enforcing Federal firearms laws and technological advances. The purpose of CEASEFIRE is to provide support to law enforcement in areas of the country experiencing serious organized criminal gang and drug-related shooting incidents. This strategy provides law enforcement direct access to ATF's:

- * National Tracing Center
- * National Laboratory (Forensics Section)
- * Firearms Technology Branch

Direct investigative support is also provided by special

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agents and Compliance Operations inspectors assigned to local field offices, who work hand-and-hand with their law enforcement counterparts to interdict the illegal proliferation of firearms to solve firearms-related crimes. ATF also provides the U.S. Department of Justice, State prosecutor's offices, district attorney's offices, and military courts with expert firearms testimony from ATF firearms enforcement officers and special agents. This testimony includes the identification and origin of firearms and other matters relating to firearms and the firearms industry.

I have attached to my testimony, for reference, a chart which briefly illustrates how each element of the CEASEFIRE strategy.

In our CEASEFIRE initiative, ATF is utilizing a unique ballistic comparison system that allows firearms technicians to digitize and automatically sort bullet signatures and aids in providing matches at a greatly accelerated rate. This technology expeditiously provides investigators with leads to solve greater numbers of crimes in a shorter period of time. An automated system for shell casing comparison has also been developed and is expected to be added to the ballistic comparison system later this year.

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As every person has unique fingerprints, every firearm has unique ballistic characteristics. The barrel of a firearm leaves distinct markings on a projectile as it is expelled during firing. The breech mechanism also leaves distinct markings on the cartridge case. These markings are produced by the breech face itself, the firing pin, extractor, and ejector. Firearms examiners are able to examine bullets and cartridge casings to determine if they were expelled from a specific firearm. It has been a tedious, time-consuming process for those examiners to compare suspect ballistic evidence to the vast inventory of recovered or test-fired projectiles and casings. The severe stress and eye-strain on the firearms examiner dramatically slow the process. Realizing that the present examination techniques were antiquated, ATF and the Department of Treasury recognized the potential benefits to law enforcement that innovative computerized, crime-fighting technology can provide. This technology can ultimately facilitate an information super highway in the solving of firearms-related violent crimes.

This Integrated Ballistic Identification System (IBIS) will for the first time provide a single system capable of comparing both types of ballistic evidence found at crime scenes. It will permit firearms examiners to quickly enter and review large numbers of fired bullets and expended

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cartridge cases. Evidentiary matches made from projectiles will be accomplished after the system makes 8,100 different comparisons in approximately 4 seconds. For cartridge cases it makes similar types of comparisons in 2 seconds.

The ballistic comparison system does not positively identify bullets or casings fired from the same weapon--that must be done by a firearms examiner. However, the system does produce a short list of candidates for the match. The numerical probability of a match is given for each candidate on the list. By doing automated searches, the system speeds up and optimizes time spent on comparisons. The best evidence in linking a firearm to a specific crime is matching the recovered projectile to the suspect firearm.

The Integrated Ballistic Identification System consists of two separate work stations--a Data Acquisition Station and an Image Analysis Station. The Data Acquisition Station is used to collect image data. It does not retrieve and compare images. Laser optics focus on the bullet's land markings, and a computer digitally maps and records the significant areas on the bullet's surface. These areas are selected and optically "marked" by the firearms examiner as the bullet is viewed while being rotated. Either a firearms examiner or a technician can be trained to enter data from crime scene

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bullets. Once a bullet is cleaned and mounted, it takes approximately 10 minutes to scan the bullet into the system. The system is capable of conducting a comparison of damaged projectiles that has sufficient markings, equivalent to only one LAN marking.

The Image Analysis Station runs the image comparison software, and it houses the data base of images generated by the acquisition station. One analysis station can handle the data from several acquisition stations. Data can be entered into the analysis station from a disk or through a communication line (modem), information processed, and automatically returned to the requester.

As stated earlier, the system does not make identifications, the firearms examiner must make the determination that from a specific firearm. Since, the system produces a list of scores that indicate the relative probability of a match (high to low), the firearms examiner can retrieve selected images for evaluation on the video screen. If the image on the screen looks as though a match could exist, the firearms examiner inspects the specimens on a comparison microscope to confirm the match.

In simple terms, the use of this technological breakthrough

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provides law enforcement the capability to examine and link evidence found at firearms-related crime scenes, which is now time and cost prohibitive for humans to perform manually.

More specifically, if you were to examine any major metropolitan city in the United States today, you would find departments tasked with investigating literally thousands of shooting incidents a year involving gang-related drive-by shootings, armed robberies and drug-related homicides, just to name a few. In the cities of New York and Chicago alone, each police department seizes over 20,000 firearms each year.

ATF is currently evaluating the technology and application of this system for nationwide deployment. Our first onsite testing started with the Washington, DC, Metropolitan Police in January of this year. The system is proving itself in the solution of criminal cases. In one investigation alone, the system connected eight homicides believed committed by a narcotics operation in the District.

The system's projectile comparison capability has made, to date, several matches of shooting incidents and/or recovered firearms. Some of the first matches that were made linked together the shootings of four homicide victims and one intimidation shooting. The target of the investigation was later killed and is one of the four homicide victims.

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As a result of these four shootings, ATF worked with the Metropolitan Police Department and brought together all the investigators to investigate these crimes. That investigation, to date, has identified a total of eight homicides believed to have been committed by a narcotics network operating in Washington, DC. These homicides have been connected through the use of our ballistic comparison system and other traditional means of investigation. Through ballistic examinations, interviews, use of the grand jury, and informants, investigators have identified 11 subjects suspected of these crimes. To date, three suspects have been arrested for homicides, one straw purchaser of a firearm used in a homicide was arrested for federal firearms laws violations, numerous search warrants were executed, and an ongoing grand jury investigation is being conducted.

The CEASEFIRE strategy draws upon ATF's expertise in the investigation of Federal firearms violations. ATF special agents, assigned to field offices across the country, are provided with the training and equipment necessary to conduct the most complete and difficult investigations. In addition, forensic laboratory personnel support these special agents by conducting toolmark examinations, serial number restoration, and link recovered projectile and cartridge cases. Also,

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firearms experts provide technical support in the identification of firearms.

In order to make effective and proficient use of technological advances, law enforcement must link technology with crime fighting endeavors. The major benefit and crux of the CEASEFIRE strategy is its ability to interconnect investigative resources involving firearms-related crimes for direct accessibility by Federal, State, local, and international law enforcement agencies. If the law enforcement community, most importantly at the State and local level, is to have a meaningful impact upon the violent crime problem, it is essential that successful partnerships are established.

In regard to caseless ammunition, caseless ammunition or combustible case ammunition is not new technology. The concept was developed during World War II.

True caseless ammunition utilizes propellant bonded directly to the base of the projectile. Combustible case ammunition uses a cartridge case molded from a propellant type material.

This cartridge case is then filled with an additional propellant.

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In both, true caseless ammunition and combustible case ammunition, there is no cartridge case ejected from the weapon after firing. The propellant and/or combustible case is completely burned during the firing of the weapon.

Combustible case ammunition has seen extremely limited use in commercially available small arms over the last several decades. At the present time, only one such firearm, capable of firing combustible case ammunition, is commercially marketed in the United States.

The lack of commercial success of caseless/combustible cartridge case ammunition is due to the fact that the ammunition is considerably more expensive than conventional ammunition, and combustible case ammunition is not compatible with a firearm designed for conventional metallic cartridge cases.

A firearm intended for use with caseless/combustible case ammunition must be specifically designed for this type of ammunition, and the weapon requires a more complex breech sealing mechanism than a conventional firearm.

In closing, I must add that throughout this century, law enforcement has enhanced its ability to solve crimes by

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utilizing various scientific and innovative investigative techniques. During the 20th century, criminal justice advancements have paralleled the Nation's scientific progressions. For example, call box communication was replaced by handheld single unit radios with direct access to patrol personnel; handwritten card files that filled rooms are now contained on computer disks that provide instant retrieval and storage; manual fingerprint identification that took days or weeks has become fully automated and now can be queried in minutes; and as previously mentioned, ballistic comparison has been modernized through the use of a laser and computer imaging system, greatly accelerating examinations.

The CEASEFIRE strategy was designed to incorporate technological advances with various skilled human resources in a concerted effort to reduce firearms-related crimes. Law enforcement should grasp the reality of this concept and follow it into the 21st century in order to effectively address the crime problems of the future.

At this time, we would like to present to you an actual demonstration of the Integrated Ballistics Identification System. Upon completion of the demonstration, I'll be happy to take any questions you may have.

ID:

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5:33 No.002 P.19

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TO

96228873 P.18

-18-

Thank you for the opportunity to express our views to you on
this very significant issue.

**EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET
Washington, D.C. 20503**

July 18, 1994

LEGISLATIVE REFERRAL MEMORANDUM

LRM #M-1659

TO: Legislative Liaison Officer -

**TREASURY - Richard S. Carro - (202)622-1146 - 228
ONDCP - Babette Hankey - (202)395-6739 - 257**

**FROM: JAMES J. JUKES (for) *Ji*
Assistant Director for Legislative Reference**

**OMB CONTACT: RONALD JONES (395-3386)
Secretary's line (for simple responses): 395-3454**

**SUBJECT: JUSTICE Proposed Testimony on Developments in
Firearms Technology (*TWO PIECES*)**

DEADLINE: 4:00 PM July 19, 1994

**COMMENTS: This testimony is for a hearing on firearms
technology on Thursday, July 21. Treasury is also testifying.**

OMB requests the views of your agency on the above subject before
advising on its relationship to the program of the President, in
accordance with OMB Circular A-19.

**Please advise us if this item will affect direct spending or
receipts for purposes of the the "Pay-As-You-Go" provisions of
Title XIII of the Omnibus Budget Reconciliation Act of 1990.**

CC:

**C. Brown
M. Schwartz
Tim Fain
J. Cerda**

You may also respond by (1) calling the analyst/attorney's direct line (you will be connected to voice mail if the analyst does not answer); (2) sending us a memo or letter; or (3) if you are an OASIS user in the Executive Office of the President, sending an E-mail message. Please include the LRM number shown above, and the subject shown below.

FROM: _____ (Date)
 _____ (Name)
 _____ (Agency)
 _____ (Telephone)

The following is the response of our agency to your request for views on the above-captioned subject:

_____ Concur

_____ No objection

_____ No comment

_____ See proposed edits on pages _____

_____ Other: _____

_____ FAX RETURN of _____ pages, attached to this
response sheet



Department of Justice

STATEMENT

OF

**DAVID G. BOYD
DIRECTOR OF SCIENCE AND TECHNOLOGY
NATIONAL INSTITUTE OF JUSTICE**

BEFORE

THE

**SUBCOMMITTEE ON CRIME AND CRIMINAL JUSTICE
COMMITTEE ON THE JUDICIARY
U.S. HOUSE OF REPRESENTATIVES**

CONCERNING

DEVELOPMENTS IN FIREARMS TECHNOLOGY

ON

JULY 21, 1994

Mister Chairman, Members of the Subcommittee:

Every year, more than 23,000 people - nearly half the total number killed in the entire Vietnam War - are murdered. More than 170,000 are raped, and more than 6 million are victims of assaults. At least thirteen million are victimized by property crimes while about 1.5 million victims of violent crime are treated by our health care systems. The total economic cost of crime in this country - in a single year - comes to a staggering \$70 billion!¹

It should come as no surprise then that the American public consistently ranks crime at the top of every list of serious threats facing the country.

Since 1988, investment in law enforcement and the criminal justice system has grown at roughly twice the rate of all other government spending, until as a nation, we now spend more than \$75 billion each year on the law enforcement and criminal justice systems.² At the same time, we spend another \$50 billion on private security agencies and untold amounts on often unsuccessful efforts to protect our homes and businesses.³

Yet, despite the incredible cost of law enforcement and the clear expressions of concern by citizens about the consequences to the public of crime, we have done little to modernize our primary crime-fighting instrument -- the nation's police. In fact, state and local police, who represent more than 95% of our nation's police personnel and handle well over 95% of the crime in this country, are still equipped much as was Wyatt Earp in the late 19th century.

Surely, America's highly sophisticated technology base can provide better alternatives and make our thin blue line more effective at the same time.

If we could reduce crime by only one percent, it would mean 230 fewer murders, more than 1,700 fewer rapes, 60,000 fewer assaults and at least 130,000 fewer property crimes. It would mean 15,000 fewer victims of crime burdening our already hard pressed health care systems, and it would mean a savings of at least \$700 million in economic costs -- savings that would be realized every year.

If we had available technologies which eliminated the need for high speed pursuits, what could it save our cities? New York City recently lost a judgment for injuries to an innocent child (struck by a motorcyclist being pursued by police) for over \$100 million -- more than 50 times the total annual research and development budget allocated to the National Institute of Justice for the development of technologies to address this very issue! Last year in California alone, there were more than 7,000 high speed pursuits, which resulted in more than 1,200 injuries. ~~On 10/15/84, the statistics~~

~~were for innocent bystanders, while 14 were in law enforcement~~

~~officers. Nationally, about 1% of high speed chases end in~~

~~fatality.~~⁴

If we could find a technology that would safely and effectively permit an alternative to incarceration for only 1% of our current prison population, it would save at least \$159 million

each year.⁵

If we had available tools to reduce the consequences of violence in confrontations between police and suspects, what could they save us? We have no certain way of knowing, but we do know that without them, nearly 300 suspects will be killed each year, despite the best efforts of police to avoid bloodshed, and more than 150 police officers will die in the line of duty.⁶

While there may be limits to the amount of improvement technology is capable of producing in the levels of crime, the promise of productivity improvements offered by technology is clear, the numbers are equally impressive and the need compelling. From 1970 to 1991, crimes per police officer increased more than 65%, a workload increase that is reflected in the rate at which crimes are now cleared.⁷ In 1991, only 21% of all reported property crimes - barely one fifth - were cleared within one year. While the numbers are better for violent crimes, they still aren't very promising: only 45% -- less than half -- of all violent crimes are cleared each year. ~~Since there are limits to the resources we can~~
~~apply to law enforcement, finding new, more effective ways to~~
~~improve~~ the productivity and effectiveness of policing is essential.

Unfortunately, our efforts to leverage technology to obtain those productivity improvements have hardly been reassuring. From 1985 to 1990, ~~that~~ Federal research and development investment increased 7.8% in inflation adjusted dollars. During the same period, crime

increased 31.4% while the number of criminals incarcerated rose by 60%. ~~At the same time, investment in research and development for~~

~~the law enforcement and criminal justice system has been~~

~~steadily declining~~, as the problem got worse, we invested even less in building better tools and finding solutions.

Part of the problem is a perception that law enforcement already has access to advanced technologies. Because federal agencies have access to advanced technologies, we tend to assume the same tools are available at the local level. At the same time, television programs often suggest that police have lots of fancy technology they can deploy at appropriate times. Unfortunately, most of this equipment is unavailable to local law enforcement or is far less sophisticated or effective than portrayed. Even that technology which really exists is rarely available to any but the largest departments, and then is usually drawn from military equipment only marginally suited for law enforcement uses. Most technology in state or local law enforcement agencies is hand-me-down, generations old, technologically obsolescent military equipment (night vision devices, radio systems, etc.). And most of the technology developed for federal agencies is either classified, is concentrated primarily on automation or surveillance technologies, ~~not available only in very small quantities~~. Very little has been developed with the patrol officer in mind.

In most state and local law enforcement agencies, the research and development operation - when there is one - is someone charged

with going through equipment catalogs to find modern, affordable equipment. Even among federal agencies, those offices referred to as research and development are almost entirely applications oriented activities, building or adapting one-of-a-kind surveillance devices tailored to the specific operational requirements of a single agency. What is missing is a genuine research and development effort focused specifically on law enforcement, corrections and public safety needs, ~~especially in the~~ ~~state and local level~~. Such an effort is needed because military technologies, while well suited to reactive strategies, usually require significant adaptation to be made suitable for the kind of crime prevention strategies we want to see put in place.

Law enforcement research and development projects tend to be very small and progress very slow.⁸ At the national laboratories, where much of the work is being done, law enforcement projects are part time work, sandwiched in among the major, multimillion dollar projects. As a consequence, it is difficult to attract high-powered talent and it is even harder to develop the critical mass required to make significant breakthroughs. At the same time, the market is extraordinarily fragmented. More than 90% of the roughly 17,360 law enforcement agencies in the united states employ 30 or fewer sworn officers and most departments make all purchases independently.

This fragmentation discourages the entry of major industry into the field, yet the potential market is very large. Police and Sheriffs' departments collectively employ nearly 840,000, while

corrections agencies employ approximately 400,000. The private security industry is the real heavyweight in terms of employment, with more than 1.5 million, while fire and rescue agencies - which could use much of the technology needed by law enforcement - account for another 340,000 employees. These numbers are large enough to support vibrant markets, but - unfortunately - are not large enough to support much research and development overhead.' That's what the Attorney General meant when she pointed out that "we've discovered that industry is finding that doing business successfully with law enforcement, with thousands of different agencies, is much different and much more difficult than dealing with the Department of Defense and its single set of procurement regulations. At the same time, we know it is difficult for individual law enforcement agencies to find the information they need to help them locate and purchase new technologies. The National Institute of Justice is helping resolve these issues by initiating a Technology Center which will be part of a new law enforcement information network that will make it easier for law enforcement to find useful products and assist industry in identifying law enforcement requirements."¹⁰

Why do we dwell on these numbers? Because supporting the smaller agencies - over 90% of all our law enforcement agencies - is the crucial challenge. The truth is that 95% of all law enforcement manpower is state and local and the vast bulk of what

we consider policing falls within local jurisdictions. Federal agencies are rarely the first on the scene for those problems the average citizen is most concerned about - domestic disturbances, assaults, murders, gang brawls, drive-by shootings, burglaries, carjackings, robberies and the like. While federal agencies are involved in a dozen or so hostage/barricade or barricade operations each year, the New York City police alone are called out to confront this kind of problem several hundred times each year! The corrections picture is not much different. Over 90% of prison inmates - and all jail inmates - are held in state and local facilities.¹¹ In fact, the largest federal facilities - which rarely house more than 2,000 prisoners are dwarfed by the Los Angeles County Jail which houses over 20,000! If we want to have an impact on crime, we'll have to support law enforcement at the state and local level by helping to provide technological "force multipliers". That's why most of the Attorney General's interests and this administration's anticrime initiatives have to do with strengthening state and local law enforcement, ~~and that is what~~

~~promoted the Vice President to define this past year as a~~
~~high time that we put the most advanced technology and the best~~
~~new approaches at the disposal of police officers and other law~~
~~enforcement officers throughout this country.~~

There obviously is no one-to-one relationship between investments in technology and reductions in crime or improvements in police

productivity. But law enforcement is probably the one area where the greatest gains from technology can be realized - not because law enforcement is particularly responsive to technology, but because so little has been invested in bringing technology to state and local law enforcement. Examples of what can be accomplished with limited resources and accurate identification of law enforcement requirements include:

~~The introduction of S&P body armor by the S&P~~

~~institute of justice. This technology, developed by~~

~~the S&P body armor, S&P armor, S&P armor, S&P armor~~

~~the S&P body armor, S&P armor, S&P armor, S&P armor~~ lives at an estimated savings in survivor's benefits and replacement costs of more than \$1 million per officer saved (for a total of more than \$1.6 billion), and resulted in the creation of an international industry dominated by the United States¹²;

A revolutionary new fingerprinting device which was conceived, developed, tested, transferred to industry and commercialized in barely 18 months with a research and development investment of less than \$100,000;

An automated booking system implemented recently by the Drug Enforcement Administration ~~is capable of reducing~~ booking time from 75 to 15 minutes - a savings of 80% for that single function;

The development of standard reference materials for DNA

identification, a project which was recognized by Research and Development Magazine as one of the 100 best research and development projects of 1993; and

- The development of standards material for polymerase chain reaction -- a newer, faster and cheaper method of DNA identification -- which will soon be ready for field use.

At the same time, intelligent planning for major federal systems and extensive cooperation among state and federal law enforcement has also resulted in major technology payoffs for state and local government, including:

The recently completed FBI Engineering Research Facility, which provides a superb capability for the development, custom modification and operational testing of high technology equipment; and

- The National Crime Information Center (NCIC), which currently handles over one million transactions per day for federal, state and local law enforcement agencies.

Paradoxically, it is in law enforcement - probably the most poorly funded area of research and development - that technology transfer is the most promising and can probably pay the greatest and most immediate dividends. The potential for payoffs in technology - at the patrol officer level - are nearly unlimited. Is it, for example, possible for technology to make stolen weapons unusable or prevent the deaths each year of hundreds of children in

firearms accidents?¹³ Representative of incidents in which police officers are killed with their own weapons was a bizarre gun battle last month in a crowded hospital clinic in Brooklyn, New York. Two corrections officers had taken a prison inmate to the clinic for treatment. When restraints were removed so the prisoner could be treated, he snatched one of the guard's revolvers and critically wounded the other guard. As the prisoner raced away, he grabbed a 7-year old boy. Edna Grajales, the corrections officer whose weapon was taken, then grabbed her partner's gun, pursued and killed the prisoner. A smart gun would have saved a life, prevented an officer from being critically wounded, and saved a young mother and child from a traumatic experience.

Can we find better ways of tracking suspects? Can we tell what is in a fleeing felon's car, or in a suspect's house? Can we find a face or an armed subject in a crowd? Can we detect an armed student or other persons entering a school? Can we produce small, easy-to-use, inexpensive explosive sniffers or chemical detection equipment? Can we, without injury to the suspect, any hostage or innocent bystanders, subdue a suspect in a hostage/barricade situation or domestic disturbance; a fleeing vehicle or on foot¹⁴; a one-on-one confrontation with an armed but deranged subject; a carjacking; or a resisted search or drug raid? Can we develop safer methods of extracting an uncooperative prisoner from his cell?¹⁵ Can we provide safer, more effective and socially acceptable ways to control unruly crowds or quell riots? Can we provide better, more

sophisticated training for law enforcement personnel at all levels, from officer to chief?

In contrast with the Department of Defense, there is no federal level agency driving the development, manufacture or acquisition of specialized law enforcement equipment. In fact, law enforcement equipment purchases are made by the members of an intensely fragmented market. As a consequence, this market - with nearly 3 million potential individual customers - is large enough to sustain an industry, but too small to support the research and development base needed to create the new products it needs.¹⁶ In fact, there are virtually no products developed exclusively for law enforcement use (with the possible exception of ~~batons, handcuffs and~~ batons).¹⁷

Until recently, the role of the National Institute of Justice has been primarily one of funding the development of promising technologies in a few key areas. Only in the past three years has it also become one of identifying existing technologies (especially in the Defense and Intelligence communities), encouraging promising new concepts and facilitating the transfer of already developed technologies to law enforcement use.

By late 1992 and early 1993 a series of grants, cooperative agreements and interagency agreements had been initiated by NIJ in an effort to form a broad based technology identification, development and transfer program which has focused from the beginning on the practical needs of the user community. State and

local law enforcement, as well as corrections departments and other users have been and continue to be included as the essential components of the NIJ technology team. To ensure that policy and human factors issues are properly addressed in the collection and analysis of background data on use of force by law enforcement personnel, and to ensure that these issues are properly represented in considering technology development for law enforcement, social scientists and criminal justice researchers are also included as part of the NIJ ~~technology~~ team.

Since funding for the development of technologies for law enforcement is severely limited, NIJ ~~is~~ working to leverage research and development efforts by industry and other federal agencies. To start the search for new technologies NIJ turned to the vast technical expertise that exists within the Department of Energy National Laboratories, particularly in the special technologies programs at the facilities charged with development of technology for intelligence gathering and the safeguarding of nuclear materials. At the same time, NIJ began aggressive efforts to identify military and intelligence community technologies that may be candidates for dual use under the Administration's Defense Technology Reinvestment Initiative announced early in 1993.

Spearheading the effort is a distinguished panel established under a National Institute of Justice cooperative agreement which has been charged with establishing links essential to identifying

and transferring dual use technologies. Directed by Vice Admiral (retired) E.A. Burkhalter, Jr., the panel includes Judge William Webster, former Director of the FBI and CIA; Dr. Ruth Davis, former Assistant Secretary of Energy; General (retired) Paul Gorman; Mayor Kurt Schmoke of Baltimore; Jim Falk, former White House Counsel; Ray Havens, Deputy Director of the U.S. Marshal's Service; and a number of active federal officials from the Department of Defense, Intelligence Community Management Staff, and the Department of Justice.

Tying it all together is the Technology Assessment Program Advisory Council (TAPAC), funded by a cooperative agreement from NIJ and chaired by Chief Harlin McEwen of Ithaca, New York. This council is made up of more than 80 senior state, local and federal law enforcement officials from the United States and Canada. TAPAC reviews technology efforts on behalf of law enforcement to ensure they are well grounded in the very real world of the police officer.

At the same time, through existing grants and cooperative agreements, we have started a major effort to identify what it will take to get new technologies introduced to the community by creating two other groups: a liability task group and a community acceptance panel.

The Liability Task Group is constituted of private, municipal and law enforcement attorneys, retired judges, and law school faculty and students. This task force is charged with identifying

liability issues and recommending efforts law enforcement agencies should undertake to address them, both before and after new technologies are introduced.

The Community Acceptance Panel is key to getting any technology into the field. It is made up of a wide range of community groups and is charged with helping to identify "show stopper" community issues that might surround a newly developed or developing technology. Included in this panel are representatives from the ACLU, NAACP, Handgun Control International, the League of Women Voters, the National Rifle Association, police review boards, academicians, a police chief and other interested community groups.

Although the NIJ technology transfer program, initiated by the Attorney General's letters to the Secretary of Defense and Director of Central Intelligence, is ~~about~~ a year old,¹⁸ it has already produced:

- A prototype rear seat airbag to safely restrain uncooperative prisoners in the back seats of police cars which we believe it will be possible to manufacture and sell at a cost no greater than that of the best current restraint seat;

- A prototype barrier strip which can deflate tires safely and which we expect will sell at about one quarter of the cost of current strips, while offering more capability and substantially greater safety than existing methods.

- A breadboard velocity-adjusting weapon which will allow rubber bullets or other safe projectiles to be fired without causing injury at any distance;
- The development of teams at each of the five national laboratories involved in NIJ projects, made up of scientists, local police and corrections officials and social scientists working to develop practical and affordable less than lethal technologies.
- At the request of the law enforcement community and with the assistance of the Southern California Chapter of the American Civil Liberties Union, ~~the~~ comprehensive studies of the safety and effectiveness of the pepper spray that is increasingly being used by law enforcement. As a byproduct of this effort, which was completed only recently, we have identified positional asphyxia as the cause of an estimated 80% of all in-custody deaths and - with the assistance of the International Association of Chiefs of Police - have provided Police and Sheriffs departments with information on how to prevent positional asphyxia deaths.

In addition, the National Institute of Justice has initiated projects to:

- Develop a weapon that can be fired only by its owner to protect police officers and make handguns in the home

safer. In the last 10 years, at least one in seven officers killed with a firearm has been killed with his own gun, while hundreds of children are killed accidentally each year with improperly secured weapons; [REDACTED]

- Develop safe ways to stop cars in certain situations;
- Develop disorienting or dazzling light systems with protective eyewear for police;
- Identify anesthetic compounds with very high safety margins and develop effective ways to simultaneously deliver both the compounds and the antidotes to dramatically increase safety;
- Develop synthetic compounds that can be used to identify fingerprints on particularly difficult surfaces;
- Insure the efficiency of DNA identification by developing massively parallel electrophoresis to provide tools to allow the rapid processing of large numbers of samples;
- Develop better technologies for the identification of trace evidence;
- Put key reference materials developed by the National Institute of Justice and essential to crime laboratories and investigative agencies on digital media, such as CD ROMs;
- Develop, publish and - in some cases - administer standards for key law enforcement equipment such as soft body armor,

DNA identification technologies, handguns, handcuffs, police car packages and other equipment; and

- Publish materials to provide law enforcement agencies information on new technologies.

Shortly after the Attorney General wrote to the Secretary of Defense in June, 1993, asking for assistance in identifying technologies - both less than lethal and general technologies - with potential for declassification and transfer to or dual use by law enforcement, representatives of the National Institute of Justice met with representatives of the Office of the Director of Defense Research and Engineering. Early in December, the Advanced Research Projects Agency ~~provided a list of technologies being considered for development as part of an operations other than war program and asked us to identify law enforcement agencies on that list which they could consider integrating into the AWR research and development plan. We took the list to our technology transfer advisory council and developed a list which~~

First, a device capable of identifying handguns, which has much greater discriminating power than existing metal detectors. Probable cause rules require that we know with a high level of certainty that a subject is carrying a gun - not just a piece of metal that might be a gun. This device is needed in three configurations: one capable of being placed unobtrusively in school entrances; one

capable of being mounted in and operated from a vehicle; and a handheld or portable version that can be placed in high-interest locations.

- Second, the whole range of less than lethal technologies, but especially technologies capable of stopping cars safely; and
- Third, a version of the personnel status monitor and remote surgical system being considered for development for use by military medical personnel which, ~~adapted for law enforcement~~, would greatly strengthen the ability of officers on foot to work in a genuine community policing role, permit supervisors to observe and assist as needed, and provide warning if an officer is in trouble (as well as information on where he or she is). The vital signs and locator monitors could also be used to provide far more robust and potentially less expensive electronic incarceration systems, while the vital signs monitor could help alert officers when a prisoner in custody is experiencing life-threatening physical problems. ~~See~~

~~recently initiated steps to join with the Department of Defense in this project. Defense will invest about \$1 million; NIA plans to invest \$200,000.~~

On March 22, 1994, the Research and Technology Subcommittee of the House Armed Services Committee convened hearings to examine our progress in implementing an effective partnership with the

Department of Defense. One month later, Vice President Al Gore brought together Attorney General Janet Reno, Secretary of the Treasury Lloyd Bentsen, and Deputy Secretary of Defense John Deutch to see several advanced technologies developed for law enforcement use and to sign two major Memoranda of Understanding. One was between Justice and Treasury and establishes a new Federal Law Enforcement Wireless Users Group to tackle electronic communications and data transfer interoperability problems among federal law enforcement agencies. The other - between Defense and Justice - established a new Joint Program Steering Group to be manned jointly by Defense and Justice Department personnel. This group will help to identify, develop and transfer to law enforcement useful defense technologies.

It may also be that our law enforcement experience can help build better tools for military use in peacekeeping operations, especially as peacekeeping operations increasingly resemble law enforcement. As we develop solutions, our considerable experience with the difficult issues that the military is increasingly encountering may help strengthen their capabilities.

But while we share many needs, we have to remain conscious of the very real differences. As the Attorney General told her military audience:

"Let me emphasize some differences that, coming from a Defense background, you may not be used to, but which are critical to understanding how you can help law enforcement.

"Your standard for nonlethal technologies is generally one of minimizing collateral damage; our standard is the elimination of any collateral damage.

"When less than lethal technologies are used by law enforcement, remember that they're not being used against an enemy; they're being used to help protect fellow Citizens. When police use these devices, they must be constrained by the knowledge that the people they are restraining aren't enemies; they are fellow citizens, with a full set of civil rights.

"In the military, the mission comes first, even if it means sometimes sacrificing the safety of bystanders. For the officer, it is the safety of those bystanders that is paramount."¹⁹

~~While our relationship with the Department of Defense is important~~
~~because it~~ provides, for the first time, a formal law enforcement voice in the federal research and development apparatus, ~~it is~~
~~limited to those technologies which meet defense needs first.~~ More than a seat on a single working group is needed if we are to succeed in leapfrogging U.S. Law enforcement from a dependence on weapons available in Wyatt Earp's time into the 21st century. There are at least six major elements that should be undertaken to ensure that programs to transfer technology to law enforcement are more effective and more lasting than past efforts.

First, we will have to draw attention to the advantages technology can offer to law enforcement, because - while virtually

no money has been invested in developing effective technologies specifically for law enforcement, it is also true that law enforcement has not readily embraced technology. Instead, ~~the~~ budget increases have almost invariably been committed not to tools to make the department more efficient, but to additional manpower. The result is that 97% or more of law enforcement budgets are invested in manpower. While there is no substitute for an officer on the beat, public budgets are simply too tight to allow us the luxury of expanding our police departments indefinitely. Technology offers the only viable solution.

For example, the 80% savings realized by the drug enforcement administration's automated booking system translates into an hour saved for every booking operation. At that rate, every 1700 bookings would be roughly equal to one full man year of savings. In new york city alone, savings on that scale would mean - with nearly 250,000 arrests annually - a savings equivalent to putting an additional 147 officers on the streets. Nationally, it could mean the equivalent of more than 8,500 officers.²⁰ And, fully implemented, the system would allow better records, better support to prosecutors, and fewer mistakes. More importantly, with a moderate level of national emphasis ~~and implementation of the~~ ~~administration's National Information Architecture~~, it could provide for a standardized booking system which could - in turn -

prevent an arresting jurisdiction from releasing a suspect they were unaware was wanted by another agency in another state. Other technologies offer at least as much promise, if only we are willing to take advantage of them. We're going to realize those savings at the federal level because steps are being taken to expand the system to support the U.S. Marshal's service and the border patrol.

Yet, ironically, this new system typifies some of the largest shortcomings in the way we support state and local law enforcement. There are, currently, several proposals before Congress which aim at improving the automation capabilities of state and local agencies. Unfortunately, there are no provisions in any of those bills to require that equipment funded by the federal government complies with standards designed to ensure compatibility of those systems with national systems currently being developed. Unless we establish requirements to ensure that compatibility we may - with the best of intentions - wind up repeating the mistakes of past years by providing equipment which may be made obsolete even as we fund its purchase, thus delaying further our ability to establish the sort of networks we will need to most efficiently catch criminals or perform background checks.

Second, we need to identify a principal focus for law enforcement technology efforts, to coordinate the development of new technologies, eliminate duplication and ensure law enforcement involvement so we avoid the costly mistakes made too often in other

federal research and development efforts.

One of our major concerns is in husbanding our limited resources by ensuring we don't waste money in duplicative efforts. About a year ago, when we first started to inventory what was in the field and what was being developed, we stumbled across several cases where different agencies were working on the same problem, but didn't know about each other. Determined to fix that problem, the Attorney General directed NIJ to ~~develop a mechanism~~ to ensure that we were sharing information about what we were doing. That way, we could jointly identify the most promising projects and concentrate resources on them, rather than conducting lots of little efforts to solve the same problems. Doing this allows us to capitalize on successes already made. But we can do that only if we rely on intelligently structured partnerships which allow us to share information and pool resources.

While both the military and law enforcement need many of the same technologies, the differences in the structure of these two communities, coupled with tightly constrained budgets at the state and local levels have forced us to follow a somewhat different requirements and development process than the military is used to. We didn't even have a clear idea what technology was already in the field, so we had to start with a series of surveys. Then we relied on the various program activities previously mentioned, as well as seminars, conferences, and workshops to develop a list of what law

enforcement thinks it needs, and began exposing the law enforcement community to some of the technologies available in the military and intelligence communities on the theory that no one ever had a requirement for a telephone until he knew what a telephone was. Then we reassessed what they needed and began crawling through the federal research and development agencies and meeting with industry. We will continue this process as we expand our understanding of law enforcement requirements and of the potential of technologies already developed.

Third, we need to create a mechanism to ease access to technological information by public safety agencies. One particularly efficient way to do this is through the technology center mentioned by the Attorney General. Such a center would be able to consolidate information and provide it to law enforcement. For most law enforcement agencies, it is very costly to devote an officer's precious time to finding technology-related information, and is even more difficult to locate specialized technologies to meet key needs. The technology center can:

- Build on existing information networks and services by providing a gateway to law enforcement technical information so agencies can get answers with a single telephone call. The center can answer many questions directly, but can also maintain lists of key sources and points of contact that agencies could be referred to for

further information. Such a capability can add to the usefulness of existing services, such as the Regional Information Sharing System (RISS) and the FBI Engineering Research Laboratory in Quantico, and greatly increase access to technical information for smaller law enforcement agencies;

Maintain consumer information for law enforcement equipment. Since testing of all law enforcement equipment by each local police department is far too expensive to be practical, the center can maintain lists of equipment purchased by agencies throughout the United States. Agencies calling about specific products can then be referred to departments with actual experience with the product. There is no current source of such information for law enforcement.

Increase the usefulness of very high cost/low use equipment. Extraordinarily capable high technology equipment with potential applications in law enforcement exists in a number of places, but access to the equipment - or even knowledge of its existence - is rare. Where feasible, the center can help coordinate the use of some of that equipment and greatly enhance its value to the taxpayer.

Develop a mechanism for the gathering of information on

what technologies law enforcement and corrections agencies actually need so they can be passed on to scientists and industry. Historically, the identification of law enforcement "needs" has been a task undertaken without law enforcement input. More often than not, one or more technologists - often with the sketchiest understanding of law enforcement operations - have simply assembled lists of interesting technologies which have been too expensive, too complicated, and too unrelated to the realities of law enforcement, and especially to the liability problems posed by new technologies.

NIJ is working now to find innovative - and affordable - ways to expand the responsibilities of the existing Technology Assessment Program Information Center (TAPIC) so it can undertake these tasks.

Fourth, we should build on the emerging DOD/DOJ Joint Steering Group to establish a way to insure public safety needs are always taken into account in the earliest stages of every federal research and development effort. For example, the U.S. Army is currently developing simulation technologies which will allow the creation of inexpensive platforms for training individuals. The Army National Guard, for example, has a critical requirement for simulators for training since they lack the training space and equipment available to active units. If new simulators are designed from the beginning

to include public safety training requirements, then every national guard armory with the equipment will also have available a trainer useful for local police, fire, and rescue departments, and - instead of being useful one weekend a month - the equipment can be useful nearly every day.

And it's not just the Army that has capabilities that can be used to support law enforcement. Naval In-Service Engineering - East (NISE-E) in South Carolina has available to it a modern brig which could provide an ideal platform for testing technologies suitable for use in corrections facilities. We are currently exploring opportunities for joint projects with that center.

There is probably no single area where a partnership between Defense and law enforcement can pay dividends as great as those that are possible through the joint development of simulation technologies.

Fifth, it is essential that we establish a process to ensure the safety of law enforcement technologies, both for the public and the officer. There is no current mechanism in the United States for the systematic monitoring of the safety of newly introduced law enforcement equipment. Pepper spray, for example, became the most widely used less than lethal technology in the United States over a period of barely three years. At the same time, it became so popular among private citizens seeking self-defense alternatives to handguns that we estimate 90% of all pepper spray sold in the

united states is sold to private citizens. Yet all this happened without the benefit of a single, comprehensive safety study! It was only in June, 1993 that a series of scientific studies were undertaken by NIJ to determine whether pepper spray was as effective as claimed and as safe as a law enforcement technology should be. We initiated a major study with the Baltimore County Police Department and began an intensive effort to collect data on any fatalities which occurred during incidents in which pepper spray was used. We are continuing those efforts, but have already begun to provide law enforcement and the public essential safety information in the form of user guides and medical reports, and are using pepper spray as a model for the development of a mechanism for monitoring the safety of other technologies employed by law enforcement.

And finally, we must address the fragmented buying power of law enforcement. With the possible exception of communications equipment vendors, the fragmentation of the market makes it difficult to interest companies large enough to bring the advantages of economies of scale to law enforcement markets. The result is that local agencies are sometimes the victims of less than competent and sometimes even unscrupulous producers and vendors. There is, for example, no manufacturer that builds a car designed specifically for police. We have specially designed postal and ups trucks, but police departments lack the concentrated buying

power to interest manufacturers in producing specially designed cars for police. In fact, police buying power is so limited that the police were unsuccessful even in persuading manufacturers to seek a waiver from the national highway traffic safety administration which would allow them to produce cars without the passenger side airbag for police. The right side airbag is forcing many agencies to completely re-engineer the placement of police equipment in their cars.²¹ a buying consortium would not only ensure a market attractive to law enforcement, but could also dramatically reduce the prices of most law enforcement equipment. Properly developed, such a consortium could promote competition among suppliers by developing the equivalent of a GSA catalog for suitable equipment. Critical to the success of such a mechanism, however, would be the direct and detailed involvement of law enforcement at every level, from local to federal, to insure that decisions were driven by real needs and that products were acceptable to the officers who have to use them.

We know Technology can't fix every shortcoming. We know it can't make up for poor judgment or compensate for inadequate or nonexistent training. It can't fix the problems that result from poor officer screening or selection and it can never replace competent leadership. But it can provide tools to increase options, make the police officer's job easier, increase the effectiveness of law enforcement, enhance productivity in law

enforcement by reducing administrative overhead and improving responsiveness, limit the consequences of poor judgment and improve the safety of the police and the public. Technology can save lives.

With the drawdown of defense spending and a greatly enhanced focus on technology transfer by the Defense, Commerce and Energy Departments and the intelligence community to pressing national social needs, we have an extraordinary window of opportunity to leapfrog law enforcement well into the 21st century. More cops on the beat along with community policing are essential elements of any effective strategy, but equally important is the development of new technologies that will provide law enforcement officers with tools that will allow them to meet the complex challenges of daily policing in a safe and effective manner. Our partnership with the Defense Department is a first crucial step in addressing the shortfalls in investment in law enforcement research and development.

I would be pleased to answer any questions the subcommittee may have.

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2. Justice Expenditure and Employment, 1990, Bureau of Justice Statistics, U.S. Department of Justice. Business Week and U.S. News and World Report articles published in the last few months put the costs, both direct and indirect, from 20% to 100% higher.
3. Private Security: Patterns and Trends, National Institute of Justice, U.S. Department of Justice, August, 1991.
4. Geoffrey p. Alpert, "Police Pursuit and the Use of Excessive Force", unpublished, and "Chief Tim Grimmond, "Police Pursuits," Police Chief, July, 1992, pp. 43-47. Studies have produced fatality estimates ranging from about .38% to 3% of pursuits.
5. At the end of 1990, we were holding 883,593 federal and state prisoners at an annual average cost of more than \$18,000 per inmate, exclusive of the cost of the prison itself. Not included are another 444,584 in jails, many for terms greater than six months. Prisoners in 1992, Bureau of Justice Statistics, U.S. Department of Justice, May, 1993.
6. Uniform Crime Reports: Crime in the United States, 1970 through 1991, Federal Bureau of Investigation.

7. The sources for police workload levels and crime clearance rates are the Uniform Crime Reports published annually by the Federal Bureau of Investigation. Under the FBI's Uniform Crime Reports definition, a crime is generally considered cleared when someone is arrested, charged and turned over to the court for prosecution.

8. Few law enforcement technology projects are funded at more than \$200,000 per year.

9. Census of State and Local Law Enforcement Agencies, 1992, Bureau of Justice Statistics, U.S. Department of Justice, July, 1993.

10. The Honorable Janet Reno, Non-lethal Defense Seminar at Johns Hopkins University, November 17, 1993.

11. Prisoners in 1992, Bureau of Statistics, U.S. Department of Justice, May, 1993.

12. Dupont Kevlar™ Survivor's Club

13. Congresswoman Patricia Schroeder inserted committee language in the 1994 Defense Budget Authorization directing the Advanced Research Projects Agency (ARPA), in coordination with the National Institute of Justice, to initiate the development of safe gun. Her interest in the project resulted from a recognition that hundreds of children are killed each year playing with a parent's weapon. At the same time, there are estimates that - over the past 20 years - from one in seven to one in four police officers killed each year with a firearm is killed with his own weapon. This project will

use existing technologies to develop a reliable weapon which can be fired only by its owner.

14. The National Institute of Justice is initiating a project to create a device which will permit police to tag a fleeing car - while it is in motion - so that it can be tracked without a police pursuit.

15. Four corrections officers were seriously injured - one nearly killed - in New Mexico in August, 1993, as they tried to remove an uncooperative prisoner from his cell.

16. Much law enforcement equipment is directly usable in several related areas. The market therefore includes at least 840,000 employees of police agencies, 1.5 million private security employees, 400,000 corrections employees and 340,000 fire department employees. Data is taken from Bureau of Justice Statistics, National Institute of Justice and Bureau of the Census Reports.

17. Even pepper spray is available to law enforcement at affordable prices in large measure because nearly 90% of the product is sold to private citizens for personal protection.

18. In 1989, Congress directed NIJ to develop a prototype less than lethal device. In 1992, responding to major findings from these earlier efforts, NIJ established a more comprehensive, integrated program to develop and deploy several devices to meet a variety of less than lethal requirements. Since the effort to develop this device inevitably resulted in the identification of

other technologies of value to law enforcement, a parallel technology transfer program was also initiated to facilitate the transfer of more general technologies to law enforcement.

19. Reno, november 17, 1993.

20. These calculations are based on only the roughly 10,000 agencies included in the FBI's Uniform Crime Report. There are more than 17,000 agencies nationwide. A single system is capable of 35,040 bookings per year (at 15 minutes per booking), for a potential savings of 20 man years per machine. Even if the machines performed at only one tenth that level, each system would be worth nearly ten times its cost in manpower savings in the first year alone (based on a cost per system of about \$20,000).

21. Car manufacturers produce police car "packages", which are essentially assembly line cars with different paint (if the department can afford it), special lighting packages, beefed up transmissions, suspensions and engines (in some cases), And other accessories. The right side airbag makes mounting radar guns or other equipment on the passenger side of the dash dangerous to the officer driving, even when the right seat is seldom, if ever, used for passengers.

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Statement before the
House Committee on the Judiciary
Subcommittee on Crime and Criminal Justice

July 21, 1994

By

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On a Fall evening in 1992, a Washington, D. C., cab driver was shot and killed in a holdup. Hours later, two men were arrested in Montgomery County, Maryland, after a failed armed carjacking attempt in the Silver Spring Metro station parking lot. Previously, these two cases would have been investigated by police officers reporting to the crime scenes -- and the fact that the same gun was used in both shootings would have gone undetected. Because the crime laboratories serving these two jurisdictions both participate in the FBI's DRUGFIRE program, however, evidence from these cases was linked and the suspects were held responsible for the murder they committed in D.C.

In Baltimore, DRUGFIRE linked a series of four non-fatal shootings in three different police districts, establishing that the same gun was used in all cases. A suspect was identified when a semi-automatic pistol was recovered by police in a traffic stop, and test-fired ammunition was matched by DRUGFIRE.

Last November, in Los Angeles, the carjack killing of an 11-year old boy -- the investigation of which had stalled without a suspect -- was linked by DRUGFIRE to an ambush attack on two L.A. police officers. The suspects in the ambush now have to answer for the murder of a child.

These are just three of the more than 200 linkages that have been established by DRUGFIRE since it was first installed in the Baltimore/Washington area in July 1992. Each time DRUGFIRE links two or more cases that were not otherwise known to be related, another success story like these can be told. Almost every day now, one of the seven crime laboratories serving the Baltimore/Washington area or the eight labs in Southern California, where DRUGFIRE was installed last Fall, uses DRUGFIRE to link two or more shooting incidents, providing police with leads that help focus investigations or identify suspects.

The DRUGFIRE program was initiated in 1989 as part of the FBI's response to the call from the head of the Office of National Drug Control Policy for an emergency action plan to help Washington, D.C.'s police cope with the rising tide of drug-related violence, especially street crimes involving handguns. The name, DRUGFIRE, reflects the FBI's focus on linking firearms evidence from drug-related crimes.

The concepts underlying DRUGFIRE are simple. First, use the experience of the FBI Laboratory's firearms examiners as the foundation for working with state and local crime laboratories to build and operate a computer database network linking serial

shootings and identifying suspects when guns are recovered. Second, make the system so it can automatically compare firearms evidence received in a single crime laboratory, while allowing any lab to quickly compare and exchange investigative data with other law enforcement agencies -- whether across town or across the country. Third, design the system to run on a low-cost computer that states can afford to buy themselves, and provide, free of charge, the software, training and technical support needed for forensic firearms laboratories to operate independently of the FBI. Finally, listen to users to understand how DRUGFIRE is working, and how it can be improved to better support federal, state and local law enforcement.

The FBI believes DRUGFIRE is well-suited to the Administration's initiative to work in partnership with states to fight violent crime by using modern technology to make more efficient use of scarce investigative resources. Having demonstrated the clear success of DRUGFIRE in Baltimore/Washington and Southern California, the FBI can now work with other firearms laboratories throughout the United States to form a national computer network of forensic firearms laboratories.

For our part, the FBI takes responsibility and bears the expense for developing and testing DRUGFIRE in cooperation with the states. We provide DRUGFIRE software to state and local crime laboratories, together with installation, training, user support, and software upgrades, as they are developed. The states buy their own computer equipment to run the DRUGFIRE software, and provide

laboratory space and qualified personnel to operate the system. States also work with us to define and revise, as needed, the standard procedures and conventions needed to ensure that the data for firearms evidence stored in DRUGFIRE are compatible and exchangeable between firearms laboratories, regardless of location. That way, the strengths of both federal and state law enforcement are used to mutual advantage in countering the plague of gun-related street crime.

In addition to the 15 crime laboratories where DRUGFIRE is currently installed in the Baltimore/Washington and Southern California areas, the FBI has committed to installing DRUGFIRE in 28 additional laboratories by the end of Fiscal Year 1995, including Atlanta (1), Chicago (3), Florida (8), Indiana (5), New York (8), and Ohio (3). As a result, by this time next year we plan to have DRUGFIRE installed in over a quarter of the state and local crime laboratories which conduct firearms evidence examinations. Several other states have expressed interest in receiving DRUGFIRE and, as a result, we anticipate that another 30-40 sites will be installed in FY 1996.

The FBI Laboratory does not envision DRUGFIRE becoming a national database that centrally stores investigative information for all firearms cases. Rather, we see DRUGFIRE as a national network of firearms labs, clustered together by state or other regional groupings, which can exchange images and investigative information with adjacent or distant DRUGFIRE clusters. Within the next year, we plan to test this concept in two places (i.e.,

Georgia-Florida and Illinois-Indiana-Ohio) by establishing high-speed, inter-city communication links connecting the hub sites in each state. Data communications between DRUGFIRE clusters will provide the final building block needed to make DRUGFIRE a truly national crime-fighting tool -- allowing the approximately 150 firearms laboratories in the United States to exchange investigative information from firearms-related cases. As a bonus for firearms examiners in state and local crime laboratories, the same computer that runs DRUGFIRE is being adapted to provide an image database -- that is, an illustrated encyclopedia -- of firearms and ammunition exemplars from the FBI Laboratory's Reference Firearms Collection and Standard Ammunition File, both the largest and most comprehensive forensic collections in the world. The images are stored on CD-ROM as a local add-on to the DRUGFIRE workstation. When this expanded capability is available, beginning next year, DRUGFIRE users will have full access to the FBI's world-class reference collections to assist in identifying firearms evidence.

Standards for classifying and exchanging investigative information regarding firearms evidence are the glue holding the DRUGFIRE user community together. The FBI Laboratory works directly with other federal, state and local crime laboratories to establish and maintain standards for most forensic disciplines as part of our mandate -- established in U.S. Title 28, Code of Federal Regulations, Section 0.85(g) -- to provide scientific and technical assistance, free of charge, to all law enforcement

agencies.

The most recent example of the FBI's standards-setting role may be seen in our sponsorship of the Technical Working Group on DNA Analysis Methods which worked with DNA experts from state and local laboratories to issue quality assurance and proficiency testing standards for forensic DNA analysis. The DNA Identification Act, which is part of both the House and Senate versions of the Crime Bill, formally establishes the FBI's standards-setting role for DNA testing. In our management of the DRUGFIRE program, the FBI is playing a similar, parallel role in promulgating national standards for firearms identification, working with all federal, state, and local firearms laboratories as a facilitator in reaching consensus standards for the operation of DRUGFIRE, and the exchange of investigative information between and among law enforcement agencies.

DRUGFIRE exemplifies how the FBI Laboratory, as the only national, full-service crime laboratory, is uniquely positioned to develop new forensic technology that can be put to immediate use by all crime laboratories to help fight the scourge of gun-related violence. The DRUGFIRE program is a major FBI initiative to foster a true partnership with other federal, state and local law enforcement agencies. We are anxious to implement this proven, low-cost capability so that American society can benefit directly from our technical expertise as soon as possible.

July 7, 1994

MEMORANDUM TO JOHN H. GIBBONS AND ALICE RIVLIN

FROM: BRUCE REED

SUBJECT: FY 1996 Research and Development (R&D) Priorities

Thank you very much for the memorandum of May 6, 1994 regarding R&D priorities. There is no question that it is critical to identify and coordinate various initiatives so that guidance may be provided to the agencies as they prepare their FY 1996 budget requests. I feel very strongly, however, that a critical segment has not yet been identified -- the area of law enforcement technology.

This Administration has made the war against crime a top priority and the proposed Crime Bill represents a tremendous opportunity to push crime-fighting technology forward at a Federal level, and also for the Federal agencies to provide guidance and support to states and local entities as they strive to enter the 21st century in law enforcement technology. Attention to this particular area of R&D is critical because the nation is demanding more effective and creative methods to fight crime.

Furthermore, expansion in this area ties into other stated goals such as a healthy citizenry (reduced crime levels means fewer associated health costs) and job creation and economic growth (defense conversion, as well as a coordinated supply of contracts and goods to an ever-growing cottage industry in private security). I would suggest the following priorities be added with the accompanying text.

GOAL 7: LAW ENFORCEMENT TECHNICAL SUPPORT

The National Institute of Justice (NIJ) estimates that of the \$67 billion the federal government spends on research and development only .0007 per cent of those monies goes to assist police work. Yet our police forces are the front lines in the war against crime and the following priorities have been identified to provide them with the technology and tools to do their jobs safely and effectively.

Memorandum of understanding between the Department of Justice and the Department of the Treasury. The MOU established the Federal Law Enforcement Wireless Users Group (FLEWUG) as a joint agency initiative to share information concerning wireless communications issues among federal law

enforcement agencies and to plan, coordinate and implement future shared use wireless telecommunications systems and resources. A nation-wide wireless network will have the following benefits for the government and its citizens:

- ♦ Nationally available police access to fingerprints, mug shots, stolen vehicle files and weapons files. The ability to quickly pass the description of a suspect over a common radio channel can result in quick apprehension and arrest.
- ♦ Improved rapid response by public safety officials to natural disasters and other national emergencies.
- ♦ More efficient use of Spectrum, a valuable network that provides a wide range of commercial and public applications of wireless technologies.

Memorandum of understanding between the Department of Defense and the Department of Justice. The MOU was entered into on April 20, 1994 and is a five-year agreement to jointly develop and share technologies which are necessary for both law enforcement and military operations other than war. Examples of some of these technologies as they pertain to law enforcement technical support are:

- ♦ Inexpensive night vision goggles;
- ♦ Virtual reality training, simulation and mission planning; and
- ♦ Devices that can detect bombs, mines, and weapons.

GOAL 8: ENHANCED DOMESTIC AND PERSONAL SECURITY

The random nature of crime and its escalating level of brutality has led to a rising tide of fear in the neighborhoods, schools and homes of the American people. Technology can help to allay some of these fears. It has been estimated that if crime were to be reduced by just one percent, this would translate to 230 less murders, 1,000 fewer rapes, 17,000 fewer assaults, 14,000 fewer victims of crime requiring health care, and a \$700 million reduction in economic costs. The following are areas that have been identified for additional emphasis.

Memorandum of understanding between the Department of Defense and the Department of Justice. (See reference above). In addition to those items already mentioned, the following are priorities identified under the MOU that pertain to domestic and personal security:

- ♦ Less-than-lethal weapons that use blinding light or sticky foam;

- ♦ "Smart guns" that can only be fired by an authorized user (Hundreds of children die every year playing with their parents' handguns, and one-in-four of the approximately 150 police officers killed each year are murdered with their own weapons, National Journal, April 16, 1994 at 891);

Navigation, surveillance and command systems for use by law enforcement officers. The Office of National Drug Control Policy (ONDCP) through its Counterdrug Technology Assessment Center (CTAC) is developing new technologies to improve law enforcement response time. This will be done by using sophisticated satellite communications and miniaturized global positioning systems to instantly pinpoint remote locations. (Referenced below).

Increased School Security. The Department of Education and CTAC are coordinating efforts to improve school security through better and more sophisticated sensor and surveillance technology.

GOAL 9: DRUG CONTROL TECHNOLOGY

There is no doubt that there is a strong and tragic link between drugs and violent crime. One cannot effectively be combatted without due attention to the other. R&D efforts must address the growing drug culture in this country. The following items have been identified for additional emphasis in FY 1996.

Chemical and biological testing to overcome drug-addiction. CTAC is working with Columbia University to develop anti-addiction enzymes and brain chemistry at the NIH Addiction Research Center. Additionally, using powerful brain scanning equipment, CTAC and the Addiction Research Center at Johns Hopkins University are attempting to pinpoint where and how the brain is affected by cocaine.

Development of video and audio surveillance equipment. CTAC is working on an operational prototype system capable of detecting conversations in an urban environment at a much greater distance. Such a technology, in conjunction with improved video surveillance of alleged drug suspects will make drug undercover work safer for officers while providing more reliable evidence for prosecution.

Airborne system for information, navigation and command. CTAC and the Mayo Foundation in Minnesota, have been working on an enhanced system for law enforcement officers to detect illegal drug trafficking. Using a radio link and employing laptop computers installed in squad cars, surveillance teams

would be able to conduct operations while they exchange critical information with a command center at headquarters. From their squad cars, officers would be able to track drug traffickers' vehicles, display city street and building information, receive information about the suspects, and coordinate mobile surveillance teams. This new technology blends satellite communications, advanced homing devices and computer-generated maps to identify remote locations.

Similar systems are being looked at in conjunction with the Yonkers, New York Police Department, Narcotics Branch and with the Department of Defense's Advanced Research Projects Agency (ARPA).

DRUGFIRE - The linking of shooting incidents. CTAC and the Federal Bureau of Investigation (FBI) is developing an enhancement to the existing DRUGFIRE System, which matches weapon-specific markings on cartridge cases typically recovered from crime scenes. The linking of shooting incidents by comparing cartridge cases leads to the identification of those individuals involved in serial shootings. Further work is needed to assure that as more jurisdictions network into the DRUGFIRE system, the database is not overwhelmed.4

Robocops

The Cold War concluded, many now view crime as the gravest threat to U.S. national security. As Pentagon researchers and defense contractors explore new missions and markets, military technology is being mobilized to "leapfrog law enforcement well into the 21st century."

BY DAVID C. MORRISON

Washington's national security apparatus may be twisted up in knots over North Korea's potentially perilous atomic ambitions. But rank-and-file Americans are far more stressed by a national security threat much closer to home: crime.

Not a few of America's beleaguered citizens are urging desperate measures. "It's time to send the Army into our cities to restore order," a distressed Angeleno urged in a late-March *Los Angeles Times* opinion piece. "Why should we be sending thousands of troops to restore order in Mogadishu when, on most days, Los Angeles, New York, Chicago and Washington experience worse gunfire?"

Last year, in fact, Washington Mayor Sharon Pratt Kelly floated the notion of mobilizing the Army National Guard to restore order to the capital's shell-shocked streets. That scheme quickly came a cropper. However fearful and frustrated, it seems, most Americans are not prepared—yet, at least—for the prospect of armored personnel carriers rumbling down their boulevards.

But that does not mean that the Pentagon has no role to play in the war on crime. It has, it turns out, not by deploying troops but by redirecting to civilian law enforcement the sophisticated technology spawned by billions and billions of tax dollars.

The nexus for this seemingly unlikely technology transfer is the Justice Department's National Institute of Justice (NIJ). Created by the 1968 Safe Streets Act, the NIJ sponsors research on crime and its control. One of the institute's earliest achievements was taking Kevlar, the superstrong plastic yarn used to beef up automobile tires and, calling on the expertise of a wide range of government agencies, weaving it into flexible, bullet-proof body armor. Since the mid-1970s, Justice estimates, its soft body armor has saved more than 1,500 police officers' lives.

More recently, the institute invented a cheap and portable means of lifting faint fingerprints and, in partnership with the National Institute of Standards and Tech-

nology, devised a quick and easy way to identify DNA "fingerprints" without using radioactive materials.

The nation as a whole spends more than \$75 billion on law enforcement and criminal justice, but research and development accounts for only a tiny drop in that bucket. In fact, the NIJ calculates, only a minuscule 0.0007 per cent of the \$67 billion that the federal government currently spends on R&D aids police work.

"State and local police, who . . . handle well over 95 per cent of the crime in this country, are still equipped much as was Wyatt Earp in the late-19th century," David G. Boyd, the NIJ's director of science and technology, told the House Armed Services Research and Technology Subcommittee at a March 22 hearing on defense technology and law enforcement.

But, he added, "with the drawdown of defense spending and a greatly enhanced focus on technology transfer by both the Department of Defense and the intelligence community to pressing national social needs, we have an extraordinary window of opportunity to leapfrog law enforcement well into the 21st century."

Some startling law enforcement tools are now just faintly visible through that window. Imagine a "foam thrower" that can ensnarl a fleeing suspect 50 feet away in a sticky mass of nontoxic goo. Or a pyrotechnic flashlight generator that can temporarily blind and disorient unruly suspects or mobs. Suppose, too, that the police have a device with which to tag fleeing cars electronically so that they can be tracked without high-speed chases, which caused more than 1,200 injuries in California alone last year.

And what if the law enforcement arsenal included a dart-delivered anesthetic that could temporarily immobilize drug-crazed suspects, obviating the use of deadly force? How many lives would be saved by a handgun that can be fired only by its owner, or a device that can reliably detect handguns at a distance?

Does all this sound like a bored patrolman's Buck Rogers daydreaming? Wrong. Each of those projects is in devel-

opment today. The Energy Department's Lawrence Livermore National Laboratory is troubleshooting on the disorienting flash generator right now, for instance.

Energy is also using the immobilizing foam today, to trap anyone foolish enough to try to break into one of its nuclear weapons storage igloos. All the NIJ had to do was devise a gun mechanism to fire it. (Cleaning up the foam remains a problem: Baby oil will wipe the gunk off the skin. The NIJ figures that clothes it comes into contact with will have to be thrown away. Wiping the extraordinarily sticky stuff up from the pavement is another matter, however.)

There is no "magic bullet" that will stop crime cold, of course. Nor is high technology in and of itself any substitute for the social policies needed to attack crime at its roots.

But, Chicago police superintendent Matt Rodriguez recently said, "we have entered an era in which technology is not only desirable, but necessary to effectively combat crime. Our technological needs—and our need for partnership with the high-tech community—have never been greater."

If so, and considering the high political profile that crime has recently assumed, the NIJ-Pentagon dual-use initiative has a surprisingly low profile. Neither the House nor Senate version of the controversial crime bill now being dickered over, for instance, has much to say about technology transfer.

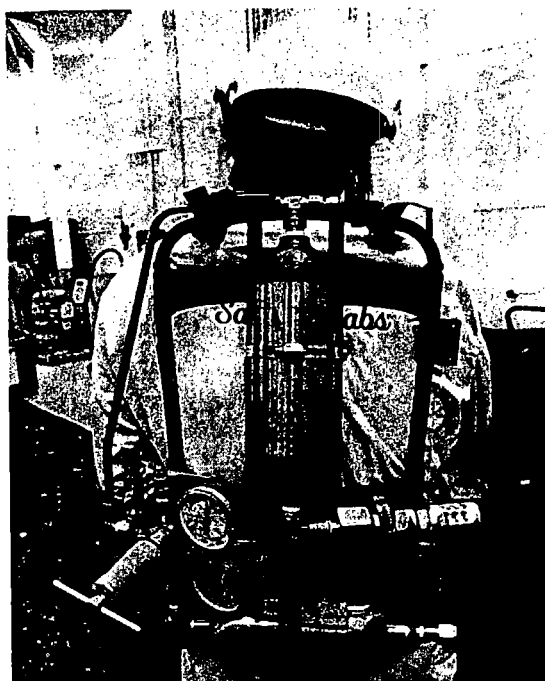
"I think it's sad, but just a continual oversight," Rep. Patricia Schroeder, D-Colo., who chairs the Armed Services research panel and is a senior member of the Judiciary Committee, said in an interview. "It's never been a focus. The Judiciary Committees are not involved in this yet. People don't think of [Justice] as being high-tech or having research and development or anything like that. So we're plowing new ground here."

MARRIAGE OF CONVENIENCE

Technology transfer between the Defense and Justice Departments is very much a matter of convenience: the needs of a wide variety of players conveniently intersect.

More than anything else, the tiny NIJ needs to leverage its meager assets. Where Boyd came from—he left the

READY . . .



Army's operational, test and evaluation command in 1992 as a lieutenant colonel to assume the helm of the NIJ's new science and technology office—personnel was measured in the tens or hundreds of thousands of troops, and budgets in the billions of dollars.

The National Institute of Justice employs fewer than 40 people, by contrast, and boasts a budget of merely \$22.5 million. The science and technology shop, set up in 1992, has a staff of only four—count them, four—people, and a mere \$5 million to spend this year.

What fiscal legerdemain keeps all of these technical balls in the air? "When you have our kind of budget, you need to find projects that will be developed on somebody else's dollar," Boyd explained in an interview. Under the technology transfer program formally launched last year when Attorney General Janet Reno fired off letters to the Defense Department and the CIA, those bucks belong largely to the Pentagon and its contractors.

Directly and indirectly, the NIJ's access to those bucks is facilitated by Clinton Administration defense conversion initiatives, the largest of which is the Technology Reinvestment Program, administered by the Pentagon's Advanced Research Projects Agency (ARPA). (Signaling its

newly stressed role as a sponsor of civilian as well as military innovation, that agency recently struck "Defense" from its name.)

Financing on a cost-shared basis the development of dual-use projects, the reinvestment program has thus far attracted more than 2,800 proposals, paying for 212 of them with \$605 million in federal grants.

Last year, GDE Systems Inc., a San Diego electronics firm, approached ARPA with a proposal to develop its "remote consultation information system," a video and sensor system designed for Army medics. GDE failed to win a reinvestment grant. But, "as we developed the technology for [the grant proposal], we . . . realized that we had a product which has direct application to

AIM . . .



law enforcement," GDE president Terry A. Straeter said. "The very same technologies demonstrated for the Army medic are directly applicable to the policeman on the beat."

A miniature color television camera mounted on the officer's shoulder would transmit images back to headquarters, augmented by two-way audio communications. In case backup is needed, a receiver tapping into the Pentagon's NAVSTAR Global Positioning System satellite network would pinpoint for headquarters the officer's location. If the officer is injured, a wristwatch "personal status monitor" would also transmit vital signs to the precinct station.

"All of these technologies exist today, and merely have to be repackaged and

configured for the law enforcement officer," said Straeter, who foresees a \$2.4 billion market for his product.

Among other items, Reno's June 3, 1993, letter to then-Defense Secretary Les Aspin also emphasized the NIJ's interest in exploring dual-use applications for a weapon with selectable, or "over and under," lethal and nonlethal capabilities, as well as in high-power, low-frequency "acoustical beam" weapons that the Pentagon is considering as a crowd control device.

In light of the messy bloodbath—and no-less-messy political fallout—that ensued when Reno's FBI seized the Branch Davidians' Waco (Texas) compound last April, Reno's fascination with nonlethality is understandable. But Justice records show that the department's interest in nondeadly technology is long-standing. One study of the subject dates as far back as 1967.

Pentagon involvement with nonlethal weaponry is of more recent provenance. Military interest has been sparked by the mounting likelihood that overseas incursions will increasingly involve peacekeeping or peace-making—like the just-concluded misadventure in Somalia, for example—in which a premium is placed on sharply limiting casualties on all sides. (For more on nonlethal weapons projects, see *NJ*, 11/7/92, p. 2589; 3/28/92, p. 758.)

Reflecting on the U.S. experience in Somalia and the potential promise of nonlethal arms in a speech last October to the Association of the U.S. Army, Aspin reflected that "the new weapons would be valuable for crowd control or dealing with hostile civilians."

Ideally at least, the Pentagon and the police have rather different criteria when it comes to dealing with hostile civilians. As Reno stressed in a speech prepared for a seminar on nonlethal defense hosted by the Johns Hopkins University's Applied Physics Laboratory last November, these are differences that defense technologists should bear in mind as they lend a hand to the NIJ.

"Your standard for nonlethal technologies is generally one of minimizing collateral damage; our standard is the elimination of any collateral damage," Reno said. "In the military, the mission comes first, even if it means sometimes sacrificing the safety of bystanders. For the offi-

cer, it is the safety of those bystanders that is paramount."

SMART GUNS, NO NUKES

Not all of the police projects being pursued under the dual-use initiative necessarily have a direct military application. A "safe gun" that can be fired only by its owner is a project that Schroeder is particular keen to see developed. As many as 1 in 4 of the 150 police officers killed each year are murdered with their own weapons. Moreover, hundreds of children die every year playing with their parents' handguns. Schroeder last year inserted language in the fiscal 1994 Defense Authorization Act under which ARPA, in consultation with the NIJ, will sponsor a

policy at Johns Hopkins, assured a Senate panel last month. A low-technology approach to this challenging task might involve putting combination locks on the guns, he suggested. A trickier tack might have the gun owner wear a special ring that must touch the weapon before it can fire.

A "truly safe gun" would be "immensely important for law enforcement and civilian gun users," ARPA director Gary L. Denman wrote Schroeder in January. "Although military utility is not as evident, I agree with you that the subject warrants this agency's attention."

That said, one might wonder what the Pentagon stands to gain under the five-year memorandum of understanding now being negotiated between Justice and Defense. Appearances to the contrary, the dual-use initiative is not a one-way street running solely in the NIJ's favor; the Pentagon is looking for direct benefits as well.

"There is a very important military motivation for our alliance with [Justice]," Anita K. Jones, the Pentagon's director of defense research and engineering, told Schroeder's committee last month. "With the passing of the Cold War era, the U.S. armed forces are increasingly being given missions that are quite different from the traditional wars of attrition and destruction."

"Military rules of engagement for [peacekeeping and humanitarian relief missions] place severe limitations on casualties and collateral damage in military operations, often resulting in the same set of options afforded to the policeman," Jones continued. "This convergence of roles has stimulated discussion between [Pentagon and Justice Department] users and developers alike."

As that remark suggests, recent months have seen considerable to-ing and fro-ing between the Pentagon and Justice. The first of three planned "ARPA/Justice Department Days" has been staged, at which "mutually attractive development programs" were hashed out.

No fewer than three high-level panels have been beavering away to define the two departments' mutual needs in this area. Promi-

nent among those is an NIJ-sponsored board charged with identifying military and intelligence community technologies that would be likely candidates for development.

Chaired by retired Rear Adm. E.A. (Al) Burkhalter Jr., former director of

... YUCK !



On the way: "foam throwers" that fire nontoxic goo

\$1.5 million effort by the Energy Department's Sandia National Laboratory to develop just such a weapon.

"Handguns can be made so that they are 'personalized,' i.e., they can be operated only by the authorized possessor," Stephen P. Teret, a professor of health



Coming soon to a neighborhood near you? Probably not, but lots of other military technology may be.

the intelligence community management staff at the CIA, this panel includes such prominent figures as former FBI director William H. Webster; retired Gen. Paul F. Gorman, former chief of the U.S. Central Command and a noted Army technologist; retired Adm. Paul A. Yost Jr., former Coast Guard commandant; Baltimore Mayor Kurt Schmoke; and Police Foundation president Hubert Williams, who chaired the panel that investigated the 1992 Los Angeles riot.

With only four people on staff, the NIJ's science shop would seem to confront a hopeless task knitting together the far-flung policing community, which comprises more than 17,000 individual departments. "That's why we've created partnerships with the International Association of Chiefs of Police, the American Corrections Association and the like," the NIJ's Boyd said. "We spend a lot of time giving interviews to law enforcement journals or writing pieces for them. We also get to the law enforcement community by going to their conferences"—the National Sheriff's Association convention, for instance.

These are highly efficient conduits for Boyd's message. The police chiefs' association, for one, has roughly 13,000 members in 80 countries, some 90 per cent of them here in the United States. The group periodically issues a *Science & Technology Executive Brief*, and its journal, *Police Chief*, reaches 30,000 readers every month.

"So, when David Boyd produces a report and then works with us to communicate that study out to the field," association executive director Daniel M. Rosen-

blatt said, "we would cover a vast majority of police departments in the United States."

The NIJ also gets its messages out through a time-honored Washington medium—conferences. On June 20-22, the NIJ is sponsoring a session in Washington, titled "Law Enforcement Technology for the 21st Century: The Less Than Lethal Alternative." Boyd hopes to attract droves of law enforcement officers to hear Reno, Defense Secretary William J. Perry and others speak.

Last November, besides Reno, Boyd also spoke at the classified nonlethal defense conference at Johns Hopkins, which was sponsored by the Los Alamos National Laboratory. Edward Teller, the "Father of the H-bomb," also appeared. His idea of nonlethality was to warn civilians to get out of the way and then scatter 100-ton mininukes all about. "Law enforcement, at the moment, has no real interest in nuclear devices," Boyd said drily.

A GRUNT'S-EYE VIEW

In typical Washington fashion, pushing this initiative forward will require lots of councils and steering groups and meetings followed by more meetings. ARPA will form a "joint program steering group" to oversee the Justice-Defense development projects. The Attorney General and the Pentagon's director of research and engineering will meet twice yearly to review projects, set policy and hash out financing.

Already, the NIJ has organized twice-yearly meetings of a "technology assessment program advisory council." With 85-90 chiefs of police and sheriffs from the United States and Canada as members and chaired by the Ithaca (N.Y.) chief of police, this panel ensures that the NIJ keeps in touch with the needs of real-world cops.

When the advisory council met on Dec. 3, the NIJ asked its members to rank by priority a list of technologies in development that ARPA had provided a few days earlier. The most important requirement, the council decided, was "a nonintrusive weapons detection capability."

It so happens that Raytheon Corp., a major defense contractor, is working on a system that could distinguish a concealed firearm from car keys, belt buckles and the like using electromagnetic pulses. The NIJ has recommended that ARPA sponsor a two-year, \$2.5 million drive to develop a device that could be handheld, mounted in a vehicle or placed at the entrance to courts and schools.

Ranked second on the council's wish list was a broad range of less-than-lethal systems, including means for controlling crowds, stopping vehicles without harming passengers or bystanders, restraining uncooperative suspects and mounting hostage rescues. Third was a personnel monitoring and tracking system, such as the remote consultation system that GDE is ginning-up.

Two other NIJ-sponsored panels also labor to ensure that technology schemes under consideration are grounded in reality. A liability task group, made up of lawyers, retired judges and law school faculty and students, strives to identify potential liability issues to avoid legal problems down the road.

Similarly, a community acceptance panel—made up of such interest groups as Handgun Control Inc., the National Rifle Association, the League of Women Voters of the U.S. and police review boards—is charged with identifying issues that could render a promising technology simply unacceptable.

The NIJ's investigation of alfentanil, a powerful surgical anesthetic, as an alternative to batons or high-voltage Taser darts for taking down violent suspects provides a case in point of the sort of concerns that must be weighed. (*For more on the alfentanil project, see NJ, 6/6/92, p. 1358.*)

While promising, this "chemical club" sparked at least two serious worries. Often cut with street heroin, fentanyl compounds have caused innumerable fatal overdoses in recent years. Administering so potent a substance to an involuntary recipient who may already be loaded on who knows what other drugs is perilous. Simply shooting darts into people raises questions to begin with; Taser barbs must occasionally be surgically removed.

After much study and consideration, Boyd said, "we now think it may be possible to deliver both the anesthetic agent and an antidote simultaneously. If you can deliver the antidote in the right proportion, then you make those anesthetic agents vastly safer. But this is still something that's two to four years in the future."

Likewise, pepper spray—a form of chemical mace using capsaicin, the very active ingredient in hot chili peppers—has come into widespread police use. But

no safety studies have been done, even though records since 1990 show that 30 suspects who were sprayed died in custody.

The NIJ thus gave a small grant to the International Association of Chiefs of Police to assemble a study team. That team recently concluded that capsaicin was not the culprit, but rather the practice of placing hog-tied, and often drunk and overweight, suspects face down in the back of patrol cars. The result in 80 per cent of the deaths in custody is "positional asphyxia." The NIJ and the police chiefs group are getting that word out.

"A lot of departments began to back off pepper spray when the issue hit; they are reinstating it," Boyd said. "There's no such thing as a technology that is perfect and 100 per cent safe. Every time you introduce a new technology, you introduce new problems."

Besides broadcasting the news about nifty gizmos looming on the technological horizon, Boyd is also keen on hearing directly from street-level police grunts on what tools of the trade they would like, he said, "rather than from a bunch of technologists sitting around in a room saying, 'This would be neat.'" After all, 95 per cent of law enforcement is conducted far from the FBI's gleaming crime labs.

Beat officers are also likely to raise practical considerations that don't necessarily occur to white-coated types. On the NIJ's behalf, for example, the Energy Department's Idaho National Engineering Laboratory is working on an air-bag restraint for the backseats of patrol cars, much like front-seat safety air bags. If a suspect gets unruly in the backseat, an officer can press a button, inflating a large air bag housed in an overhead clam-shell device.

The designers ensured that the air bag inflates slowly, so that it doesn't crush the suspect. The bag's material is permeable so that the suspect doesn't suffocate. And replacing a used bag will run a fraction of the \$1,000-plus that it costs to repack high-velocity safety air bags. But, Boyd said, from their ground's-eye view, "the police have looked at it and asked, 'How do we clean this up if the guy does things we don't want to talk about. And is it bite and tamper-proof?'"

HOSTILE URBAN ENVIRONMENTS

What does the defense industry get out of this dual-use initiative, especially when companies are expected to shoulder their share or more of the development costs? For the most part, companies want access to a potentially vast new market. Counting corrections departments, fire and rescue agencies and the private security industry along with regular police forces,

law enforcement employs more than three million officers.

At the same time, it's hard to imagine a more fractured market. More than 90 per cent of the nation's 17,360 peace and police agencies, most of whom do their purchasing independently, employ fewer than 30 sworn officers.

For contractors used to dealing with a single buyer—the Pentagon—but keen on tapping into the vast law enforcement business with new technical products, the scattered nature of the marketplace has been endlessly frustrating. Save for uniforms, nightsticks and handcuffs, therefore, very few products are developed exclusively for the police. Even 90 per cent of the pepper spray sold is bought by civilians.

"This structure has led to some remarkable differences between our coun-

Pushing these initiatives forward will doubtless require lots of councils and steering groups and meetings followed by more meetings.

try's approach to national defense and our war on crime," David J. Beck, the general manager for Westinghouse Electric Corp.'s law enforcement division, told Schroeder's panel last month. "While the [Pentagon] spends an average of 12-15 per cent of its annual budget on R&D, law enforcement expends well under 1 per cent."

Typical of companies looking to develop a new market for their products in the post-Cold War defense slump, Westinghouse established its law enforcement division in 1992. "From a contractor's perspective, we have made significant investments to adapt defense technology for the war on crime," Beck said. The company has applied the image-processing and pattern recognition techniques that it developed for the Longbow targeting radar to fingerprinting, for example, and its military command and con-

trol software to mobile computers in police cars.

"Defense industry would desperately like to find a new niche," Boyd said. "And there are a lot of them looking to get into [the law enforcement market]. Most of them come to us and say, 'We've been trying to get into this market for a long time and can't. What can you tell us to do?'"

The central thrust of the dual-use technology transfer initiative of course is for the NIJ to act as a central clearinghouse, drawing on these companies' Cold War-honed engineering expertise to ensure that America's police are as well armed as its soldiers.

A remarkable law enforcement technology being developed by Alliant Technologies Inc., a Minnesota-based contractor, epitomizes this whole effort. As might be expected, the defense firm has even dreamed up an elaborate acronym—Systems for the Effective Control of Urban Environment Security, or SECURES—for its product.

Drawing on its experience building antisubmarine warfare systems for the Navy, Alliant has devised a low-cost acoustic sensing and analysis module. Placed in a grid, one module every intersection, over a gun-plagued swath of city, SECURES will instantaneously detect, recognize and pinpoint the location of gunfire, allowing police or ambulance units to report to the scene 85 per cent faster than they otherwise could. (The acoustic modules will not be able to pick up speech, Alliant says.)

Like the other dual-use systems described here, SECURES is not as pie-in-the-sky as it might sound. Last month, the District of Columbia Police Department provided the weapons, ammunition, fireworks and personnel for live fire tests at Fort Meade in suburban Maryland. In the summer of 1995, Alliant will conduct a pilot program, emplacing SECURES modules over a 10-square block of the District, where some 500 citizens are murdered every year.

Like other creators of projects enrolled with the NIJ, Alliant hopes to sell the Pentagon on SECURES' military benefits. "SECURES could be rapidly deployed to hostile urban environments like Mogadishu and Sarajevo," according to William M. Labuda, director of Alliant's advanced-technology center, "and used to cue U.S. or other peacekeeping forces to the presence and location of gunfire."

Why not? The extreme hostility of our own "urban environments" is precisely the tragic fact of life that is driving the transfer of technology from America's military to its police forces in the first place. ■

CrimeTech Distribution List

Name	Agency	Phone	Fax
Liz Bernstein	WH/Communications	456-7845	456-2239
Dr. Al Brandenstein	CTAC	395-6781	395-6775
Jose Cerda	DPC	456-5568	456-7028
Thomas Espy	DOC	482-5061	482-2693
Timothy R. Fain	OMB	395-3561	395-7285
Jami Floyd	OVP	456-7871	456-6231
Tom Kalil	NEC	456-2801	456-2223
Holly Kulka	Treasury	622-1456	622-1423
Kent Markus	Justice	514-3008	514-0467
Bruce W. McConnell	OMB	395-3785	395-7285
Bill McDonnell	Treasury	622-0260	622-1423
Michael R. Nelson	OSTP	456-6039	456-6023
Jennifer O'Connor	WH/Cabinet Affairs	456-2572	456-6704
Jonathan Prince	WH/Communications	456-7151	456-2362
Andy Tomback	Treasury	622-1820	622-1423
Keith Walton	Treasury	622-1448	622-1423

enforcement agencies and to plan, coordinate and implement future shared use wireless telecommunications systems and resources. A nation-wide wireless network will have the following benefits for the government and its citizens:

- ♦ Nationally available police access to fingerprints, mug shots, stolen vehicle files and weapons files. The ability to quickly pass the description of a suspect over a common radio channel can result in quick apprehension and arrest.
- ♦ Improved rapid response by public safety officials to natural disasters and other national emergencies.
- ♦ More efficient use of Spectrum, a valuable network that provides a wide range of commercial and public applications of wireless technologies.

Memorandum of understanding between the Department of Defense and the Department of Justice. The MOU was entered into on April 20, 1994 and is a five-year agreement to jointly develop and share technologies which are necessary for both law enforcement and military operations other than war. Examples of some of these technologies as they pertain to law enforcement technical support are:

- ♦ Inexpensive night vision goggles;
- ♦ Virtual reality training, simulation and mission planning; and
- ♦ Devices that can detect bombs, mines, and weapons.

GOAL 8: ENHANCED DOMESTIC AND PERSONAL SECURITY

The random nature of crime and its escalating level of brutality has led to a rising tide of fear in the neighborhoods, schools and homes of the American people. Technology can help to allay some of these fears. It has been estimated that if crime were to be reduced by just one percent, this would translate to 230 less murders, 1,000 fewer rapes, 17,000 fewer assaults, 14,000 fewer victims of crime requiring health care, and a \$700 million reduction in economic costs. The following are areas that have been identified for additional emphasis.

Memorandum of understanding between the Department of Defense and the Department of Justice. (See reference above). In addition to those items already mentioned, the following are priorities identified under the MOU that pertain to domestic and personal security:

- ♦ Less-than-lethal weapons that use blinding light or sticky foam;

July 7, 1994

MEMORANDUM TO JOHN H. GIBBONS AND ALICE RIVLIN

FROM: BRUCE REED

SUBJECT: FY 1996 Research and Development (R&D) Priorities

Thank you very much for the memorandum of May 6, 1994 regarding R&D priorities. There is no question that it is critical to identify and coordinate various initiatives so that guidance may be provided to the agencies as they prepare their FY 1996 budget requests. I feel very strongly, however, that a critical segment has not yet been identified -- the area of law enforcement technology.

This Administration has made the war against crime a top priority and the ~~proposed~~ Crime Bill represents a tremendous opportunity to push crime-fighting technology forward at a Federal level, and also for the Federal agencies to provide guidance and support to states and local entities as they strive to enter the 21st century in law enforcement technology. Attention to this particular area of R&D is critical because the nation is demanding more effective and creative methods to fight crime.

Furthermore, expansion in this area ties into other stated goals such as a healthy citizenry (reduced crime levels means fewer associated health costs) and job creation and economic growth (defense conversion, as well as a coordinated supply of contracts and goods to an ever-growing cottage industry in private security). I would suggest the following priorities be added with the accompanying text.

GOAL 7: LAW ENFORCEMENT TECHNICAL SUPPORT

The National Institute of Justice (NIJ) estimates that of the \$67 billion the federal government spends on research and development only .0007 per cent of those monies goes to assist police work. Yet our police forces are the front lines in the war against crime and the following priorities have been identified to provide them with the technology and tools to do their jobs safely and effectively.

Memorandum of understanding between the Department of Justice and the Department of the Treasury. The MOU established the Federal Law Enforcement Wireless Users Group (FLEWUG) as a joint agency initiative to share information concerning wireless communications issues among federal law

August 5, 1994

MEMORANDUM TO JOHN H. GIBBONS AND ALICE RIVLIN

FROM: BRUCE REED

SUBJECT: FY 1996 Research and Development (R&D) Priorities

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Furthermore, expansion in this area ties into other stated goals such as a healthy citizenry (reduced crime levels means fewer associated health costs) and job creation and economic growth (defense conversion, as well as a coordinated supply of contracts and goods to an ever-growing cottage industry in private security). The following is a brief listing of law enforcement technologies that are currently in development, as well as initiatives and strategies that are in the near future:

I. The National Institute of Justice Technology Transfer Program

Attorney General Reno issued letters to the Secretary of Defense and the Director of the Central Intelligence Agency to initiate this program. The letter was in response to a Congressional interest that NIJ work to develop **less-than-lethal** technology. To date, this partnership has produced the following technologies and initiatives:

- * A prototype rear seat airbag to better restrain uncooperative prisoners in back seats of police cars;
- * A prototype barrier strip to safely deflate tires;
- * velocity adjusting weapons to allow the firing of rubber bullets and other projectiles safely from any distance;

- ♦ "Smart guns" that can only be fired by an authorized user (Hundreds of children die every year playing with their parents' handguns, and one-in-four of the approximately 150 police officers killed each year are murdered with their own weapons. National Journal, April 16, 1994 at 891);

Navigation, surveillance and command systems for use by law enforcement officers. The Office of National Drug Control Policy (ONDCP) through its Counterdrug Technology Assessment Center (CTAC) is developing new technologies to improve law enforcement response time. This will be done by using sophisticated satellite communications and miniaturized global positioning systems to instantly pinpoint remote locations. (Referenced below).

Increased School Security. The Department of Education and CTAC are coordinating efforts to improve school security through better and more sophisticated sensor and surveillance technology.

GOAL 9: DRUG CONTROL TECHNOLOGY

There is no doubt that there is a strong and tragic link between drugs and violent crime. One cannot effectively be combatted without due attention to the other. R&D efforts must address the growing drug culture in this country. The following items have been identified for additional emphasis in FY 1996.

Chemical and biological testing to overcome drug-addiction. CTAC is working with Columbia University to develop anti-addiction enzymes and brain chemistry at the NIH Addiction Research Center. Additionally, using powerful brain scanning equipment, CTAC and the Addiction Research Center at Johns Hopkins University are attempting to pinpoint where and how the brain is affected by cocaine.

Development of video and audio surveillance equipment. CTAC is working on an operational prototype system capable of detecting conversations in an urban environment at a much greater distance. Such a technology, in conjunction with improved video surveillance of alleged drug suspects will make drug undercover work safer for officers while providing more reliable evidence for prosecution.

Airborne system for information, navigation and command. CTAC and the Mayo Foundation in Minnesota, have been working on an enhanced system for law enforcement officers to detect illegal drug trafficking. Using a radio link and employing laptop computers installed in squad cars, surveillance teams

would be able to conduct operations while they exchange critical information with a command center at headquarters. From their squad cars, officers would be able to track drug traffickers' vehicles, display city street and building information, receive information about the suspects, and coordinate mobile surveillance teams. This new technology blends satellite communications, advanced homing devices and computer-generated maps to identify remote locations.

Similar systems are being looked at in conjunction with the Yonkers, New York Police Department, Narcotics Branch and with the Department of Defense's Advanced Research Projects Agency (ARPA).

DRUGFIRE - The linking of shooting incidents. CTAC and the Federal Bureau of Investigation (FBI) is developing an enhancement to the existing DRUGFIRE System, which matches weapon-specific markings on cartridge cases typically recovered from crime scenes. The linking of shooting incidents by comparing cartridge cases leads to the identification of those individuals involved in serial shootings. Further work is needed to assure that as more jurisdictions network into the DRUGFIRE system, the database is not overwhelmed.

- * the creation of teams at the five national laboratories involved in NIJ projects, to better develop these technologies;

The NIJ has also initiated several of its own projects *on various tech.:*

- * Development of a weapon that can be fired only by its owner; "smart guns" ~
- * disorienting or dazzling light systems with protective eyewear for police;
- * Identification of anesthetic compounds with high safety margins;
- ✓ * Better ~~insuring~~ ensuring the efficiency of DNA identification;
- * putting key reference material on CD ROMs;
- * developing, publishing and administering standards for law enforcement equipment such as soft body armor, DNA identification technologies, handguns, handcuffs, police car packages and other equipment.

II. Advance Research Projects Agency (ARPA)/NIJ List for Development

ARPA asked NIJ to look at a list of technologies they were considering for development and identify those items that were enforcement priorities. They included:

- * A device capable of identifying handguns, which has greater discriminating power than existing metal detectors;
- * A range of less-than-lethal technologies; (~~is a~~ sticky foam)
- * A modified personnel status monitor and remote surgical system, (currently being considered for development for use by military medical personnel) which, if adapted for law enforcement, would strengthen the ability of foot officers to to work in a genuine community policing role, knowing they can get immediate assistance if needed.

III. Memoranda of Understanding

Vice President Gore, in February of this year, brought together Attorney General Reno, Secretary of the Treasury Bentsen and Deputy Secretary of Defense John Deutch to sign two major MOUs.

* Justice/Treasury MOU

Establishes a new Federal Law Enforcement Wireless Users Group to tackle electronic communications data transfer interoperability problems among federal law enforcement agencies.

FLWUG

* Justice/Defense MOU

Established a new Joint Program Steering Group to identify, develop and transfer to law enforcement useful defense technologies. This is a five year commitment. *Some the shared technologies include:*

*. smart guns
. less-than-lethal
. night vision goggles
. virtual reality
train*

IV. Drug Control Technology

The Office of National Drug Control Policy has been working alone and with other agencies to develop technologies that will have particular effect in fighting drug related crime:

* **Chemical and biological testing to overcome drug-addiction.** The Counterdrug Technology Assessment Center (CTAC) is working with Columbia University to develop anti-addiction enzymes and brain chemistry at the NIH Addiction Research Center. Additionally, using powerful brain scanning equipment, CTAC and the Addiction Research Center at Johns Hopkins University are attempting to pinpoint where and how the brain is affected by cocaine.

* **Development of video and audio surveillance equipment.** CTAC is working on an operational prototype system capable of detecting conversations in an urban environment at a much greater distance. Such a technology, in conjunction with improved video surveillance of alleged drug suspects will make drug undercover work safer for officers while providing more reliable evidence for prosecution.

* **Airborne system for information, navigation and command.** CTAC and the Mayo Foundation in Minnesota, have been working on an enhanced system for law enforcement officers to detect illegal drug trafficking. Using a radio link and employing laptop computers installed in squad cars, surveillance teams would be able to conduct operations while they exchange critical information with a command center at headquarters. From their squad cars, officers would be able to track drug traffickers' vehicles, display city street and building information, receive information about the suspects, and coordinate mobile surveillance teams. This new technology blends satellite communications, advanced homing devices and computer-generated maps to identify remote locations. Similar

systems are being looked at in conjunction with the Yonkers, New York Police Department, Narcotics Branch and with the Department of Defense's Advanced Research Projects Agency (ARPA).

*** DRUGFIRE and CEASEFIRE - The linking of shooting incidents.**

Drugfire:

CTAC and the Federal Bureau of Investigation (FBI) is developing an enhancement to the existing DRUGFIRE System, which matches weapon-specific markings on cartridge cases typically recovered from crime scenes. The linking of shooting incidents by comparing cartridge cases leads to the identification of those individuals involved in serial shootings. Further work is needed to assure that as more jurisdictions network into the DRUGFIRE system, the database is not overwhelmed.

Ceasefire:

The ATF is developing a comprehensive strategy to provide support to law enforcement in areas of the country experiencing serious gang and drug-related shooting incidents. This strategy provides law enforcement direct access to ATF's resources:

- ♦ National Tracing Center (NTC) provides the means to trace firearms recovered in criminal investigations;
- ♦ The development and implementation of a procedure utilizing the National Law Enforcement Telecommunications System or other communications systems to directly submit trace requests from other law enforcement agencies to the NTC;
- ♦ The Firearms Technology Branch provides expert technical support to ATF, other Federal agencies, State and local law enforcement, the firearms industry, the Congress and the general public.
- ♦ Integrated Ballistic Identification System, which allows for the quicker analysis and matching of bullet signatures.

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET
Washington, D.C. 20503

July 18, 1994

LEGISLATIVE REFERRAL MEMORANDUM

LRM #M-1660

TO: Legislative Liaison Officer -

JUSTICE - Sheila F. Anthony - (202) 514-2141 - 217
ONDCP - Babette Hankey - (202) 395-6739 - 257

FROM: JAMES J. JUKES (for) *JJ*
Assistant Director for Legislative Reference

OMB CONTACT: RONALD JONES* (395-3386)
Secretary's line (for simple responses): 395-3454

SUBJECT: TREASURY Proposed Testimony on Developments
in Firearms Technology

DEADLINE: 4:00 PM July 19, 1994

COMMENTS: This testimony is for a hearing on firearms
technology on Thursday, July 21. Both Justice and treasury
are testifying.

OMB requests the views of your agency on the above subject before
advising on its relationship to the program of the President, in
accordance with OMB Circular A-19.

Please advise us if this item will affect direct spending or
receipts for purposes of the the "Pay-As-You-Go" provisions of
Title XIII of the Omnibus Budget Reconciliation Act of 1990.

CC:
C. Brown - *Comments*
M. Schwartz - *NOC* 7/19
Tim Fain - *BE*
J. Cerda

C/PA 7-19-94
R Jones to J. J. Jukes
Change per Brown

Mr. Chairman and members of the Subcommittee, thank you for the opportunity to appear today and testify on new developments in technology relating to firearms; specifically, commenting on ATF's "CEASEFIRE" violent crime strategy.

In the past three decades, violent crime has been a constant concern of the American public. In 1967, after 2 years of study, the Commission on Law Enforcement and the Administration of Justice reported that "the existence of crime...and the fear of crime, have eroded the basic quality of life of many Americans."

Now almost 30 years later, whether committed by organized criminals, gangs, or street thugs, violent crime continues to tear at the fiber of civilized society around the world. In the United States, the number of firearms used in armed robberies, assaults, and murders has been escalating at an alarming rate and is now the number one concern of the American public. A National Crime Survey has found that one out of every four households has been affected by violent crime. The most serious incidents are usually confined to certain urban areas, repetitive in nature, and most often motivated by the struggle for power or control over illicit enterprises, such as drug trafficking or other illegal gang activity. This wanton violence, which is spurred by an

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indifference toward human life, is depleting the cultural and material resources of our cities.

By analyzing such information, it is evident that we need an effective and efficient means of thwarting violent crime committed with firearms. ATF, cognizant of its responsibility to maintain a leadership role in firearms matters and to provide assistance to State and local law enforcement, has developed and implemented CEASEFIRE--an enforcement strategy bringing to bear all the investigative and support resources of the Bureau aimed at addressing firearms-related violence. We expect this initiative to significantly contribute to the identification and prosecution of the most active armed violent criminals.

As every person has unique fingerprints, every firearm has unique ballistic characteristics. The barrel of a firearm leaves distinct markings on a projectile as it is expelled during firing. The breech mechanism also leaves distinct markings on the cartridge case. These markings are produced by the breech face itself, the firing pin, extractor, and ejector. Firearms examiners are able to examine bullets and cartridge casings to determine if they were expelled from a specific firearm. It has been a tedious, time-consuming process for those examiners to compare suspect ballistic

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evidence casings recovered at crime scenes to the vast inventory of recovered or test-fired projectiles and casings. The severe stress and eye-strain on the firearms examiner dramatically slows the process. Realizing that the present examination techniques were antiquated, ATF and the Department of Treasury recognized the potential benefits to law enforcement that innovative computerized, crime-fighting technology can provide. This technology can ultimately facilitate an information super highway in the solving of firearms-related violent crimes.

ATF's mission is to reduce the criminal use and illegal trafficking of firearms and to assist other Federal, State, local, and foreign law enforcement agencies in reducing crime and violence by effective enforcement of the Federal firearms laws. ATF has the ability to significantly impact on violent crime through its use of Federal laws that target firearms, armed career criminals, and armed violent offenders through the Bureau's Achilles Program. We are proud of our accomplishments in the fight against violent crime through our partnerships with other Federal, State, local, and foreign law enforcement agencies.

In addition to the enforcement of the Federal firearms laws, ATF has a unique responsibility to regulate the firearms

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industry and to collect the tax revenue generated by the firearms industry. ATF maintains a computer data base of all Federal firearms and explosives licensees in conjunction with the administration of the licensing provisions of Federal law. In addition, ATF is responsible for determining the suitability of firearms for importation and approving the importation into the United States of any firearms from foreign countries. ATF is the Federal agency that oversees and regulates the firearms industry in the United States and is the only agency that has access to all the information required to be maintained by Federal law.

The National Tracing Center (NTC) which provides around-the-clock assistance to Federal, State, local, and foreign law enforcement, provides the means to trace firearms that have been recovered in criminal investigations. ATF is the repository for records of out-of-business Federal firearms licensees in regard to their firearms sales. Since 1972, the Bureau has provided firearms tracing services to both foreign and domestic law enforcement agencies. During FY-93, the NTC conducted 57,000 traces. It is anticipated that during FY-94, the NTC will trace more than 100,000 firearms recovered in crimes worldwide.

The establishment of the NTC has achieved, for law

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enforcement, the most proficient and effective method for researching the movement of firearms. As such, the systematic tracking of firearms from the manufacturer, to the purchaser, provides investigators with valuable leads in identifying potential violations and suspects.

The NTC maintains a reference library to identify firearms, firearms manufacturers, and importers. The NTC contacts manufacturers (foreign and domestic), importers and wholesale and/or retail dealers for disposition, confirms accuracy and extent of trace, and communicates results of traces to the requester. The NTC identifies trends and trafficking patterns that provide investigative leads to the field.

The NTC is also in the development stage of implementing two additional projects to enhance the NTC's overall effectiveness and responsiveness. One of the projects pending is the Firearms Information Networked Databases (FIND). This project was initiated in April 1991 proposing a system that would meet ATF's requirements for effective tracing and tracking of crime guns submitted to the NTC, providing an interface of the existing Firearms Tracing System (FTS) to various ATF-related crime gun data bases. In developing this proposed system, the Bureau seeks to enhance

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ATF's ability to accomplish its mission, collect information from existing and proposed firearms data bases into a single system, allow FIND to search all the firearms data bases and produce responses based on one query instead of the user having to query every data base, and consolidate all of ATF's data and increase data security.

Another ongoing project is the development and implementation of a procedure utilizing the National Law Enforcement Telecommunications System (NLETS) or other acceptable communication system to directly submit trace request from other law enforcement agencies to the NTC.

The ATF Forensic Laboratories conduct firearms, toolmark, and ballistics examinations for ATF and other Federal, State, and local law enforcement agencies. The laboratory supports ATF special agents at crime scenes by providing onsite technical assistance. In addition, laboratories provide technical advice to ATF special agents and other government agencies and give expert testimony in court regarding the results of laboratory examinations and their significance in the investigation.

The Firearms Technology Branch (FTB) provides expert technical support to ATF, other Federal agencies, State and

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local law enforcement, the firearms industry, the Congress, and the general public. FTB is responsible for the technical determination concerning types of firearms approved for importation into the United States. In accordance with the Undetectable Firearms Act, FTB provides the standard for the detectability of firearms. This branch is also responsible for rendering opinions regarding the classification of illegal firearms and newly designed firearms. FTB maintains an extensive firearms reference collection, as well as technical firearms reference files and library, and firearms data bases.

In support of our law enforcement mission and to efficiently link our firearms-related resources, ATF has developed CEASEFIRE, an enforcement strategy that draws upon our expertise in enforcing Federal firearms laws and technological advances. The purpose of CEASEFIRE is to provide support to law enforcement in areas of the country experiencing serious organized criminal gang and drug-related shooting incidents. This strategy provides law enforcement direct access to ATF's:

- * National Tracing Center
- * National Laboratory (Forensics Section)
- * Firearms Technology Branch

Direct investigative support is also provided by special

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agents and Compliance Operations inspectors assigned to local field offices, who work hand-and-hand with their law enforcement counterparts to interdict the illegal proliferation of firearms to solve firearms-related crimes. ATF also provides the U.S. Department of Justice, State prosecutor's offices, district attorney's offices, and military courts with expert firearms testimony from ATF firearms enforcement officers and special agents. This testimony includes the identification and origin of firearms and other matters relating to firearms and the firearms industry.

I have attached to my testimony, for reference, a chart which briefly illustrates how each element of the CEASEFIRE strategy.

In our CEASEFIRE initiative, ATF is utilizing a unique ballistic comparison system that allows firearms technicians to digitize and automatically sort bullet signatures and aids in providing matches at a greatly accelerated rate. This technology expeditiously provides investigators with leads to solve greater numbers of crimes in a shorter period of time. An automated system for shell casing comparison has also been developed and is expected to be added to the ballistic comparison system later this year.

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As every person has unique fingerprints, every firearm has unique ballistic characteristics. The barrel of a firearm leaves distinct markings on a projectile as it is expelled during firing. The breech mechanism also leaves distinct markings on the cartridge case. These markings are produced by the breech face itself, the firing pin, extractor, and ejector. Firearms examiners are able to examine bullets and cartridge casings to determine if they were expelled from a specific firearm. It has been a tedious, time-consuming process for those examiners to compare suspect ballistic evidence to the vast inventory of recovered or test-fired projectiles and casings. The severe stress and eye-strain on the firearms examiner dramatically slow the process. Realizing that the present examination techniques were antiquated, ATF and the Department of Treasury recognized the potential benefits to law enforcement that innovative computerized, crime-fighting technology can provide. This technology can ultimately facilitate an information super highway in the solving of firearms-related violent crimes.

This Integrated Ballistic Identification System (IBIS) will for the first time provide a single system capable of comparing both types of ballistic evidence found at crime scenes. It will permit firearms examiners to quickly enter and review large numbers of fired bullets and expended

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cartridge cases. Evidentiary matches made from projectiles will be accomplished after the system makes 8,100 different comparisons in approximately 4 seconds. For cartridge cases it makes similar types of comparisons in 2 seconds.

The ballistic comparison system does not positively identify bullets or casings fired from the same weapon--that must be done by a firearms examiner. However, the system does produce a short list of candidates for the match. The numerical probability of a match is given for each candidate on the list. By doing automated searches, the system speeds up and optimizes time spent on comparisons. The best evidence in linking a firearm to a specific crime is matching the recovered projectile to the suspect firearm.

The Integrated Ballistic Identification System consists of two separate work stations--a Data Acquisition Station and an Image Analysis Station. The Data Acquisition Station is used to collect image data. It does not retrieve and compare images. Laser optics focus on the bullet's land markings, and a computer digitally maps and records the significant areas on the bullet's surface. These areas are selected and optically "marked" by the firearms examiner as the bullet is viewed while being rotated. Either a firearms examiner or a technician can be trained to enter data from crime scene

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bullets. Once a bullet is cleaned and mounted, it takes approximately 10 minutes to scan the bullet into the system. The system is capable of conducting a comparison of damaged projectiles that has sufficient markings, equivalent to only one LAN marking.

The Image Analysis Station runs the image comparison software, and it houses the data base of images generated by the acquisition station. One analysis station can handle the data from several acquisition stations. Data can be entered into the analysis station from a disk or through a communication line (modem), information processed, and automatically returned to the requester.

As stated earlier, the system does not make identifications, the firearms examiner must make the determination that from a specific firearm. Since, the system produces a list of scores that indicate the relative probability of a match (high to low), the firearms examiner can retrieve selected images for evaluation on the video screen. If the image on the screen looks as though a match could exist, the firearms examiner inspects the specimens on a comparison microscope to confirm the match.

In simple terms, the use of this technological breakthrough

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provides law enforcement the capability to examine and link evidence found at firearms-related crime scenes, which is now time and cost prohibitive for humans to perform manually.

More specifically, if you were to examine any major metropolitan city in the United States today, you would find departments tasked with investigating literally thousands of shooting incidents a year involving gang-related drive-by shootings, armed robberies and drug-related homicides, just to name a few. In the cities of New York and Chicago alone, each police department seizes over 20,000 firearms each year.

ATF is currently evaluating the technology and application of this system for nationwide deployment. Our first onsite testing started with the Washington, DC, Metropolitan Police in January of this year. The system is proving itself in the solution of criminal cases. In one investigation alone, the system connected eight homicides believed committed by a narcotics operation in the District.

The system's projectile comparison capability has made, to date, several matches of shooting incidents and/or recovered firearms. Some of the first matches that were made linked together the shootings of four homicide victims and one intimidation shooting. The target of the investigation was later killed and is one of the four homicide victims.

JUL-15-1994 17:03 FROM TO 96220073 P.14

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As a result of these four shootings, ATF worked with the Metropolitan Police Department and brought together all the investigators to investigate these crimes. That investigation, to date, has identified a total of eight homicides believed to have been committed by a narcotics network operating in Washington, DC. These homicides have been connected through the use of our ballistic comparison system and other traditional means of investigation. Through ballistic examinations, interviews, use of the grand jury, and informants, investigators have identified 11 subjects suspected of these crimes. To date, three suspects have been arrested for homicides, one straw purchaser of a firearm used in a homicide was arrested for federal firearms laws violations, numerous search warrants were executed, and an ongoing grand jury investigation is being conducted.

The CEASEFIRE strategy draws upon ATF's expertise in the investigation of Federal firearms violations. ATF special agents, assigned to field offices across the country, are provided with the training and equipment necessary to conduct the most complete and difficult investigations. In addition, forensic laboratory personnel support these special agents by conducting toolmark examinations, serial number restoration, and link recovered projectile and cartridge cases. Also,

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firearms experts provide technical support in the identification of firearms.

In order to make effective and proficient use of technological advances, law enforcement must link technology with crime fighting endeavors. The major benefit and crux of the CEASEFIRE strategy is its ability to interconnect investigative resources involving firearms-related crimes for direct accessibility by Federal, State, local, and international law enforcement agencies. If the law enforcement community, most importantly at the State and local level, is to have a meaningful impact upon the violent crime problem, it is essential that successful partnerships are established.

In regard to caseless ammunition, caseless ammunition or combustible case ammunition is not new technology. The concept was developed during World War II.

True caseless ammunition utilizes propellant bonded directly to the base of the projectile. Combustible case ammunition uses a cartridge case molded from a propellant type material.

This cartridge case is then filled with an additional propellant.

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TO

96220073

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In both, true caseless ammunition and combustible case ammunition, there is no cartridge case ejected from the weapon after firing. The propellant and/or combustible case is completely burned during the firing of the weapon.

Combustible case ammunition has seen extremely limited use in commercially available small arms over the last several decades. At the present time, only one such firearm, capable of firing combustible case ammunition, is commercially marketed in the United States.

The lack of commercial success of caseless/combustible cartridge case ammunition is due to the fact that the ammunition is considerably more expensive than conventional ammunition, and combustible case ammunition is not compatible with a firearm designed for conventional metallic cartridge cases.

A firearm intended for use with caseless/combustible case ammunition must be specifically designed for this type of ammunition, and the weapon requires a more complex breech sealing mechanism than a conventional firearm.

In closing, I must add that throughout this century, law enforcement has enhanced its ability to solve crimes by

JUL-15-1994 17:04 FROM

TO

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utilizing various scientific and innovative investigative techniques. During the 20th century, criminal justice advancements have paralleled the Nation's scientific progressions. For example, call box communication was replaced by handheld single unit radios with direct access to patrol personnel; handwritten card files that filled rooms are now contained on computer disks that provide instant retrieval and storage; manual fingerprint identification that took days or weeks has become fully automated and now can be queried in minutes; and as previously mentioned, ballistic comparison has been modernized through the use of a laser and computer imaging system, greatly accelerating examinations.

The CEASEFIRE strategy was designed to incorporate technological advances with various skilled human resources in a concerted effort to reduce firearms-related crimes. Law enforcement should grasp the reality of this concept and follow it into the 21st century in order to effectively address the crime problems of the future.

At this time, we would like to present to you an actual demonstration of the Integrated Ballistics Identification System. Upon completion of the demonstration, I'll be happy to take any questions you may have.

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TO

96220073

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Thank you for the opportunity to express our views to you on
this very significant issue.

E X E C U T I V E O F F I C E O F T H E P R E S I D E N T

19-Jul-1994 04:39pm

TO: Ronald E. Jones

FROM: Mark J. Schwartz
 Office of Mgmt and Budget, HTF

SUBJECT: Treasury testimony

Everything is OK with the testimony. Chris' comment about having a demo, I think is a moot point, since the system is on its way up there as part of the tech fair anyway.

E X E C U T I V E O F F I C E O F T H E P R E S I D E N T

19-Jul-1994 11:01am

TO: Ronald E. Jones
TO: Mark J. Schwartz

FROM: Christopher N. Brown
 Office of Mgmt and Budget, EGSS

SUBJECT: Treasury Testimony

I really only had two comments on the Treasury testimony.

1) On page 4 and page 10, the sentence where they talk about this "facilitating and info superhighway" is kind of horse manure. I very much doubt this ATF system is facilitating the info highway in law enforcement. It, however, "could be an integral part of info superhighway..)

2) Last paragraph, I know ATF wants to promote their ceasefire/bulletproof technology, but a physical demonstration as part of testimony is going a little far. FBI would almost be obligated, if that was the case, to do the same with their technology. I don't know how all this testimony is interrelated with the law enforcement technology expo being held later this week, on the hill, but I would suggest keeping the demos for the expo and the testimony for the hearing.

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET
Washington, D.C. 20503

July 18, 1994

LEGISLATIVE REFERRAL MEMORANDUM

LRM #M-1659

TO: Legislative Liaison Officer -

TREASURY - Richard S. Carro - (202)622-1146 - 228 - *Committee*
ONDCP - Babette Hankey - (202)395-6739 - 257

FROM: JAMES J. JUKES (for) *JJ*
Assistant Director for Legislative Reference

OMB CONTACT: RONALD JONES (395-3386)
Secretary's line (for simple responses): 395-3454

SUBJECT: JUSTICE Proposed Testimony on Developments in
Firearms Technology (*TWO PIECES*)

DEADLINE: 4:00 PM July 19, 1994

COMMENTS: This testimony is for a hearing on firearms
technology on Thursday, July 21. Treasury is also testifying.

OMB requests the views of your agency on the above subject before
advising on its relationship to the program of the President, in
accordance with OMB Circular A-19.

Please advise us if this item will affect direct spending or
receipts for purposes of the the "Pay-As-You-Go" provisions of
Title XIII of the Omnibus Budget Reconciliation Act of 1990.

CC:

C. Brown - *OK*
M. Schwartz - *OK*
Tim Fain - *OK*
J. Cerda

*Cleared as amended
To Dennis Burke
7/19
RJ*

_____ Concur

_____ No objection

_____ No comment

_____ See proposed edits on pages _____

_____ Other: _____

_____ FAX RETURN of _____ pages, attached to this
_____ response sheet



Department of Justice

STATEMENT

OF

**DAVID G. BOYD
DIRECTOR OF SCIENCE AND TECHNOLOGY
NATIONAL INSTITUTE OF JUSTICE**

BEFORE

THE

**SUBCOMMITTEE ON CRIME AND CRIMINAL JUSTICE
COMMITTEE ON THE JUDICIARY
U.S. HOUSE OF REPRESENTATIVES**

CONCERNING

DEVELOPMENTS IN FIREARMS TECHNOLOGY

ON

JULY 21, 1994

Mister Chairman, Members of the Subcommittee:

Every year, more than 23,000 people - nearly half the total number killed in the entire Vietnam War - are murdered. More than 170,000 are raped, and more than 6 million are victims of assaults. At least thirteen million are victimized by property crimes while about 1.5 million victims of violent crime are treated by our health care systems. The total economic cost of crime in this country - in a single year - comes to a staggering \$70 billion!¹

It should come as no surprise then that the American public consistently ranks crime at the top of every list of serious threats facing the country.

Since 1968, investment in law enforcement and the criminal justice system has grown at roughly twice the rate of all other government spending, until as a nation, we now spend more than \$75 billion each year on the law enforcement and criminal justice systems.² At the same time, we spend another \$50 billion on private security agencies and untold amounts on often unsuccessful efforts to protect our homes and businesses.³

Yet, despite the incredible cost of law enforcement and the clear expressions of concern by citizens about the consequences to the public of crime, we have done little to modernize our primary crime-fighting instrument -- the nation's police. In fact, state and local police, who represent more than 95% of our nation's police personnel and handle well over 95% of the crime in this country, are still equipped much as was Wyatt Earp in the late 19th century.

Surely, America's highly sophisticated technology base can provide better alternatives and make our thin blue line more effective at the same time.

If we could reduce crime by only one percent, it would mean 230 fewer murders, more than 1,700 fewer rapes, 60,000 fewer assaults and at least 130,000 fewer property crimes. It would mean 15,000 fewer victims of crime burdening our already hard pressed health care systems, and it would mean a savings of at least \$700 million in economic costs -- savings that would be realized every year.

If we had available technologies which eliminated the need for high speed pursuits, what could it save our cities? New York City recently lost a judgment for injuries to an innocent child (struck by a motorcyclist being pursued by police) for over \$100 million -- more than 50 times the total annual research and development budget allocated to the National Institute of Justice for the development of technologies to address this very issue! Last year in California alone, there were more than 7,000 high speed pursuits, which resulted in more than 1,200 injuries. ~~Eighty-two percent of the injuries~~
~~to officers, while 18 percent to law enforcement~~
~~officers. Nationally, about 25 percent of high speed chases end in~~
~~injuries.~~⁴

If we could find a technology that would safely and effectively permit an alternative to incarceration for only 1% of our current prison population, it would save at least \$159 million

each year.⁵

If we had available tools to reduce the consequences of violence in confrontations between police and suspects, what could they save us? We have no certain way of knowing, but we do know that without them, nearly 300 suspects will be killed each year, despite the best efforts of police to avoid bloodshed, and more than 150 police officers will die in the line of duty.⁶

While there may be limits to the amount of improvement technology is capable of producing in the levels of crime, the promise of productivity improvements offered by technology is clear, the numbers are equally impressive and the need compelling. From 1970 to 1991, crimes per police officer increased more than 65%, a workload increase that is reflected in the rate at which crimes are now cleared.⁷ In 1991, only 21% of all reported property crimes - barely one fifth - were cleared within one year. While the numbers are better for violent crimes, they still aren't very promising: only 45% -- less than half -- of all violent crimes are cleared each year. ~~Since there are limits to the resources we can~~

~~bring to bear, we must find new, more effective ways to~~

~~improve~~ the productivity and effectiveness of policing is essential.

Unfortunately, our efforts to leverage technology to obtain those productivity improvements have hardly been reassuring. From 1985 to 1990, ~~total~~ Federal research and development investment increased 7.8% in inflation adjusted dollars. During the same period, crime

increased 31.4% while the number of criminals incarcerated rose by 60%. ~~At the same time, investment in research and development for~~

~~the law enforcement and criminal justice system decreased~~
~~significantly~~, as the problem got worse, we invested even less in building better tools and finding solutions.

Part of the problem is a perception that law enforcement already has access to advanced technologies. Because federal agencies have access to advanced technologies, we tend to assume the same tools are available at the local level. At the same time, television programs often suggest that police have lots of fancy technology they can deploy at appropriate times. Unfortunately, most of this equipment is unavailable to local law enforcement or is far less sophisticated or effective than portrayed. Even that technology which really exists is rarely available to any but the largest departments, and then is usually drawn from military equipment only marginally suited for law enforcement uses. Most technology in state or local law enforcement agencies is hand-me-down, generations old, technologically obsolescent military equipment (night vision devices, radio systems, etc.). And most of the technology developed for federal agencies is either classified, is concentrated primarily on automation or surveillance technologies, ~~and is available only in very small quantities~~. Very little has been developed with the patrol officer in mind.

In most state and local law enforcement agencies, the research and development operation - when there is one - is someone charged

with going through equipment catalogs to find modern, affordable equipment. Even among federal agencies, those offices referred to as research and development are almost entirely applications oriented activities, building or adapting one-of-a-kind surveillance devices tailored to the specific operational requirements of a single agency. What is missing is a genuine research and development effort focused specifically on law enforcement, corrections and public safety needs, ~~secret and~~ ~~state and local level~~. Such an effort is needed because military technologies, while well suited to reactive strategies, usually require significant adaptation to be made suitable for the kind of crime prevention strategies we want to see put in place.

Law enforcement research and development projects tend to be very small and progress very slow.⁸ At the national laboratories, where much of the work is being done, law enforcement projects are part time work, sandwiched in among the major, multimillion dollar projects. As a consequence, it is difficult to attract high-powered talent and it is even harder to develop the critical mass required to make significant breakthroughs. At the same time, the market is extraordinarily fragmented. More than 90% of the roughly 17,360 law enforcement agencies in the United States employ 30 or fewer sworn officers and most departments make all purchases independently.

This fragmentation discourages the entry of major industry into the field, yet the potential market is very large. Police and Sheriffs' departments collectively employ nearly 840,000, while

corrections agencies employ approximately 400,000. The private security industry is the real heavyweight in terms of employment, with more than 1.5 million, while fire and rescue agencies - which could use much of the technology needed by law enforcement - account for another 340,000 employees. These numbers are large enough to support vibrant markets, but - unfortunately - are not large enough to support much research and development overhead.⁹ That's what the Attorney General meant when she pointed out that "we've discovered that industry is finding that doing business successfully with law enforcement, with thousands of different agencies, is much different and much more difficult than dealing with the Department of Defense and its single set of procurement regulations. At the same time, we know it is difficult for individual law enforcement agencies to find the information they need to help them locate and purchase new technologies. The National Institute of Justice is helping resolve these issues by initiating a Technology Center which will be part of a new law enforcement information network that will make it easier for law enforcement to find useful products and assist industry in identifying law enforcement requirements."¹⁰

Why do we dwell on these numbers? Because supporting the smaller agencies - over 90% of all our law enforcement agencies - is the crucial challenge. The truth is that 95% of all law enforcement manpower is state and local and the vast bulk of what

we consider policing falls within local jurisdictions. Federal agencies are rarely the first on the scene for those problems the average citizen is most concerned about - domestic disturbances, assaults, murders, gang brawls, drive-by shootings, burglaries, carjackings, robberies and the like. While federal agencies are involved in a dozen or so hostage/barricade or barricade operations each year, the New York City police alone are called out to confront this kind of problem several hundred times each year! The corrections picture is not much different. Over 90% of prison inmates - and all jail inmates - are held in state and local facilities.¹¹ In fact, the largest federal facilities - which rarely house more than 2,000 prisoners are dwarfed by the Los Angeles County Jail which houses over 20,000! If we want to have an impact on crime, we'll have to support law enforcement at the state and local level by helping to provide technological "force multipliers". That's why most of the Attorney General's interests and this administration's anticrime initiatives have to do with strengthening state and local law enforcement, ~~and that is the~~

~~prompted the Vice President to debate the best way to~~
~~to find the balance between the most advanced technology and the best~~
~~way to place it at the disposal of police officers and other law~~
~~enforcement officers throughout this country.~~

There obviously is no one-to-one relationship between investments in technology and reductions in crime or improvements in police

productivity. But law enforcement is probably the one area where the greatest gains from technology can be realized - not because law enforcement is particularly responsive to technology, but because so little has been invested in bringing technology to state and local law enforcement. Examples of what can be accomplished with limited resources and accurate identification of law enforcement requirements include:

~~The introduction of soft body armor by the various
institute of justice, this technology developed as an
investment of barely \$5 million has already saved over~~

soft body armor
\$6M

~~lives~~ lives at an estimated savings in survivor's benefits and replacement costs of more than \$1 million per officer saved (for a total of more than \$1.6 billion), and resulted in the creation of an international industry dominated by the United States¹²;

A revolutionary new fingerprinting device which was conceived, developed, tested, transferred to industry and commercialized in barely 18 months with a research and development investment of less than \$100,000;

fingerprinting
device

An automated booking system implemented recently by the Drug Enforcement Administration ~~capable of reducing~~ booking time from 75 to 15 minutes - a savings of 80% for that single function;

automated booking
system.

The development of standard reference materials for DNA

identification, a project which was recognized by Research and Development Magazine as one of the 100 best research and development projects of 1993; and

- The development of standards material for polymerase chain reaction -- a newer, faster and cheaper method of DNA identification -- which will soon be ready for field use.

At the same time, intelligent planning for major federal systems and extensive cooperation among state and federal law enforcement has also resulted in major technology payoffs for state and local government, including:

- The recently completed FBI Engineering Research Facility, ^{FBI Engineering Research Facility} which provides a superb capability for the development, custom modification and operational testing of high technology equipment; and
- The National Crime Information Center (NCIC), which currently handles over one million transactions per day for federal, state and local law enforcement agencies.

Paradoxically, it is in law enforcement - probably the most poorly funded area of research and development - that technology transfer is the most promising and can probably pay the greatest and most immediate dividends. The potential for payoffs in technology - at the patrol officer level - are nearly unlimited. Is it, for example, possible for technology to make stolen weapons unusable or prevent the deaths each year of hundreds of children in

firearms accidents?¹³ Representative of incidents in which police officers are killed with their own weapons was a bizarre gun battle last month in a crowded hospital clinic in Brooklyn, New York. Two corrections officers had taken a prison inmate to the clinic for treatment. When restraints were removed so the prisoner could be treated, he snatched one of the guard's revolvers and critically wounded the other guard. As the prisoner raced away, he grabbed a 7-year old boy. Edna Grajales, the corrections officer whose weapon was taken, then grabbed her partner's gun, pursued and killed the prisoner. A smart gun would have saved a life, prevented an officer from being critically wounded, and saved a young mother and child from a traumatic experience.

Can we find better ways of tracking suspects? Can we tell what is in a fleeing felon's car, or in a suspect's house? Can we find a face or an armed subject in a crowd? Can we detect an armed student or other persons entering a school? Can we produce small, easy-to-use, inexpensive explosive sniffers or chemical detection equipment? Can we, without injury to the suspect, any hostage or innocent bystanders, subdue a suspect in a hostage/barricade situation or domestic disturbance; a fleeing vehicle or on foot¹⁴; a one-on-one confrontation with an armed but deranged subject; a carjacking; or a resisted search or drug raid? Can we develop safer methods of extracting an uncooperative prisoner from his cell?¹⁵ Can we provide safer, more effective and socially acceptable ways to control unruly crowds or quell riots? Can we provide better, more

sophisticated training for law enforcement personnel at all levels, from officer to chief?

In contrast with the Department of Defense, there is no federal level agency driving the development, manufacture or acquisition of specialized law enforcement equipment. In fact, law enforcement equipment purchases are made by the members of an intensely fragmented market. As a consequence, this market - with nearly 3 million potential individual customers - is large enough to sustain an industry, but too small to support the research and development base needed to create the new products it needs.¹⁶ In fact, there are virtually no products developed exclusively for law enforcement use (with the possible exception of ~~5307 body armor~~, handcuffs and batons).¹⁷

Until recently, the role of the National Institute of Justice has been primarily one of funding the development of promising technologies in a few key areas. Only in the past three years has it also become one of identifying existing technologies (especially in the Defense and Intelligence communities), encouraging promising new concepts and facilitating the transfer of already developed technologies to law enforcement use.

By late 1992 and early 1993 a series of grants, cooperative agreements and interagency agreements had been initiated by NIJ in an effort to form a broad based technology identification, development and transfer program which has focused from the beginning on the practical needs of the user community. State and

local law enforcement, as well as corrections departments and other users have been and continue to be included as the essential components of the NIJ technology team. To ensure that policy and human factors issues are properly addressed in the collection and analysis of background data on use of force by law enforcement personnel, and to ensure that these issues are properly represented in considering technology development for law enforcement, social scientists and criminal justice researchers are also included as part of the NIJ ~~technology~~ team.

Since funding for the development of technologies for law enforcement is severely limited, NIJ ~~has been~~ working to leverage research and development efforts by industry and other federal agencies. To start the search for new technologies NIJ turned to the vast technical expertise that exists within the Department of Energy National Laboratories, particularly in the special technologies programs at the facilities charged with development of technology for intelligence gathering and the safeguarding of nuclear materials. At the same time, NIJ began aggressive efforts to identify military and intelligence community technologies that may be candidates for dual use under the Administration's Defense Technology Reinvestment Initiative announced early in 1993.

Spearheading the effort is a distinguished panel established under a National Institute of Justice cooperative agreement which has been charged with establishing links essential to identifying

and transferring dual use technologies. Directed by Vice Admiral (retired) E.A. Burkhalter, Jr., the panel includes Judge William Webster, former Director of the FBI and CIA; Dr. Ruth Davis, former Assistant Secretary of Energy; General (retired) Paul Gorman; Mayor Kurt Schmoke of Baltimore; Jim Falk, former White House Counsel; Ray Havens, Deputy Director of the U.S. Marshal's Service; and a number of active federal officials from the Department of Defense, Intelligence Community Management Staff, and the Department of Justice.

Tying it all together is the Technology Assessment Program Advisory Council (TAPAC), funded by a cooperative agreement from NIJ and chaired by Chief Harlin McEwen of Ithaca, New York. This council is made up of more than 80 senior state, local and federal law enforcement officials from the United States and Canada. TAPAC reviews technology efforts on behalf of law enforcement to ensure they are well grounded in the very real world of the police officer.

At the same time, through existing grants and cooperative agreements, we have started a major effort to identify what it will take to get new technologies introduced to the community by creating two other groups: a liability task group and a community acceptance panel.

The Liability Task Group is constituted of private, municipal and law enforcement attorneys, retired judges, and law school faculty and students. This task force is charged with identifying

liability issues and recommending efforts law enforcement agencies should undertake to address them, both before and after new technologies are introduced.

The Community Acceptance Panel is key to getting any technology into the field. It is made up of a wide range of community groups and is charged with helping to identify "show stopper" community issues that might surround a newly developed or developing technology. Included in this panel are representatives from the ACLU, NAACP, Handgun Control International, the League of Women Voters, the National Rifle Association, police review boards, academics, a police chief and other interested community groups.

Although the NIJ technology transfer program, initiated by the Attorney General's letters to the Secretary of Defense and Director of Central Intelligence, is ~~2 1/2~~ a year old,¹⁸ it has already produced:

A prototype rear seat airbag to safely restrain uncooperative prisoners in the back seats of police cars which we believe it will be possible to manufacture and sell at a cost no greater than that of the best current restraint seat;

Rear seat
Airbag

A prototype barrier strip which can deflate tires safely and which we expect will sell at about one quarter of the cost of current strips, while offering more capability and substantially greater safety than existing methods.

Barrier Strip to
Deflate Tires

- A breadboard velocity-adjusting weapon which will allow rubber bullets or other safe projectiles to be fired without causing injury at any distance; *Velocity Adjusting Weapon.*
- The development of teams at each of the five national laboratories involved in NIJ projects, made up of scientists, local police and corrections officials and social scientists working to develop practical and affordable less than lethal technologies.
- At the request of the law enforcement community and with the assistance of the Southern California Chapter of the American Civil Liberties Union, ~~the~~ comprehensive studies of the safety and effectiveness of the pepper spray that is increasingly being used by law enforcement. As a byproduct of this effort, which was completed only recently, we have identified positional asphyxia as the cause of an estimated 80% of all in-custody deaths and - with the assistance of the International Association of Chiefs of Police - have provided Police and Sheriffs departments with information on how to prevent positional asphyxia deaths.

⇒ In addition, the National Institute of Justice has initiated projects to:

- Develop a weapon that can be fired only by its owner to *own*/weapon protect police officers and make handguns in the home

safer. In the last 10 years, at least one in seven officers killed with a firearm has been killed with his own gun, while hundreds of children are killed accidentally each year with improperly secured weapons; [REDACTED]

- Develop safe ways to stop cars in certain situations; Stop cars
- Develop disorienting or dazzling light systems with Disorienting light protective eyewear for police;
- Identify anesthetic compounds with very high safety margins and develop effective ways to simultaneously deliver both the compounds and the antidotes to dramatically increase safety;
- Develop synthetic compounds that can be used to identify fingerprints on particularly difficult surfaces;
- Insure the efficiency of DNA identification by developing massively parallel electrophoresis to provide tools to allow the rapid processing of large numbers of samples;
- Develop better technologies for the identification of trace evidence;
- Put key reference materials developed by the National Institute of Justice and essential to crime laboratories and investigative agencies on digital media, such as CD ROMs;
- Develop, publish and - in some cases - administer standards for key law enforcement equipment such as soft body armor,

DNA identification technologies, handguns, handcuffs, police car packages and other equipment; and

- Publish materials to provide law enforcement agencies information on new technologies.

Shortly after the Attorney General wrote to the Secretary of Defense in June, 1993, asking for assistance in identifying technologies - both less than lethal and general technologies - with potential for declassification and transfer to or dual use by law enforcement, representatives of the National Institute of Justice met with representatives of the Office of the Director of Defense Research and Engineering. Early in December, the Advanced Research Projects Agency provided ~~the list of technologies being considered for development as part of an operations other than war program and asked us to identify law enforcement priorities of that list which they could consider integrating into the Army research and development plan. We took the list to our technology transfer advisory council and developed a list which~~
~~remained~~

First, a device capable of identifying handguns, which has much greater discriminating power than existing metal detectors. Probable cause rules require that we know with a high level of certainty that a subject is carrying a gun - not just a piece of metal that might be a gun. This device is needed in three configurations: one capable of being placed unobtrusively in school entrances; one

capable of being mounted in and operated from a vehicle;
and a handheld or portable version that can be placed in
high-interest locations.

- Second, the whole range of less than lethal technologies,
but especially technologies capable of stopping cars
safely; and
- Third, a version of the personnel status monitor and remote
surgical system being considered for development for use by
military medical personnel which, ~~adapted for law~~
~~enforcement~~, would greatly strengthen the ability of
officers on foot to work in a genuine community policing
role, permit supervisors to observe and assist as needed,
and provide warning if an officer is in trouble (as well as
information on where he or she is). The vital signs and
locator monitors could also be used to provide far more
robust and potentially less expensive electronic
incarceration systems, while the vital signs monitor could
help alert officers when a prisoner in custody is
experiencing life-threatening physical problems. ~~123~~

~~Recently initiated steps to begin with the development of~~

~~defense in this process defense will invest about \$1~~

~~million, and plans to invest \$700,000~~

On March 22, 1994, the Research and Technology Subcommittee of
the House Armed Services Committee convened hearings to examine our
progress in implementing an effective partnership with the

Department of Defense. One month later, Vice President Al Gore brought together Attorney General Janet Reno, Secretary of the Treasury Lloyd Bentsen, and Deputy Secretary of Defense John Deutch to see several advanced technologies developed for law enforcement use and to sign two major Memoranda of Understanding. One was between Justice and Treasury and establishes a new Federal Law Enforcement Wireless Users Group to tackle electronic communications and data transfer interoperability problems among federal law enforcement agencies. The other - between Defense and Justice - established a new Joint Program Steering Group to be manned jointly by Defense and Justice Department personnel. This group will help to identify, develop and transfer to law enforcement useful defense technologies.

It may also be that our law enforcement experience can help build better tools for military use in peacekeeping operations, especially as peacekeeping operations increasingly resemble law enforcement. As we develop solutions, our considerable experience with the difficult issues that the military is increasingly encountering may help strengthen their capabilities.

But while we share many needs, we have to remain conscious of the very real differences. As the Attorney General told her military audience:

"Let me emphasize some differences that, coming from a Defense background, you may not be used to, but which are critical to understanding how you can help law enforcement.

"Your standard for nonlethal technologies is generally one of minimizing collateral damage; our standard is the elimination of any collateral damage.

"When less than lethal technologies are used by law enforcement, remember that they're not being used against an enemy; they're being used to help protect fellow Citizens. When police use these devices, they must be constrained by the knowledge that the people they are restraining aren't enemies; they are fellow citizens, with a full set of civil rights.

"In the military, the mission comes first, even if it means sometimes sacrificing the safety of bystanders. For the officer, it is the safety of those bystanders that is paramount."¹⁹

~~While our partnership with the Department of Defense is important~~
~~because it~~ provides, for the first time, a formal law enforcement voice in the federal research and development apparatus, ~~it is~~ ~~limited to those technologies which meet defense needs only.~~ More than a seat on a single working group is needed if we are to succeed in leapfrogging U.S. Law enforcement from a dependence on weapons available in Wyatt Earp's time into the 21st century. There are at least six major elements that should be undertaken to ensure that programs to transfer technology to law enforcement are more effective and more lasting than past efforts.

First, we will have to draw attention to the advantages technology can offer to law enforcement, because - while virtually

no money has been invested in developing effective technologies specifically for law enforcement, it is also true that law enforcement has not readily embraced technology. Instead, ~~these~~ budget increases have almost invariably been committed not to tools to make the department more efficient, but to additional manpower. The result is that 97% or more of law enforcement budgets are invested in manpower. While there is no substitute for an officer on the beat, public budgets are simply too tight to allow us the luxury of expanding our police departments indefinitely. Technology offers the only viable solution.

For example, the 80% savings realized by the drug enforcement administration's automated booking system translates into an hour saved for every booking operation. At that rate, every 1700 bookings would be roughly equal to one full man year of savings. In new york city alone, savings on that scale would mean - with nearly 250,000 arrests annually - a savings equivalent to putting an additional 147 officers on the streets. Nationally, it could mean the equivalent of more than 8,500 officers.²⁰ And, fully implemented, the system would allow better records, better support to prosecutors, and fewer mistakes. More importantly, with a moderate level of national emphasis ~~and more emphasis on the~~ ~~implementation of a national information architecture~~, it could provide for a standardized booking system which could - in turn -

prevent an arresting jurisdiction from releasing a suspect they were unaware was wanted by another agency in another state. Other technologies offer at least as much promise, if only we are willing to take advantage of them. We're going to realize those savings at the federal level because steps are being taken to expand the system to support the U.S. Marshal's service and the border patrol.

Yet, ironically, this new system typifies some of the largest shortcomings in the way we support state and local law enforcement. There are, currently, several proposals before Congress which aim at improving the automation capabilities of state and local agencies. Unfortunately, there are no provisions in any of those bills to require that equipment funded by the federal government complies with standards designed to ensure compatibility of those systems with national systems currently being developed. Unless we establish requirements to ensure that compatibility we may - with the best of intentions - wind up repeating the mistakes of past years by providing equipment which may be made obsolete even as we fund its purchase, thus delaying further our ability to establish the sort of networks we will need to most efficiently catch criminals or perform background checks.

Second, we need to identify a principal focus for law enforcement technology efforts, to coordinate the development of new technologies, eliminate duplication and ensure law enforcement involvement so we avoid the costly mistakes made too often in other

federal research and development efforts.

One of our major concerns is in husbanding our limited resources by ensuring we don't waste money in duplicative efforts. About a year ago, when we first started to inventory what was in the field and what was being developed, we stumbled across several cases where different agencies were working on the same problem, but didn't know about each other. Determined to fix that problem, the Attorney General directed NIJ to ~~develop a mechanism~~ to ensure that we were sharing information about what we were doing. That way, we could jointly identify the most promising projects and concentrate resources on them, rather than conducting lots of little efforts to solve the same problems. Doing this allows us to capitalize on successes already made. But we can do that only if we rely on intelligently structured partnerships which allow us to share information and pool resources.

While both the military and law enforcement need many of the same technologies, the differences in the structure of these two communities, coupled with tightly constrained budgets at the state and local levels have forced us to follow a somewhat different requirements and development process than the military is used to. We didn't even have a clear idea what technology was already in the field, so we had to start with a series of surveys. Then we relied on the various program activities previously mentioned, as well as seminars, conferences, and workshops to develop a list of what law

enforcement thinks it needs, and began exposing the law enforcement community to some of the technologies available in the military and intelligence communities on the theory that no one ever had a requirement for a telephone until he knew what a telephone was. Then we reassessed what they needed and began crawling through the federal research and development agencies and meeting with industry. We will continue this process as we expand our understanding of law enforcement requirements and of the potential of technologies already developed.

Third, we need to create a mechanism to ease access to technological information by public safety agencies. One particularly efficient way to do this is through the technology center mentioned by the Attorney General. Such a center would be able to consolidate information and provide it to law enforcement. For most law enforcement agencies, it is very costly to devote an officer's precious time to finding technology-related information, and is even more difficult to locate specialized technologies to meet key needs. The technology center can:

- Build on existing information networks and services by providing a gateway to law enforcement technical information so agencies can get answers with a single telephone call. The center can answer many questions directly, but can also maintain lists of key sources and points of contact that agencies could be referred to for

further information. Such a capability can add to the usefulness of existing services, such as the Regional Information Sharing System (RISS) and the FBI Engineering Research Laboratory in Quantico, and greatly increase access to technical information for smaller law enforcement agencies;

Maintain consumer information for law enforcement equipment. Since testing of all law enforcement equipment by each local police department is far too expensive to be practical, the center can maintain lists of equipment purchased by agencies throughout the United States. Agencies calling about specific products can then be referred to departments with actual experience with the product. There is no current source of such information for law enforcement.

Increase the usefulness of very high cost/low use equipment. Extraordinarily capable high technology equipment with potential applications in law enforcement exists in a number of places, but access to the equipment - or even knowledge of its existence - is rare. Where feasible, the center can help coordinate the use of some of that equipment and greatly enhance its value to the taxpayer.

Develop a mechanism for the gathering of information on

what technologies law enforcement and corrections agencies actually need so they can be passed on to scientists and industry. Historically, the identification of law enforcement "needs" has been a task undertaken without law enforcement input. More often than not, one or more technologists - often with the sketchiest understanding of law enforcement operations - have simply assembled lists of interesting technologies which have been too expensive, too complicated, and too unrelated to the realities of law enforcement, and especially to the liability problems posed by new technologies.

NIJ is working now to find innovative - and affordable - ways to expand the responsibilities of the existing Technology Assessment Program Information Center (TAPIC) so it can undertake these tasks.

Fourth, we should build on the emerging DOD/DOJ Joint Steering Group to establish a way to insure public safety needs are always taken into account in the earliest stages of every federal research and development effort. For example, the U.S. Army is currently developing simulation technologies which will allow the creation of inexpensive platforms for training individuals. The Army National Guard, for example, has a critical requirement for simulators for training since they lack the training space and equipment available to active units. If new simulators are designed from the beginning

to include public safety training requirements, then every national guard armory with the equipment will also have available a trainer useful for local police, fire, and rescue departments, and - instead of being useful one weekend a month - the equipment can be useful nearly every day.

And it's not just the Army that has capabilities that can be used to support law enforcement. Naval In-Service Engineering - East (NISE-E) in South Carolina has available to it a modern brig which could provide an ideal platform for testing technologies suitable for use in corrections facilities. We are currently exploring opportunities for joint projects with that center.

There is probably no single area where a partnership between Defense and law enforcement can pay dividends as great as those that are possible through the joint development of simulation technologies.

Fifth, it is essential that we establish a process to ensure the safety of law enforcement technologies, both for the public and the officer. There is no current mechanism in the United States for the systematic monitoring of the safety of newly introduced law enforcement equipment. Pepper spray, for example, became the most widely used less than lethal technology in the United States over a period of barely three years. At the same time, it became so popular among private citizens seeking self-defense alternatives to handguns that we estimate 90% of all pepper spray sold in the

united states is sold to private citizens. Yet all this happened without the benefit of a single, comprehensive safety study! It was only in June, 1993 that a series of scientific studies were undertaken by NIJ to determine whether pepper spray was as effective as claimed and as safe as a law enforcement technology should be. We initiated a major study with the Baltimore County Police Department and began an intensive effort to collect data on any fatalities which occurred during incidents in which pepper spray was used. We are continuing those efforts, but have already begun to provide law enforcement and the public essential safety information in the form of user guides and medical reports, and are using pepper spray as a model for the development of a mechanism for monitoring the safety of other technologies employed by law enforcement.

And finally, we must address the fragmented buying power of law enforcement. With the possible exception of communications equipment vendors, the fragmentation of the market makes it difficult to interest companies large enough to bring the advantages of economies of scale to law enforcement markets. The result is that local agencies are sometimes the victims of less than competent and sometimes even unscrupulous producers and vendors. There is, for example, no manufacturer that builds a car designed specifically for police. We have specially designed postal and ups trucks, but police departments lack the concentrated buying

power to interest manufacturers in producing specially designed cars for police. In fact, police buying power is so limited that the police were unsuccessful even in persuading manufacturers to seek a waiver from the national highway traffic safety administration which would allow them to produce cars without the passenger side airbag for police. The right side airbag is forcing many agencies to completely re-engineer the placement of police equipment in their cars.²¹ a buying consortium would not only ensure a market attractive to law enforcement, but could also dramatically reduce the prices of most law enforcement equipment. Properly developed, such a consortium could promote competition among suppliers by developing the equivalent of a GSA catalog for suitable equipment. Critical to the success of such a mechanism, however, would be the direct and detailed involvement of law enforcement at every level, from local to federal, to insure that decisions were driven by real needs and that products were acceptable to the officers who have to use them.

We know Technology can't fix every shortcoming. We know it can't make up for poor judgment or compensate for inadequate or nonexistent training. It can't fix the problems that result from poor officer screening or selection and it can never replace competent leadership. But it can provide tools to increase options, make the police officer's job easier, increase the effectiveness of law enforcement, enhance productivity in law

enforcement by reducing administrative overhead and improving responsiveness, limit the consequences of poor judgment and improve the safety of the police and the public. Technology can save lives.

With the drawdown of defense spending and a greatly enhanced focus on technology transfer by the Defense, Commerce and Energy Departments and the intelligence community to pressing national social needs, we have an extraordinary window of opportunity to leapfrog law enforcement well into the 21st century. More cops on the beat along with community policing are essential elements of any effective strategy, but equally important is the development of new technologies that will provide law enforcement officers with tools that will allow them to meet the complex challenges of daily policing in a safe and effective manner. Our partnership with the Defense Department is a first crucial step in addressing the shortfalls in investment in law enforcement research and development.

I would be pleased to answer any questions the subcommittee may have.

References

1. Violent Crime in America, International Association of Chiefs of Police, April 27, 1993. The December 13, 1993 issue of Business Week estimates that crime poses at least \$270 billion in costs in the form of property losses, urban decay, medical expenses, and shattered lives.

2. Justice Expenditure and Employment, 1990, Bureau of Justice Statistics, U.S. Department of Justice. Business Week and U.S. News and World Report articles published in the last few months put the costs, both direct and indirect, from 20% to 100% higher.

3. Private Security: Patterns and Trends, National Institute of Justice, U.S. Department of Justice, August, 1991.

4. Geoffrey p. Alpert, "Police Pursuit and the Use of Excessive Force", unpublished, and "Chief Tim Grimmond, "Police Pursuits," Police Chief, July, 1992, pp. 43-47. Studies have produced fatality estimates ranging from about .38% to 3% of pursuits.

5. At the end of 1990, we were holding 883,593 federal and state prisoners at an annual average cost of more than \$18,000 per inmate, exclusive of the cost of the prison itself. Not included are another 444,584 in jails, many for terms greater than six months. Prisoners in 1992, Bureau of Justice Statistics, U.S. Department of Justice, May, 1993.

6. Uniform Crime Reports: Crime in the United States, 1970 through 1991, Federal Bureau of Investigation.

7. The sources for police workload levels and crime clearance rates are the Uniform Crime Reports published annually by the Federal Bureau of Investigation. Under the FBI's Uniform Crime Reports definition, a crime is generally considered cleared when someone is arrested, charged and turned over to the court for prosecution.

8. Few law enforcement technology projects are funded at more than \$200,000 per year.

9. Census of State and Local Law Enforcement Agencies, 1992, Bureau of Justice Statistics, U.S. Department of Justice, July, 1993.

10. The Honorable Janet Reno, Non-lethal Defense Seminar at Johns Hopkins University, November 17, 1993.

11. Prisoners in 1992, Bureau of Statistics, U.S. Department of Justice, May, 1993.

12. Dupont Kevlar™ Survivor's Club

13. Congresswoman Patricia Schroeder inserted committee language in the 1994 Defense Budget Authorization directing the Advanced Research Projects Agency (ARPA), in coordination with the National Institute of Justice, to initiate the development of safe gun. Her interest in the project resulted from a recognition that hundreds of children are killed each year playing with a parent's weapon. At the same time, there are estimates that - over the past 20 years - from one in seven to one in four police officers killed each year with a firearm is killed with his own weapon. This project will

use existing technologies to develop a reliable weapon which can be fired only by its owner.

14. The National Institute of Justice is initiating a project to create a device which will permit police to lay a fleeing car - while it is in motion - so that it can be tracked without a police pursuit.

15. Four corrections officers were seriously injured - one nearly killed - in New Mexico in August, 1993, as they tried to remove an uncooperative prisoner from his cell.

16. Much law enforcement equipment is directly usable in several related areas. The market therefore includes at least 840,000 employees of police agencies, 1.5 million private security employees, 400,000 corrections employees and 340,000 fire department employees. Data is taken from Bureau of Justice statistics, National Institute of Justice and Bureau of the Census Reports.

17. Even pepper spray is available to law enforcement at affordable prices in large measure because nearly 90% of the product is sold to private citizens for personal protection.

18. In 1989, Congress directed NIJ to develop a prototype less than lethal device. In 1992, responding to major findings from these earlier efforts, NIJ established a more comprehensive, integrated program to develop and deploy several devices to meet a variety of less than lethal requirements. Since the effort to develop this device inevitably resulted in the identification of

other technologies of value to law enforcement, a parallel technology transfer program was also initiated to facilitate the transfer of more general technologies to law enforcement.

19. Reno, november 17, 1993.

20. These calculations are based on only the roughly 10,000 agencies included in the FBI's Uniform Crime Report. There are more than 17,000 agencies nationwide. A single system is capable of 35,040 bookings per year (at 15 minutes per booking), for a potential savings of 20 man years per machine. Even if the machines performed at only one tenth that level, each system would be worth nearly ten times its cost in manpower savings in the first year alone (based on a cost per system of about \$20,000).

21. Car manufacturers produce police car "packages", which are essentially assembly line cars with different paint (if the department can afford it), special lighting packages, beefed up transmissions, suspensions and engines (in some cases), And other accessories. The right side airbag makes mounting radar guns or other equipment on the passenger side of the dash dangerous to the officer driving, even when the right seat is seldom, if ever, used for passengers.

DRAFT: 7/18/94 at 2:00 p.m.

Statement before the
House Committee on the Judiciary
Subcommittee on Crime and Criminal Justice

July 21, 1994

By

Milton E. Ahlerich
Assistant Director
FBI Laboratory

On a Fall evening in 1992, a Washington, D. C., cab driver was shot and killed in a holdup. Hours later, two men were arrested in Montgomery County, Maryland, after a failed armed carjacking attempt in the Silver Spring Metro station parking lot. Previously, these two cases would have been investigated by police officers reporting to the crime scenes -- and the fact that the same gun was used in both shootings would have gone undetected. Because the crime laboratories serving these two jurisdictions both participate in the FBI's DRUGFIRE program, however, evidence from these cases was linked and the suspects were held responsible for the murder they committed in D.C.

In Baltimore, DRUGFIRE linked a series of four non-fatal shootings in three different police districts, establishing that the same gun was used in all cases. A suspect was identified when a semi-automatic pistol was recovered by police in a traffic stop, and test-fired ammunition was matched by DRUGFIRE.

Last November, in Los Angeles, the carjack killing of an 11-year old boy -- the investigation of which had stalled without a suspect -- was linked by DRUGFIRE to an ambush attack on two L.A. police officers. The suspects in the ambush now have to answer for the murder of a child.

These are just three of the more than 200 linkages that have been established by DRUGFIRE since it was first installed in the Baltimore/Washington area in July 1992. Each time DRUGFIRE links two or more cases that were not otherwise known to be related, another success story like these can be told. Almost every day now, one of the seven crime laboratories serving the Baltimore/Washington area or the eight labs in Southern California, where DRUGFIRE was installed last Fall, uses DRUGFIRE to link two or more shooting incidents, providing police with leads that help focus investigations or identify suspects.

The DRUGFIRE program was initiated in 1989 as part of the FBI's response to the call from the head of the Office of National Drug Control Policy for an emergency action plan to help Washington, D.C.'s police cope with the rising tide of drug-related violence, especially street crimes involving handguns. The name, DRUGFIRE, reflects the FBI's focus on linking firearms evidence from drug-related crimes.

The concepts underlying DRUGFIRE are simple. First, use the experience of the FBI Laboratory's firearms examiners as the foundation for working with state and local crime laboratories to build and operate a computer database network linking serial

shootings and identifying suspects when guns are recovered. Second, make the system so it can automatically compare firearms evidence received in a single crime laboratory, while allowing any lab to quickly compare and exchange investigative data with other law enforcement agencies -- whether across town or across the country. Third, design the system to run on a low-cost computer that states can afford to buy themselves, and provide, free of charge, the software, training and technical support needed for forensic firearms laboratories to operate independently of the FBI. Finally, listen to users to understand how DRUGFIRE is working, and how it can be improved to better support federal, state and local law enforcement.

The FBI believes DRUGFIRE is well-suited to the Administration's initiative to work in partnership with states to fight violent crime by using modern technology to make more efficient use of scarce investigative resources. Having demonstrated the clear success of DRUGFIRE in Baltimore/Washington and Southern California, the FBI can now work with other firearms laboratories throughout the United States to form a national computer network of forensic firearms laboratories.

For our part, the FBI takes responsibility and bears the expense for developing and testing DRUGFIRE in cooperation with the states. We provide DRUGFIRE software to state and local crime laboratories, together with installation, training, user support, and software upgrades, as they are developed. The states buy their own computer equipment to run the DRUGFIRE software, and provide

laboratory space and qualified personnel to operate the system. States also work with us to define and revise, as needed, the standard procedures and conventions needed to ensure that the data for firearms evidence stored in DRUGFIRE are compatible and exchangeable between firearms laboratories, regardless of location. That way, the strengths of both federal and state law enforcement are used to mutual advantage in countering the plague of gun-related street crime.

In addition to the 15 crime laboratories where DRUGFIRE is currently installed in the Baltimore/Washington and Southern California areas, the FBI has committed to installing DRUGFIRE in 28 additional laboratories by the end of Fiscal Year 1995, including Atlanta (1), Chicago (3), Florida (8), Indiana (5), New York (8), and Ohio (3). As a result, by this time next year we plan to have DRUGFIRE installed in over a quarter of the state and local crime laboratories which conduct firearms evidence examinations. Several other states have expressed interest in receiving DRUGFIRE and, as a result, we anticipate that another 30-40 sites will be installed in FY 1996.

The FBI Laboratory does not envision DRUGFIRE becoming a national database that centrally stores investigative information for all firearms cases. Rather, we see DRUGFIRE as a national network of firearms labs, clustered together by state or other regional groupings, which can exchange images and investigative information with adjacent or distant DRUGFIRE clusters. Within the next year, we plan to test this concept in two places (i.e.,

Georgia-Florida and Illinois-Indiana-Ohio) by establishing high-speed, inter-city communication links connecting the hub sites in each state. Data communications between DRUGFIRE clusters will provide the final building block needed to make DRUGFIRE a truly national crime-fighting tool -- allowing the approximately 150 firearms laboratories in the United States to exchange investigative information from firearms-related cases. As a bonus for firearms examiners in state and local crime laboratories, the same computer that runs DRUGFIRE is being adapted to provide an image database -- that is, an illustrated encyclopedia -- of firearms and ammunition exemplars from the FBI Laboratory's Reference Firearms Collection and Standard Ammunition File, both the largest and most comprehensive forensic collections in the world. The images are stored on CD-ROM as a local add-on to the DRUGFIRE workstation. When this expanded capability is available, beginning next year, DRUGFIRE users will have full access to the FBI's world-class reference collections to assist in identifying firearms evidence.

Standards for classifying and exchanging investigative information regarding firearms evidence are the glue holding the DRUGFIRE user community together. The FBI Laboratory works directly with other federal, state and local crime laboratories to establish and maintain standards for most forensic disciplines as part of our mandate -- established in U.S. Title 28, Code of Federal Regulations, Section 0.85(g) -- to provide scientific and technical assistance, free of charge, to all law enforcement

agencies.

The most recent example of the FBI's standards-setting role may be seen in our sponsorship of the Technical Working Group on DNA Analysis Methods which worked with DNA experts from state and local laboratories to issue quality assurance and proficiency testing standards for forensic DNA analysis. The DNA Identification Act, which is part of both the House and Senate versions of the Crime Bill, formally establishes the FBI's standards-setting role for DNA testing. In our management of the DRUGFIRE program, the FBI is playing a similar, parallel role in promulgating national standards for firearms identification, working with all federal, state, and local firearms laboratories as a facilitator in reaching consensus standards for the operation of DRUGFIRE, and the exchange of investigative information between and among law enforcement agencies.

DRUGFIRE exemplifies how the FBI Laboratory, as the only national, full-service crime laboratory, is uniquely positioned to develop new forensic technology that can be put to immediate use by all crime laboratories to help fight the scourge of gun-related violence. The DRUGFIRE program is a major FBI initiative to foster a true partnership with other federal, state and local law enforcement agencies. We are anxious to implement this proven, low-cost capability so that American society can benefit directly from our technical expertise as soon as possible.

ONE HUNDRED THIRD CONGRESS

Congress of the United States

House of Representatives

COMMITTEE ON THE JUDICIARY

2138 RAYBURN HOUSE OFFICE BUILDING

WASHINGTON, DC 20515-6218

July 7, 1994

Honorable Janet Reno
 Attorney General
 U.S. Department of Justice
 10th and Constitution Ave. NW
 Washington, DC 20530

Dear Attorney General Reno:

I am writing to informally invite a member of your staff to testify at a hearing of the House Judiciary Committee, Subcommittee on Crime and Criminal Justice, on new developments in technology related to firearms. I understand that Mr. David Boyd, Director, Science and Technology Division, National Institute of Justice, would be an especially knowledgeable representative.

A formal invitation will follow shortly from Chairman Brooks. But I wanted you to have this advance notice so that your representative can adequately prepare testimony. The hearing is scheduled for 10:00 a.m. on July 21, 1994 in room 2237, Rayburn House Office Building, Washington, D.C. Your assistance in this request will be invaluable.

I've assigned Tom Diaz, assistant counsel, and Rachel Jacobson of the subcommittee staff to this hearing. Please call either of them at (202) 225-2406 if you have any questions about the hearing.

We look forward to Mr. Boyd's testimony.

Sincerely,



CHARLES E. SCHUMER

Chairman, Subcommittee on Crime
 and Criminal Justice

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RESPONSE TO LEGISLATIVE REFERRAL MEMORANDUM

If your response to this request for views is simple (e.g., concur/no comment) we prefer that you respond by faxing us this response sheet. If the response is simple and you prefer to call, please call the branch-wide line shown below (NOT the analyst's line) to leave a message with a secretary.

You may also respond by (1) calling the analyst/attorney's direct line (you will be connected to voice mail if the analyst does not answer); (2) sending us a memo or letter; or (3) if you are an OASIS user in the Executive Office of the President, sending an E-mail message. Please include the LRM number shown above, and the subject shown below.

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Branch-Wide Line (to reach secretary): (202) 395-3454

FROM: 7/19/94 (Date)
RON COVY (Name)
TREAS (Agency)
622-1147 (Telephone)

SUBJECT: JUSTICE Proposed Testimony on Developments in
Firearms Technology

The following is the response of our agency to your request for views on the above-captioned subject:

☐ Concur
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☒ See proposed edits on pages _____
☒ Other: See attached
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Can I suspect there will
be more. Hopefully it will
be timely
Can