

2010

LAW ENFORCEMENT AND CORRECTIONS TECHNOLOGY ADVISORY COUNCIL

Annual Report



About the National Law Enforcement and Corrections Technology Center System

One office and three types of centers comprise the NLECTC system. These are:

- The Office of Law Enforcement Standards, which is a component of the Department of Commerce's National Institute of Standards and Technology.
- The National Center.
- The Technology Centers of Excellence.
- The Regional Centers.

All of these components work together as part of an integrated NLECTC system.

The Office of Law Enforcement Standards assists the National Institute of Justice to develop performance standards.

The National Center serves as the technology information clearinghouse of the NLECTC system. It also administers NIJ's equipment Compliance-Testing Program.

The Technology Centers of Excellence are the authoritative resource within the NLECTC system for practitioners and developers in their technology area(s) of focus. Their primary role is to assist in the transition of technology from the laboratory into practice. They accomplish this mainly through activities related

to the testing, evaluation and demonstration of new technologies and through provision of technology assistance to first adopting agencies. Each Center of Excellence supports one or more of NIJ's technology investment portfolios.

The Regional Centers are the initial point of entry for practitioners to the NLECTC system and provide generalized technology assistance to agencies within their regions. As needed, they forward requests for specialized assistance to the appropriate Center of Excellence. They also support the Centers of Excellence in coordinating technology demonstrations and evaluations with agencies within their regions.

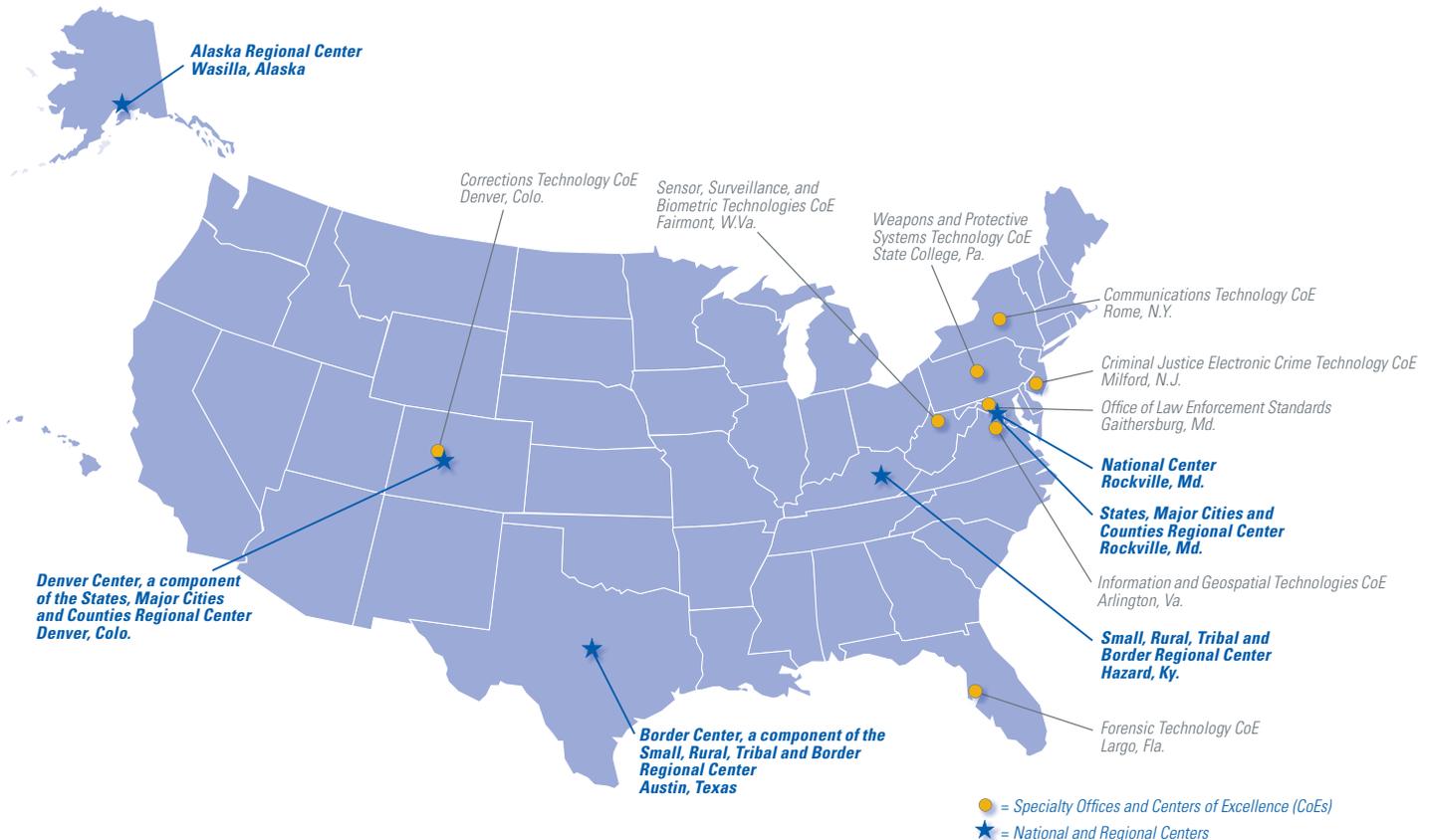
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The National Institute of Justice is a component of the Office of Justice Programs, which also includes the Bureau of Justice Assistance; the Bureau of Justice Statistics; the Community Capacity Development Office; the Office for Victims of Crime; the Office of Juvenile Justice and Delinquency Prevention; and the Office of Sex Offender Sentencing, Monitoring, Apprehending, Registering, and Tracking (SMART).

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Executive Summary

TOP 10 PRIORITIES 2010

LECTAC, the Law Enforcement and Corrections Technology Advisory Council, is a critical part of the National Institute of Justice's (NIJ) Research, Development, Test and Evaluation process, providing practitioner-based input on what technologies are most important and what technology gaps currently exist. This "real world" input helps shape the activities of NIJ's science and technology portfolios, as well as NIJ-funded research supporting the development and implementation of new technologies for criminal justice application.

LECTAC is an entity composed of approximately 35 senior leaders from law enforcement, corrections, courts, forensic science and other criminal justice agencies and professional organizations. The members of LECTAC have identified subject-matter expertise in their respective disciplines and are tasked with providing an executive-level review of the issues presented to them. The information reviewed by LECTAC in ranking these priorities has been developed by the 17 NIJ-sponsored Technology Working Groups. These TWGs, also composed of law criminal justice practitioners, are "working level" subject-matter experts who are currently assigned to roles in their agencies where they routinely work with technologies in their particular area of expertise.

LECTAC members are appointed by NIJ based on their records of distinguished service. They represent federal, state and local criminal justice agencies; labor organizations; and national and international law enforcement, corrections and criminal justice organizations.

LECTAC works to strengthen links between NIJ and the criminal justice community by reviewing and analyzing the present and future technological needs of the criminal justice system and recommending research and development priorities to NIJ.

LECTAC also:

- Advises NIJ on equipment testing and the creation of standards, user guidelines and technical reports.
- Reviews NIJ system programs and recommends how to improve program relevance to state and local law enforcement and corrections needs.
- Collaborates with the National Law Enforcement and Corrections Technology Center (NLECTC)-National and the National Institute of Standards and Technology, Office of Law Enforcement Standards to provide technical assistance to manufacturers and the criminal justice system.
- Reviews and comments on draft publications.
- Participates in ad hoc committees established by NIJ to provide guidance on technical and policy issues.
- Drafts articles for applicable publications.
- Makes presentations to peer groups to promote awareness of NIJ programs and activities.

Needs and requirements are presented alphabetically by priority areas; LECTAC views all 10 requirements as being equal in importance/priority.

Biometrics

Biometric and information technology-based tools to confirm the identity of individuals.

Communications

Interoperable standards-based computer-aided dispatch (CAD) systems.

Community Corrections/Sensors and Surveillance

Wireless communication detection/defeat technologies.

Community Corrections

Technology to locate, track and communicate location of offenders.

Corrections/Sensors and Surveillance

Improved contraband detection and concealed weapon detection technologies.

DNA Forensics

Tools for mixture interpretation of casework samples.

Electronic Crime

Improved tools to detect electronic crime and collect and process digital evidence.

Explosives

Tools to detect and neutralize improvised explosive devices (IEDs).

Less Lethal

Reliable, medically safe and effective less-lethal devices for law enforcement and corrections personnel to control combative/noncooperative individuals, including capability to deliver instantaneous and precise effects at a long distance as well as new caltivate agents, a delivery method for same, and development of an oleoresin capsicum (OC) testing standard.

Pursuit Management

Technology to remotely stop vehicles in pursuit situations.

Additional Priorities 2010

In addition to the Top 10 needs and requirements identified above, LECTAC notes the following six needs and requirements are also of high importance, and encourages that ongoing efforts in these areas continue.

Body Armor

Updated standards for ballistic helmets and stab-resistant armor.

General Forensics

Enhanced forensics analysis and reporting tools.

Information-Led Policing

Establish a common criminal justice information system (CJIS) software platform to collect and analyze data.

Modeling and Simulation

Modeling expertise in specialty positions.

Modeling and Simulation

Real-time voice recognition and language translation tool.

Officer Safety and Protective Technologies

Study the safety of mounted equipment inside a patrol vehicle during a vehicle accident.

Message From the LECTAC Executive Director

September 2010

The Law Enforcement and Corrections Technology Advisory Council, or LECTAC, is pleased to provide the National Institute of Justice with their Top 10 list of technology requirements for 2010.

The members of LECTAC and the Technology Working Groups do not presume that their deliberations encompass the full range and breadth of technology requirements for all of the approximately 19,000 individual state and local law enforcement agencies, 4,400 local jails, 50 state correctional agencies and 350 crime laboratories in the United States today. We encourage LECTAC and TWG members to seek input from their colleagues in other agencies and bring those issues forward in their meetings.

We also encourage law enforcement, corrections and forensics professionals reviewing this document to provide us with comments and suggestions. Your comments may be submitted to NLECTC-National through the online TechNeed Input Form at www.justnet.org/Pages/TechNeedForm.aspx.

Working together, we seek to advance law enforcement, corrections and forensic science through the identification and implementation of new technologies to better equip and ensure practitioners' safety in their daily duties.

Sincerely,



Lance Miller
Director, NLECTC-National
LECTAC Executive Director
Rockville, Md.

Message From the LECTAC Chair

September 2010

Dear Colleagues:

On June 17-18, 2010, the Law Enforcement and Corrections Technology Advisory Council convened in Arlington, Va., to review the Technology Working Groups' technology needs and the operational requirements established during the 2010 TWG meetings. LECTAC was tasked with reviewing 160 high-priority technology recommendations from 17 reporting TWGs to produce a Top 10 list of technology priorities.

With the assistance of National Law Enforcement and Corrections Technology Center-National staff, LECTAC reviewed the high-priority technology recommendations using a three-phase process. The first phase was conducted via an online voting ranking system.

Phase 1: LECTAC members reviewed the 160 requirements submitted by the 17 TWGs and ranked the top three requirements for each TWG. This resulted in a list of 53 requirements.

Phase 2: LECTAC members reviewed the list of 53 during the meeting and ranked what they considered to be the top 23 requirements from this list.

Phase 3: LECTAC determined the final Top 10 list, and identified an additional six items of high importance, encouraging that ongoing efforts in those areas continue.

LECTAC is submitting the technology priorities outlined in the Executive Summary and expanded on in the body of the report. The priorities are not listed by importance; all are considered equal.

Sincerely,



Greg Bazick
Deputy Chief
Ann Arbor Police
Ann Arbor, Mich.
LECTAC Chair

Introduction

In 2005, the National Institute of Justice (NIJ) revised its technology development process, implementing a Research, Development, Test and Evaluation (RDT&E) process that fully integrates all elements of the NIJ science and technology program. This process encompassed the creation of Technology Working Groups (TWGs) composed of subject-matter experts from the fields of law enforcement and corrections and incorporated review of the Law Enforcement and Corrections Technology Advisory Council (LECTAC). This process helps NIJ's Office of Science and Technology (OS&T) fulfill the requirements outlined in the Homeland Security Act of 2002, which include establishing and maintaining advisory groups to assess law enforcement technology needs of federal, state and local law enforcement agencies.

This process helps to ensure that NIJ's activities are based on practitioner-driven needs. The priorities that are generated by the working groups are incorporated into NIJ's research and development solicitations, and are also shared with other federal agencies including the U.S. Department of Defense and U.S. Department of Homeland Security to help leverage their research and development and technology investments.

The NLECTC system, at the direction of NIJ, established 17 TWGs to represent the identified core technology portfolios of NIJ/OS&T. These technology portfolios are as follows:

- Aviation Technologies.
- Biometrics.
- Body Armor.
- Communications Technologies.
- Community Corrections.
- Corrections.
- DNA Forensics.
- Electronic-Crime (E-Crime).
- Explosives.
- General Forensics.
- Geospatial Technologies.
- Information-Led Policing.
- Less-Lethal Technologies.
- Modeling and Simulation.
- Officer Safety and Protective Technologies.
- Pursuit Management.
- School Safety.
- Sensors and Surveillance.

These TWGs meet twice each year to hear briefings and establish and prioritize technology needs in their portfolio areas.

LECTAC Review

LECTAC meets annually to review the high-priority technology needs as established by the TWGs and create a Top 10 list of technology needs for NIJ derived from the TWGs' high-priority list. This list is used by NIJ program managers to prepare technology solicitations for proposals and to provide a basic direction for technology development within the various NIJ technology portfolios.

Methodologies

Prior to the annual meeting, the LECTAC members were provided with a nonranked list of 160 technology needs identified as high priority by the various TWGs. Background materials included selection criteria for members to use in ranking projects, as follows:

- Which projects will have the greatest impact on your ability to do your jobs? Those having greater impact would be ranked higher.
- Is there an existing technology that can satisfy the needs of this project? If so, then perhaps this item should be rated lower than others.
- Does this project satisfy multiple areas of need (e.g., communications, personnel safety and weapons detection)? If so, then perhaps it should receive a higher rating.
- Are there any significant obstacles that would preclude the adoption/implementation of this technology (e.g., legal, policy, training, funding, community acceptance)? If so, please note the obstacle(s). If the obstacle is determined to be significant, is there a potential mitigation plan that can be developed to address the obstacle? If not, then perhaps this item should be rated lower than others, if at all.

LECTAC members could view the complete list of high-priority items through the LECTAC online collaboration site, and were asked to rank the top three items from each TWG, resulting in a list of 53 requirements. In the next phase, which took place during the LECTAC meeting, members ranked and compiled the requirements in order of importance into a list of 23 items, and then finally into a list of 10 items. They also identified an additional six items of high importance, encouraging that ongoing efforts in those areas continue. In addition to describing the top priorities, this report includes the text of the 53 requirements.

Performance Measurement and Evaluation

Performance measurement and evaluation have become more important as aspects of accountability. In this regard, NIJ has expanded the LECTAC/TWG process to include consideration of the specific problem and desired outcomes related to needs requirements. By including the development of problem statements and desired outcomes of the research and development in the needs requirements and prioritization process, NIJ can better assess the urgency of a given problem and in this way, better prioritize allocation of increasingly scarce resources. Also, by including declaration of desired outcomes, NIJ can better design appropriate methods for use in evaluation of technologies resulting from the process.

The primary purpose of a problem statement is to focus the attention of the problem-solving team. However, if the focus of the problem is too narrow or the scope of the solution too limited, creativity and innovation may be stifled. A problem statement is the description of an active challenge faced by practitioners that does not have adequate solutions available. The problem statement should address all six questions: what, how, where, when, why and who.

Statements of expected outcomes follow directly from the problems and needs requirements that the newly developed technology will be designed to address. Resources for criminal justice are increasingly scarce while the criminal justice system is being held to higher standards of accountability. In this regard, NIJ is increasingly being asked whether research and development efforts are resulting in measurable and significant outcomes as a result of the investment in public funds.

Statements of desired outcomes should always include some estimation of effect. There may be many or multiple desirable outcomes and impacts resulting from the successful development of a new or innovative technology. The development of statements of desirable outcomes allows NIJ to assess the extent, nature and type of evaluation research needed to provide an assessment of the technologies' effectiveness, efficiency and costs/benefits.

Business Meeting

Arlington, Virginia
June 17–18, 2010

Lance Miller, Director of NLECTC-National, moderated the meeting.

The two-year term of LECTAC Chair Greg Bazick, deputy chief of the Ann Arbor (Mich.) Police Department, is expiring. Also, Jeffrey Beard, LECTAC Vice Chair for Corrections, is retiring from his duties at the Pennsylvania Department of Corrections, and therefore from LECTAC as well.

In addition to the technology priority review, LECTAC members heard and viewed presentations on the NIJ science and technology program and the various portfolios, and NIJ's standards and testing program:

- Chris Tillery, Associate Office Director for Science and Technology, NIJ, NIJ Science and Technology program overview.
- Dave Hart, Division Director, Operational Technologies Division, program update.
- William Ford, Division Director, Information and Sensors Technologies Division, program update.
- Danielle McLeod-Henning Program Manager, General Forensics R&D program, Office of Investigative and Forensic Sciences, program update.
- Scott Barker, Director, Small, Rural, Tribal and Border Regional Center, program update.
- Lance Miller, Director, NLECTC-National and States, Major Cities and Counties Regional Center, program update.
- Bob Griffiths, Director, Alaska Regional Center, program update.
- Lance Miller and Jamie Phillips, NLECTC-National Conformity Assessment Coordinator, NIJ Standards and Testing Program and Body Armor, program update.

All presentations were made available to LECTAC members via the LECTAC online collaboration site.

Prior to the LECTAC meeting, the original list of 160 priorities identified by the TWGs was reduced by LECTAC members to 53 using an online voting ranking system. Mr. Miller facilitated the priority selection session. The first day LECTAC members divided into two groups to identify priorities from

the list of 53. The two groups identified priorities to keep, combine with other items or remove from the list. Participants then came back as a full group, and discussed the priorities at length, resulting in a list of 23. The group discussed the priorities on the afternoon of the first day, and completed work on the second day, identifying the top 10 priorities as well as a six others. LECTAC members said the first 10 were the most important, and that the remaining items could be listed as additional priorities for which ongoing efforts should continue. Although these projects do not appear in the Top 10, they are important projects and work should continue. These include:

- Establish a common CJIS platform to collect and analyze data.
- Enhanced forensics analysis and reporting tools.
- Modeling expertise in specialty positions.
- Updated standards for ballistic helmets and stab-resistant armor.
- Real-time voice recognition and language translation tool.
- Study the safety of mounted equipment inside a patrol vehicle during a vehicle accident.

The list was made available to the LECTAC membership for approval online. The results presented in this report represent approval by the entire membership.

The priorities are not listed by importance; all are considered equal. They are listed in alphabetical order. On the individual pages for each priority, each is mapped back to the TWGs, and an icon appears that identifies which of the five areas in the NIJ *High-Priority Criminal Justice Technology Needs* report the priority maps back to:

- Protecting the Public 
- Ensuring Officer Safety 
- Confirming the Guilty and Protecting the Innocent 
- Improving the Efficiency of Justice 
- Enabling Informed Decisionmaking 

In addition to designating the priority list, discussion included ways to improve NIJ/LECTAC/TWG interaction. Discussion is not detailed here, but was captured in a separate minutes-type summary report, which was distributed to LECTAC members.

Biometrics



Maps to TWGs

Biometrics

Maps to Requirements # (In order of importance)

3, 22, 48

Technology Need or Requirement

Biometric and information technology-based tools to confirm the identity of individuals.

Description of Need

Generally, law enforcement, corrections, and probation and parole officers need improved technologies to facilitate confirming the identity of a person of interest in a timely manner. Specifically, they need the ability to identify a person through capture of a facial image, iris scan and/or voice recording on an audio/video device, which can then be checked against a nationwide database, and the ability to speed up the collection of latent and rolled finger and palm prints, possibly via a device that can collect these prints in the field and then convert them to a digital format for comparison to the Automated Fingerprint Identification System (AFIS) database.

Expected Outcomes

- 1) Reduce the number of felonious assaults/fatalities of law enforcement officers by reducing or eliminating the amount of time spent waiting in the field to identify individuals detained during field interviews/traffic stops.
- 2) Increase efficiency and reduce the amount of time spent processing arrestees and incarcerated subjects, ensuring accurate and positive identification of these individuals.
- 3) Increase public safety through rapid and accurate biometric identification of wanted criminals, known/suspected terrorists, individuals on parole/probation and persons of interest to ongoing investigations from remote or standoff distances in public venues.
- 4) Enhance criminal justice/citizen interactions with regard to safety, efficiency and effectiveness through adoption and implementation of these technologies.

Communications



Maps to TWGs

Communications Technologies

Maps to Requirements # (In order of importance)

12, 30

Technology Need or Requirement

Interoperable standards-based computer-aided dispatch (CAD) systems.

Description of Need

Disparate CAD systems among agencies results in inability to exchange data seamlessly, and in real time. Identify solutions and standards to mitigate future problems. Issues: fusion center issues; development of COPLINK (RMS) evolved from TWG coordination; development of intelligent software – need standards-based information that forces it to other systems; and interface standards of new systems.

Expected Outcomes

1) Investigate if a standard currently exists, 2) if not, establish one, 3) implement a mandatory requirement that the standard be a part of the standard CAD base, 4) make it a requirement that it be included in the next generation 911 specifications.

Communications/Corrections/ Sensors and Surveillance



Maps to TWGs

Communications Technologies, Corrections, Sensors and Surveillance

Maps to Requirements # (In order of Importance)

18, 24, 41, 46

Technology Need or Requirement

Wireless communication detection/defeat technologies.

Description of Need

1) The introduction and use of unauthorized wireless communication devices creates a serious security concern for corrections. This is an important issue, as evidenced by legislation created by a number of states making it a felony to introduce a cell phone into a prison. Inmates use these devices to carry on criminal activities to facilitate escape attempts, harass victims and intimidate staff. Corrections requires cost-effective technology that eliminates unauthorized wireless communications and/or assists in accurate (x,y,z coordinates) location detection of a broad range of wireless communication, including cell phones, walkie talkies, blackberries, Bluetooth devices and PDAs. Technology must have the capability to defeat or detect devices based on frequency bandwidth, whether intact or broken down into component parts, whether powered on or not, and should not interfere with desirable RF devices used by staff. System capability should be integrated into a central data and communications infrastructure.

2) Law enforcement needs technology and techniques to detect, identify, classify and locate wireless communication devices. There is also a need for the ability to identify, then legally isolate, defeat and control cellular or other wireless communications connections within a controlled environment for emergency law enforcement applications (mobile/tactical operations). This includes techniques other than jamming that can be used with or without active participation of cellular systems carriers.

3) Law enforcement needs technology that will prohibit unauthorized wireless communications, or allow law enforcement the ability to selectively filter which communications are allowed, in a defined area. The technology exists, but is cost prohibitive and currently not allowed under Federal

**Expected
Outcomes**

Communications Commission regulations. Investigate legal issues regarding deployment; obtain temporary authority to conduct testing and evaluations; compare cost and performance of jamming vs. detection vs. selective filtering; and determine if jamming interferes with public safety/health.

1) Significant reduction and/or elimination of the use of unauthorized wireless communication devices, which would result in the great reduction of associated criminal activity both inside correctional institutions and in the community.

2) A way to identify, then legally isolate, defeat and control cellular or other wireless communications connections within a controlled environment for emergency law enforcement applications. This should include techniques other than jamming that can be used with or without active participation of cellular systems carriers.

Community Corrections



Maps to TWGs

Community Corrections

Maps to Requirements # (In order of importance)

6, 27, 49

Technology Need or Requirement

Technology to locate, track and communicate the location of offenders.

Description of Need

- 1) Community corrections professionals need better location and tracking technologies to monitor and communicate information about the whereabouts of predatory and violent offenders in all environments within the community, because current location tracking systems do not perform to the requirements of public safety. Current systems have difficulty tracking offenders indoors, underground and anywhere the subject is beyond the “sight” of the satellite system. Also, near real-time communications of offender location are dependent on the availability of cellular communications. Solutions must provide cost-effective, accurate, and reliable continuous monitoring and communication of whereabouts in all environments and include highly secure circumvention prevention and detection measures. The technology must locate on x, y and z coordinates; that is, in addition to latitude and longitude, it must be able to determine what floor the offender is on within a multistory building.
- 2) Research and develop technologies for positional location devices to detect intentional signal blocking/jamming. Current location and tracking systems are vulnerable to offender tampering, which can compromise system integrity.
- 3) Research and develop improved and alternative options for tethering a tracking device to an offender. Existing options often consist of bulky equipment that readily identifies the subject as an offender. Provide technology that is secure and provides an alternative more conducive to offender re-entry efforts than a large device strapped to an ankle.

**Expected
Outcomes**

- 1) Increased accountability of the offender and increased confidence in the offender tracking technology, which should lead to more use of the technology as an offender management tool to support alternatives to incarceration and offender re-entry initiatives.
- 2) The outcome for the alternative tethering requirement will be more sensitive matching of tethering technology to an offender's particular needs (e.g., vocational situation).

Corrections/Sensors and Surveillance



Maps to TWGs

Corrections, Sensors and Surveillance

Maps to Requirements # (In order of importance)

7, 21

Technology Need or Requirement

Improved contraband detection and concealed weapon detection technologies.

Description of Need

1) Corrections personnel require technologies for use at egress and ingress points that will integrate and improve existing methods of detecting a broad spectrum of contraband such as, but not limited to, metallic and nonmetallic weapons, drugs, tobacco and wireless communications devices. This portal device must safely and nonintrusively detect contraband carried on the body and within body cavities, provide rapid throughput, be user-friendly in operation and maintenance, and be affordable enough to be a viable solution for most correctional agencies.

2) Develop technology to prevent the introduction of metallic and nonmetallic contraband at any controlled access point for less than \$25,000. Millimeter wave technology is available, but currently is too expensive for law enforcement. Determine what technologies/tools are available at any price point and identify legal issues.

Expected Outcomes

1) Significantly decrease the amount of contraband introduced into a typical correctional facility.

2) Development and deployment of a successful commercial solution for less than \$25,000.

DNA Forensics



Maps to TWGs

DNA Forensics

Maps to Requirements # (In order of Importance)

10

Technology Need or Requirement

Tools for mixture interpretation of casework samples.

Description of Need

The DNA forensic community needs a validation kit for mixture interpretation of casework samples. Needed are datasets (not samples), profiles (various kits/platforms/triallelic samples), and raw data for labs to process. Tools to interpret three-person (or more) mixtures is a priority. It may be possible to explore with the National Institute of Standards and Technology or Forensic Technologies Center of Excellence.

DNA lab analysts need a system that can perform quantitative interpretation of STR data from mixtures of two or more individuals. The system should be able to calculate ratios on three-person mixtures; work on partial STR profiles and degraded DNA samples; and be Web-based and compatible with the Laboratory Information Management Systems (LIMS). Current systems are not good for examining more than two individual mixtures. True Allele technology needs to be assessed; it is in development and has the best approach to a nonbiased way of looking at mixtures, but gives up speed of resolution. Develop new systems and assess and improve current systems.

Standardization of mixture interpretation is needed. Evaluate existing programs and consider setting up a test bed similar to that done for database laboratories, except the programs would be used to supplement the interpretation step in the process rather than replace it. This would be done with the newly released Scientific Working Group on DNA Analysis Methods (SWGDM) guidelines.

Expected Outcomes

More standardized and quantitative output for mixture interpretation, requiring less analyst time, and expedited review of DNA profiles, leading to higher throughput of forensic DNA analyses.

Electronic Crime



Maps to TWGs

Electronic Crime

Maps to Requirements # (In order of importance)

4, 29, 50

Technology Need or Requirement

Improved tools to detect electronic crime and collect and process digital evidence.

Description of Need

- 1) The criminal justice community needs tools and technologies to improve the overall digital evidence examination capability and performance (e.g., backlog reduction) by a measurable order of magnitude. Current forensic and investigation technology fails to meet the demand of the present cyber crime backlog. Fundamental improvements are needed in performance of core forensic processing (e.g., acquisition, hashing, indexing, searching, triage, cracking).
- 2) Develop tools and technologies to investigate electronic crime involving computer networks and conduct forensic examination of networked computers, devices and components for information of evidential value. Most computers are connected to local area networks (LAN) or wide area networks (WAN). Valuable information regarding connections, activities and remote data storage locations can be recovered from network computers and components.
- 3) Develop digital evidence collection tools for cloud computing environments. Cloud computing is an emerging technology that can be accessed and exploited from a variety of computing platforms, including mobile devices and cell phones.

Expected Outcomes

- 1) Proposals which will create advancements, develop solutions or improve existing methods of any component or aspect of the data acquisition and analysis processes that will improve overall digital evidence acquisition and analysis performance. Solutions must demonstrate an articulable order of magnitude improvement over existing methods and protocols. Resulting solutions must be available free to state and local law enforcement or at cost if hardware is a portion of the solution.

2) Assets that will improve the performance of electronic crime investigators and digital evidence examiners, providing them the tools, protocols and knowledge to identify, acquire and incorporate network communication data into investigations and examinations.

3) Tools for investigating cloud computing environments would enhance skill sets of the criminal justice community to access and acquire information of investigative value stored using advanced technology that can be adapted to hide evidence from detection and seizure.

Explosives



Maps to TWGs

Explosives

Maps to Requirements # (In order of importance)

1, 20

Technology Need or Requirement

Tools to detect and neutralize improvised explosive devices (IEDs).

Description of Need

1) Technologies and research are needed to assist bomb technicians in properly responding to vehicle-borne improvised explosive devices (VBIEDs), specifically:

- Complete sufficient VBIED expulsion type tool characterization, with emphasis on impulse measurement and target validation to allow for the selection of one acceptable solution set to be inserted into the FBI Hazardous Devices School (HDS) VBIED Intensification Course.
- Once an expulsion tool is selected, conduct shock sensitivity testing to find the threshold for applying this tool (and possibly a few other VBIED tools that remain viable after full characterization) against each type of explosive, to include various common types of homemade explosives (HMEs).
- Once an expulsion tool is selected, develop a delivery capability for it using the standard fleet of bomb squad robots.
- Complete the development of single-side x-ray technology for bomb squad application, which includes the current project to reduce the size so it can be towed behind a bomb squad robot.
- Continue to develop other diagnostic tools that have the capability to make repeated remote penetrations of a VBIED cargo area and provide for visual reconnaissance of the interior. This level of reconnaissance should be all the way to the center of the cargo area, and behind obstacles.
- Develop the capability to conduct a remote surgical attack on critical components of the circuit in a VBIED.
- Continue the development of a general overpressure type VBIED tool, with attention to rapid deployment capability, including the ability to carry it on the bomb truck in a near-ready configuration and the ability to deploy it with the most common robots in the bomb

squad fleet (Andros F6-A) against the full range of trucks, including those with cabs of maximum height. Consideration should be given to reducing the forces on the robot arm (weight) to ensure that the robot is not damaged by routine deployments of this tool.

- Develop a method of extracting the main charge from the cargo area of a truck through an open door, using the existing fleet of bomb squad robots as the primary platform.
- Develop prediction/modeling software for overpressures created by VBIED expulsion tools, including comparison models for detonation of the main charge in the VBIED.
- For the long term, begin to develop a capability for remotely disassembling a VBIED, including outer cargo body disassembly, inner container opening, circuit attack, and main charge removal and disposal, with the ability to conduct ongoing visual and chemical diagnostics at each step of the operation.

2) Continue development of the national bomb squad electronic countermeasure (ECM) program and the technologies that support it, toward defeating the full range of radio-controlled improvised explosive devices (RCIED) threats.

Expected Outcomes

Preparedness by bomb squads for VBIED response and significant improvement to national security resulting from bomb squads having ECM capability to deal with RCIEDs.

Less Lethal



Maps to TWGs

Less Lethal

Maps to Requirements # (In order of Importance)

5, 32, 33

Technology Need or Requirement

Reliable, medically safe and effective less-lethal devices for law enforcement and corrections personnel to control combative/noncooperative individuals, including capability to deliver instantaneous and precise effects at a long distance as well as new calmativ agents, a delivery method for same, and development of an oleoresin capsicum (OC) testing standard.

Description of Need

1) Law enforcement and corrections officers need technology to provide a repeatable, near-instantaneous less-lethal effect on a human target. The technology would deliver an effect at a long stand-off distance to one or two individuals in a group or crowd without collateral effects to others. Current technology lacks the capability to deliver instantaneous and precise effects at long distance. Two technologies with demonstrated promise are directed energy systems: millimeter wave (RF/MMW) and infrared lasers (IR/LASER).

[Monitoring of manufacturers' efforts is ongoing, including untethered EMD devices such as TASER XREP, TASER 40mm and LEKTROX 40mm. NIJ is funding an operational evaluation of the Raytheon DE Assault Intervention Device through the Los Angeles Sheriff's Department and the Weapons and Protective Systems Technologies Center of Excellence, to determine its impact on reducing inmate assaults, lessening the severity of assaults, and enabling more rapid intervention by jail staff.]

2) The criminal justice community needs a capability to inhibit metabolic functioning of individuals and groups (calmativ agents) that is quick-acting, completely reversible and has no long-term physical or psychological effects, along with a method of delivery that is capable of delivering at a variety of ranges to a target of one or many.

**Expected
Outcomes**

3) OC products need a product and labeling testing standard to verify that contents are safe and consistent with product labeling and NIJ-approved standards. Labeling and testing standards are necessary for all modalities and forms of OC.

1) Improved ability to resolve hostage situations with reduced injury and death to officers, victims and subjects. Directed energy: Immediate immobilization at extended distances that is fully recoverable in two to five minutes. Calmative agents: Immediate immobilization that is fully recoverable in two to 30 minutes.

2) An OC testing and labeling standard will ensure full and accessible disclosure of product ingredients by manufacturers; provide a means of monitoring and oversight of products; result in safer products (full disclosure of extraneous accelerators or enhancers in products) and more consistent effects; and facilitate officer recognition of contents through standard labeling.

Pursuit Management



Maps to TWGs

Pursuit Management

Maps to Requirements # (In order of importance)

2, 19

Technology Need or Requirement

Technology to remotely stop vehicles in pursuit situations.

Description of Need

The law enforcement community needs the ability to safely control and stop pursuits using police-activated intervention technologies and cooperative technologies. Many original equipment and after-market systems exist that allow remote monitoring and control of a vehicle's functions. This technology is cooperative because the system depends on technology preinstalled on vehicles that is designed to cooperate with law enforcement instructions during an emergency.

Operational requirements include low power consumption; resistance to tampering; technology acceptable to manufacturers, legislative bodies and the public; accuracy of communication with the correct vehicle; alternate method of identifying the target vehicle, like GPS, in case target vehicle's license plate has been switched or misread by the officer; ability to communicate with target vehicle and flash headlights or implement other command within 30 seconds of initiation; secure communications link; ability to handle multiple (up to 20) pursuits at one time; and monitoring and an auditable trail documenting actions required for both human and automated interfaces. OnStar, operated by General Motors, is an example of a cooperative technology that has many desired features, such as a data and voice communications link, a full-time call center, GPS tracking capability and integration with a vehicle electronics. A system like this has the existing capability to flash the headlights and sound the horn of a fleeing vehicle as a rudimentary warning system. The potential also exists to control a vehicle's speed.

There is a high probability that suppression of the vehicle cannot happen quickly (less than one minute) if law enforcement has to go through a command structure. A trial is needed to show that direct intervention is possible from an officer's vehicle.

Expected Outcomes

Investigate the means of cooperative technology exploitation by mapping systems to find areas to exploit; identifying methods of exploitation; identifying counter measures; researching constitutional law issues, legislative requirements and publishing pursuit policy guidance; identifying potential stand-alone systems available only for use by law enforcement; and forming a working group to include representatives from industry, law enforcement and policy managers.

Show that direct intervention is possible from the officer's vehicle as follows:
1) Purchase cell phone intercept equipment, 2) connect to a vehicle that is equipped with OnStar or similar technology, 3) remotely control parameters, and 4) explore other communications paths into the vehicle such as V2V or R2V or maintenance ports.

Additional Priorities

In addition to the Top 10 needs and requirements identified above, LECTAC notes the following six needs and requirements are also of high importance, and encourages that ongoing efforts in these areas continue.

Body Armor



Maps to TWGs

Body Armor

Maps to Requirements # (In order of importance)

11, 23

Technology Need or Requirement

Updated standards for ballistic helmets and stab-resistant armor..

Description of Need

1) The current version of the NIJ Standard for Ballistic Helmets (0106.01) was published in 1981 and it needs to be updated to reflect current ballistic threats, test methods, research into blunt trauma impact effects, etc. While wearing ballistic helmets, officers often are subject to strikes from objects such as bats or clubs. A nonpenetrating ballistic strike can also have a blunt trauma impact. NIJ may decide to combine the ballistic helmet standard and the riot and face shield standard.

2) The current NIJ standard on stab-resistant armor is based on research and a resulting standard devised in the United Kingdom. There is concern that it is not appropriate for use in the different criminal justice environment of the United States.

Expected Outcomes

1) Research into head injuries resulting from blunt trauma impact on a helmet; requirements and test methods that address blunt trauma resulting from nonpenetrating rounds, specifically development of a validated test method that is applicable to blunt trauma injuries sustained when wearing helmets; requirements that address nonballistic impacts such as fit and impact resistance; and increased officer safety and reduction/elimination of blunt trauma injuries.

2) Research into actual weapons used against corrections officers (including plexiglass, metal, wooden and plastic) to determine types of weapons, dimensions, materials and other details; testing of weapons to collect data on sharpness, hardness and other features; research into locations in facilities

where attacks typically occur, location on the body where stabs and slashes are experienced, how attacks occur and differences in attacks by male and female inmates; identify new backing material and develop an improved penetration depth measurement; improved test method; an improved standard; an educational video focusing specifically on stab-resistant armor; improved protection and resulting reduction in injuries and fatalities.

General Forensics



Maps to TWGs

General Forensics

Maps to Requirements # (In order of importance)

13, 34, 45

Technology Need or Requirement

Enhanced forensics analysis and reporting tools.

Description of Need

1) The criminal justice community needs research on the foundational aspects of individualization and the significance of class characteristics for pattern and impression evidence, specifically prevalence of class characteristics within a population based on regional, year-to-year, group association (such as gangs); standardized non-numeric criteria for identification for impression evidence; and the reproducibility of characteristics between impression evidence made with the same item.

2) The criminal justice community needs research on the examination and conclusion process, including the criteria for the determination of value for comparison and identification/exclusion purposes; and the ranges of conclusions and standardization of conclusions based on examiner training and experience effects, facility accreditation or examiner certification.

3) The criminal justice community needs research to determine accuracy in order to address the error rate issues in *Daubert*. Issues include the lack of studies that examine the error of individual examiners and the lack of understanding of error rates pertaining to collection issues, examination or analytical processes, verification issues, or technical review issues.

Expected Outcomes

1) Pattern and impression evidence practitioners will have the necessary statistical studies for reference, which can assist in the determination of the significance of class evidence and perhaps aid in making an individualization.

2) The forensic community will have research that provides a foundational basis for assigning value to a particular comparison (identification/exclusion) and provides knowledge about the impact of analyst certification and lab accreditation.

3) An understanding of how the processes involved in impression and pattern evidence collection, examination, analysis, verification and technical review can contribute to error rate

Information-Led Policing



Maps to TWGs

Information-Led Policing

Maps to Requirements # (In order of importance)

8

Technology Need or Requirement

Establish a common criminal justice information system (CJIS) software platform to collect and analyze data.

Description of Need

Develop an extensible common CJIS baseline software platform available to all law enforcement/corrections agencies to collect and analyze criminal justice data. Invest in the establishment of a no-cost centrally hosted criminal justice software baseline. Increase the number of system capabilities available to all criminal justice agencies to improve the availability, analysis and quality of information available to law enforcement/corrections officers. Smaller state and local agencies lack the resources to establish and support a baseline criminal justice software capability that allows them to take full advantage of critical law enforcement data. Many existing systems do not provide the ability to invest in software plug-ins/extensions that could be leveraged by other agencies with limited costs.

Expected Outcomes

Incrementally identify available free criminal justice software components and identify how they can be utilized to form a criminal justice baseline and what gaps exist in that baseline. Also, reduce acquisition and annual maintenance costs by making a free configuration-controlled software platform available to criminal justice agencies with a mechanism for contributing new plug-ins and extensions. In the long term, increase the capabilities available in the baseline and provide an easy method for retrieval, submission of plug-ins/extensions, configuration control and installation/maintenance documentation.

Modeling and Simulation



Maps to TWGs

Modeling and Simulation

Maps to Requirements # (In order of importance)

14

Technology Need or Requirement

Modeling expertise in specialty positions.

Description of Need

There is no law enforcement specific software or capability (such as a decision-making tool) that allows an agency to model an expert in a given area, such as forensics. There is a need for a software or capability that does not require development of another new piece of hardware (using iPod technology as an application for existing technology would be encouraged). Currently, most agencies in the U.S. do not have a full-time forensics employee on staff 24/7 to respond to crime scenes. Because of staff inability or ignorance on preserving or collecting evidence, criminal cases are compromised.

Expected Outcomes

Assist the investigating officer in ensuring he follows expert protocol to preserve and collect evidence at crime scenes. The ability for this tool to upload and transmit the captured information and images to a remote subject matter expert for real-time assistance is desired.

Modeling and Simulation



Maps to TWGs

Modeling and Simulation

Maps to Requirements # (In order of importance)

38

Technology Need or Requirement

Real-time voice recognition and language translation tool.

Description of Need

Patrol officers and corrections personnel encountering Spanish and other non-English-speaking persons are unable to effectively and efficiently communicate with each other. A technology or tool is needed that would enable real-time voice recognition and language translation. Limited/no communication with a non-English speaking individual and/or delayed response for a translator to arrive on scene compromises officer safety and efficiency in investigating time-sensitive matters. Misunderstandings on scene with non-English speaking individuals could result in errors in judgment and decision-making, which creates a liability situation. Concerns include possible legal issues; size, usability and ruggedness of the device; and ability to record, receive updates and understand slang. The technology capability may already exist.

Expected Outcomes

Ability of law enforcement and corrections personnel to communicate in real-time with Spanish and other non-English speaking individuals, improving the communication and resulting in better decision-making.

Officer Safety and Protective Technologies



Maps to TWGs

Officer Safety and Protective Technologies

Maps to Requirements # (In order of importance)

52

Technology Need or Requirement

Study the safety of mounted equipment inside a patrol vehicle during a vehicle accident.

Description of Need

Information is needed on the effect of vehicle crashes on mounted equipment inside a patrol vehicle, including laptop mounts, radar mounts and any other after-market equipment installed inside the vehicle that may harm vehicle occupants. Information also is needed on ergonomic effects of position and usage of equipment mounted inside a patrol vehicle.

Expected Outcomes

Expand NIJ patrol vehicle evaluations to include proper mounting of additional (after-market) equipment required for patrol operations. Documentation is available from Chevrolet, Dodge and Ford indicating safe zones where equipment can be mounted and not interfere with or hamper the active or passive safety devices built into vehicles, and should be reviewed for inclusion of the NIJ vehicle study. At the same time, safety devices must show a substantial decrease in the number of job-related injuries (e.g., back strain, carpal tunnel) requiring therapy or medical intervention.

LECTAC Round 1 Rankings (Top 53)

LECTAC meets annually to review the high-priority technology needs as established by the TWGs and create a Top 10 list of technology needs for NIJ derived from the TWGs' high-priority list. The following list is the product of the first phase of the process: Review of 160 requirements submitted by the 17 TWGs and ranking the top three requirements for each TWG, resulting in a list of 53 requirements. These results were discussed at the annual business meeting to create the final Top 10 list.

Members voted online through the LECTAC database. The database, developed by NLECTC-National and housed on the NLECTC system's intranet, allows members to prioritize the TWG-generated needs and requirements online instead of reviewing information in binders and manually submitting their rankings.

RANKING: 1

Explosives

TWG Recommendation

Prepare Bomb Squads for Vehicle Borne Improvised Explosive Devices (VBIEDs)

Description of Issue/Requirement/Need

Technologies and research are needed to assist bomb technicians in properly responding to vehicle-borne improvised explosive devices (VBIEDs):

a.) Complete sufficient VBIED expulsion type tool characterization, with emphasis on impulse measurement and target validation to allow for the selection of one acceptable solution set to be inserted into the FBI Hazardous Devices School (HDS) VBIED Intensification Course.

b.) Once an expulsion tool is selected, conduct shock sensitivity testing to find the threshold for applying this tool (and possibly a few other VBIED tools that remain viable after full characterization) against each type of explosive, to include various common types of homemade explosives (HMEs).

c.) Once an expulsion tool is selected, develop a delivery capability for it using the standard fleet of bomb squad robots.

d.) Complete the development of single-side x-ray technology for bomb squad application, which includes the current project to reduce the size so it can be towed behind a bomb squad robot.

e.) Continue to develop other diagnostic tools that have the capability to make repeated remote penetrations of a VBIED cargo area and provide for visual reconnaissance of the interior. This level of reconnaissance should be all the way to the center of the cargo area, and behind obstacles.

f.) Develop the capability to conduct a remote surgical attack on critical components of the circuit in a VBIED.

g.) Continue the development of a general overpressure type VBIED tool, with attention to rapid deployment capability, including the ability to carry it on the bomb truck in a near-ready configuration and the ability to deploy it with the most common robots in the bomb squad fleet (Andros F6-A) against the full range of trucks, including those with cabs of maximum height. Consideration should be given to reducing the forces on the robot arm (weight) to ensure that the robot is not damaged by routine deployments of this tool.

h.) Develop a method of extracting the main charge from the cargo area of a truck through an open door, using the existing fleet of bomb squad robots as the primary platform.

i.) Develop prediction/modeling software for overpressures created by VBIED expulsion tools and including comparison models for detonation of the main charge in the VBIED.

j.) For the long term, begin to develop a capability for remotely disassembling a VBIED, including outer cargo body disassembly, inner container opening, circuit attack and main charge removal and disposal, with the ability to conduct ongoing visual and chemical diagnostics at each step of the operation.

TWG Recommended Outcomes

Preparedness by bomb squads for VBIED response.

RANKING: 2

Pursuit Management

TWG Recommendation

Controlling or Stopping Pursuits Using Cooperative Technologies

Description of Issue/Requirement/Need

The law enforcement community needs the ability to safely control and stop pursuits using cooperative technologies. Many original equipment and after-market systems exist that allow remote monitoring and control of a vehicle's functions. This technology is cooperative because the system depends on technology preinstalled on vehicles that is

designed to cooperate with law enforcement instructions during an emergency.

Some of the operational requirements of this technology include: low power consumption; resistance to tampering; technology acceptable to manufacturers, legislative bodies and the public; accuracy of communication with the correct vehicle; alternate method of identifying the target vehicle, like GPS, in case target vehicle's license plate has been switched or misread by officer; ability to communicate with target vehicle and flash headlights or implement other command within 30 seconds of initiation; technology operational lifespan equal to that of vehicle; communicates with target vehicles in urban and rural areas, with minimal hindrance from bridges, buildings and terrain; secure communications link; call center ability to handle multiple (up to 20) pursuits at one time; verification process on communication link to ensure that correct vehicle is targeted; two-way communication required through communications links; monitoring and an auditable trail documenting all actions required for both human and automated interfaces. The telematics technology, OnStar, operated by General Motors, is an example of a cooperative technology that has many desired features, such as a data and voice communications link, a full-time call center, GPS tracking capability and integration with a vehicle electronics. A system like this has the existing capability to flash the headlights and sound the horn of a fleeing vehicle as a rudimentary warning system. The potential also exists to control a vehicle's speed.

TWG Recommended Outcomes

The objectives of this project are to investigate the mean of cooperative technology exploitation by: mapping systems to find areas to exploit; identifying methods of exploitation; identifying counter measures; researching constitutional law issues, legislative requirements and publishing pursuit policy guidance; identifying potential stand-alone systems available only for use by law enforcement; and stand up working group to include industry, law enforcement and policy managers.

RANKING: 3

Biometrics

TWG Recommendation

Confirming and Fixing the Identity of Individuals

Description of Issue/Requirement/Need

Law enforcement/corrections officers need improved technologies to use when attempting to confirm a person's identity. This technology would be used in situations such as: 1) intake and outtake of inmates, 2) positive identification of visitors to correctional institutions, 3) confirming the identity of a person possessing multiple identification documents, 4) mortuary identification (the TWG noted interest in technologies that could be used for rapid identification in the wake of a mass casualty event), 5) wants and warrants verification, 6) offender/suspect tracking (sex offender, gangs, arsonist, etc.), 7) criminal history checks, 8) facilitation of queries across criminal justice information system databases. The TWG recognized four prominent biometric

technologies as candidates: 1) finger/palm prints, 2) facial recognition, 3) iris scan, 4) voice recognition.

TWG Recommended Outcomes

Numerous awards made in response to this and other requirements identified by the TWG: 1) Solicitation for Concept Papers: Sensors, Surveillance, and Biometrics Technologies for Criminal Justice, October 2004; 2) Solicitation for Concept Papers: Biometric Technologies, October 2005; 3) Solicitation: Biometric Technologies, November 2, 2006 due date. For this specific requirement, the following projects have been funded: 1) Efficient, Field Optimized Multi-Modal Biometric System; 2) Standards Based Performance and User Cooperation Studies of Commercial Iris Recognition Products; Multimodal Biometric Fusion with Predictive Quality Metrics. Special Note: In addition to these projects, the Border Research and Technology Center (BRTC) is facilitating the demonstration of the "Cross Match Guardian" fast capture (Type 14 Flats) to a local law enforcement task force with cross-border highway checkpoint responsibilities.

RANKING: 4

Electronic Crime

TWG Recommendation

Improve Digital Evidence Examination Capability and Performance

Description of Issue/Requirement/Need

The criminal justice community needs tools and technologies to improve the overall digital

evidence examination capability and performance (e.g., backlog reduction) by a measurable order of magnitude. Current forensic and investigation technology fails to meet the demand of present cyber crime backlog. Fundamental improvements in performance of core forensic processing (i.e., acquisition, hashing, indexing, searching, triage, cracking, etc.) are needed

TWG Recommended Outcomes

Proposals that will create advancements, develop solutions or improve existing methods of any component or aspect of the data acquisition and analysis processes that will improve overall digital evidence acquisition and analysis performance. Solutions must demonstrate an articulable order of magnitude improvement over existing methods and protocols. Resulting solutions must be available free to state and local law enforcement or at cost if hardware is a portion of the solution.

RANKING: 5

Less Lethal

TWG Recommendation

New Calmative Agents: Calmative Agent Delivery System

Description of Issue/Requirement/Need

The criminal justice community needs a capability to inhibit metabolic functioning of individuals and groups that is quick acting, completely reversible and has no long-term physical or psychological effects. The criminal justice community needs a method of delivery for a metabolic function inhibitor that is capable

of delivering at a variety of ranges to a target of one or many.

OPERATIONAL SCENARIO(S): Single aggressor, barricaded suspect, hostage rescue-clearing facilities and corrections-prisoner disorder.

[Current project partially addressing this issue is: 2007-DE-BX-K009 (Operationalizing Calmatives-Concepts and Technologies). Study should yield sufficient data to focus and solicit manufacturer development effort.]

TWG Recommended Outcomes

This technology will provide a tool with which officers can resolve hostage situations with reduced injury and death to officers, victims and subjects.

REQUIRED RESPONSE(S): Immediate immobilization fully recoverable in two to 30 minutes, immediate and full impairment of physical function with full recovery, immediate disruption of ability to sense and interpret information with full recovery and immediate full compliance.

RANKING: 6

Community Corrections

TWG Recommendation

Technology to Locate, Track and Communicate Whereabouts of Predatory Offenders in All Environments

Description of Issue/Requirement/Need

Current location tracking systems do not perform to the requirements of public safety. These systems have difficulty tracking offenders indoors, underground and anywhere the subject is beyond the “sight” of the satellite system. In addition, near real-time communications of offender location are dependent on the availability of cellular communications. Community corrections requires better location and tracking technologies to monitor and communicate the whereabouts of predatory and violent offenders in all environments within the community. Solutions must provide cost-effective, accurate and reliable continuous monitoring and communication of whereabouts in all environments. Highly secure circumvention prevention and detection measures are also required. Must locate on x, y and z coordinates; that is, in addition to latitude and longitude, the technology must be able to determine what floor the offender is on within a multi-story building. Priority is tracking offenders in compromised locations.

TWG Recommended Outcomes

Increased accountability of the offender and increased confidence in the technology, which should lead to more use of the technology as an offender management tool to support alternative to incarceration programs and offender re-entry initiatives.

RANKING: 7

Corrections

TWG Recommendation

Improved Contraband Detection Technologies

Description of Issue/Requirement/Need

Introduction of contraband presents a serious problem for correctional facilities. Weapons, drugs and other contraband compromise the security of an institution, create black markets and negatively impact the correctional environment. In addition, staff, inmate and public safety are compromised. To combat this, corrections personnel require technologies for use at egress and ingress points that will integrate and improve existing methods of detecting a broad spectrum of contraband such as, but not limited to, metallic and nonmetallic weapons, drugs, tobacco and wireless communication devices. Portal devices must safely and nonintrusively detect contraband carried on the body and within body cavities; provide rapid through-put; be user-friendly in operation and maintenance; and, most importantly, be affordable enough to be a viable solution for most correctional agencies. Emphasis shall be placed on technologies that improve capabilities to search within body cavities.

TWG Recommended Outcomes

Significant decrease in the amount of contraband introduced into a typical correctional facility.

RANKING: 8

Information Led Policing

TWG Recommendation

Establish a Common CJIS Software Platform to Collect and Analyze Data

Description of Issue/Requirement/Need

Develop an extensible common criminal justice information system baseline software platform available to all law enforcement/corrections agencies to collect and analyze criminal justice data. Invest in the establishment of a no-cost, centrally hosted criminal justice software baseline. Increase the number of system capabilities available to all criminal justice agencies to improve the availability, analysis, and quality of information available to law enforcement/corrections officers.

Smaller state and local criminal justice agencies do not have the necessary funding and resources to establish and support a baseline criminal justice software capability that allows them to take full advantage of critical law enforcement data. Many existing criminal justice software systems do not provide the ability to invest in software plug-ins/extensions that could be leveraged by other agencies with limited costs.

TWG Recommended Outcomes

1) Incrementally identify the available free criminal justice software components and identify how those components can be utilized to form a criminal justice baseline and what gaps exist in that baseline. 2) In the near-term, reduce acquisition and annual maintenance costs by making available a configuration controlled

software platform that is available free of charge to criminal justice agencies with a mechanism for contributing new plug-ins and extensions. In the long-term, increase the number of available capabilities available in the baseline and provide an easy method for retrieval, submission of plug-ins/extensions, configuration control and installation/maintenance documentation.

RANKING: 9

School Safety

TWG Recommendation

Resource Portal Technologies

Description of Issue/Requirement/Need

There is a need for a clearinghouse for school safety information. There is no open clearinghouse for school safety information.

TWG Recommended Outcomes

Documentation of trends that can be disseminated to the school safety community. Monthly or quarterly topics of interest to be provided in a Web-based format for users to logon and discuss the current issues (allow the TWG to determine the subjects for each session and to place together the relevant material for that subject).

RANKING: 10

DNA Forensics

TWG Recommendation

Tools for Mixture Interpretation of Casework Samples

Description of Issue/Requirement/Need

A validation kit to be used for this purpose is still desired. Datasets (not samples) needed. Need profiles (various kits/platforms/triallelic samples, etc.). Need raw data for labs to process. It may be possible to explore with NIST or Forensic Technology CoE. Tools to interpret three-persons (or more) mixtures is still a priority.

DNA lab analysts need a system that can perform quantitative interpretation of STR data from mixtures of two or more individuals. Should be able to calculate ratios on three-person mixtures. Should work on partial STR profiles and degraded DNA samples. Should be Web-based and compatible with LIMS (Laboratory Information Management Systems).

2010 Update: Emphasis more on mixtures. Current systems not good for more than two individual mixtures. Tru Allele needs to be assessed; still in development, has best approach, a nonbiased way of looking at mixtures, but gives up speed of resolution. Needs development of new systems, current systems need to be assessed and improved. Standardization of mixture interpretation. Keep as high status. Evaluation of existing programs and consider setting up a test bed similar to that done for database laboratories except that these programs would be used to supplement the interpretation step in the process rather than replacing it. This would be done with the newly released SWGDAM guidelines. May have some applicability to Y STRs as well. Noted as super high status by standard practices breakout group; this is one of the top two high-priority needs designated by the 2010 TWG.

TWG Recommended Outcomes

More standardized and quantitative output for mixture interpretation, requiring less analysts time. Expedited review of DNA profiles leading to higher throughput of forensic DNA analyses.

RANKING: 11

Body Armor

TWG Recommendation

Revise the Existing NIJ Standard for Ballistic Helmets (0106.01)

Description of Issue/Requirement/Need

The current version of this standard was published in 1975. This standard needs to be updated to reflect current ballistic threats, test methods, research into blunt trauma impact effects, etc. While wearing ballistic helmets, officers often are subject to strikes from objects such as bats or clubs. A nonpenetrating ballistic strike can also have a blunt trauma impact. NIJ may decide to combine both the ballistic helmet standard and the riot and face shield standard.

TWG Recommended Outcomes

Near-term outcomes: 1) Research into head injuries resulting from blunt trauma impact on a helmet; 2) requirements and test methods that address blunt trauma resulting from nonpenetrating rounds, specifically development of a validated test method that is applicable to blunt trauma injuries sustained when wearing helmets; 3) requirements that address nonballistic impacts such as fit and impact resistance. Long-term outcome: 1) Increased officer safety and reduction/elimination of blunt trauma injuries.

RANKING: 12

Communications

TWG Recommendation

CAD Interface

Description of Issue/Requirement/Need

The CommTech TWG voiced a concern over the issue of disparate CAD systems between agencies and remains interested in identifying solutions and standards to mitigate future problems. Issues include inability to exchange data seamlessly (and in real time) between disparate systems; fusion center issues; development of COPLINK (RMS) evolved from TWG coordination; development of intelligent software – standards-based information (voodoo layer) that forces it to other systems; interface standards of new systems.

TWG Recommended Outcomes

1) Investigate if a standard currently exists, 2) if not, establish one, 3) implement a mandatory requirement that the standard be a part of the standard CAD base, 4) make it a requirement that it be included in the next generation 911 specs.

RANKING: 13

General Forensics

TWG Recommendation

Research on the Foundational Aspects of Pattern and Impression Evidence

Description of Issue/Requirement/Need

The criminal justice community needs research on the foundational aspects of individualization and the significance of class characteristics for pattern and impression evidence. Issues include the lack of knowledge for prevalence of class characteristics within a population, based on regional, year-to-year, group association (such as gangs); the lack of standardized non-numeric criteria for identification for impression evidence; the lack of knowledge pertaining to the reproducibility of characteristics between impression evidence made with the same item.

TWG Recommended Outcomes

The pattern and impression evidence practitioners will have the necessary statistical studies for reference, which can assist in the determination of the significance of class evidence and perhaps aid in making an individualization.

RANKING: 14

Modeling and Simulation

TWG Recommendation

Modeling Expertise in Specialty Positions

Description of Issue/Requirement/Need

There is no law enforcement specific software or capability (such as a decision-making tool) that allows an agency to model an expert in a given area, such as forensics. There is a need for such a software or capability that does not require development of another new piece of hardware (using iPod technology as such an application for existing technology would be encouraged).

Needed at crime scenes in most law enforcement jurisdictions across the U.S., but especially in small jurisdictions where no specialty position such as a crime scene investigator exists.

Currently, most agencies in the U.S. do not have a full-time forensics employee on staff 24/7 to respond to crime scenes. Because of their inability or ignorance on preserving or collecting evidence, criminal cases are compromised.

TWG Recommended Outcomes

This would serve to assist the investigating officer in ensuring he follows expert protocol to preserve and collect evidence at crime scenes. The ability for this tool to be able to upload and transmit the captured information and images to a remote subject matter expert for real-time assistance is desired.

RANKING: 15

Officer Safety and Protection Technologies

TWG Recommendation

Development of a Retention Holster Standard

Description of Issue/Requirement/Need

Retention holsters do not have an independent standard. Currently law enforcement must depend on the manufacturer to provide a product that meets their needs without a third-party evaluation. There is also a difference in classification across the industry that is or can be confusing to the purchaser of holsters.

TWG Recommended Outcomes

Reduction in officer firearm takeaways by unauthorized individuals. The reduction in takeaways should result in a reduction of officer injuries and deaths from their own firearms. A special technical committee has been developed and the draft standard is in progress. A draft standard has been written and is under review, scheduled to be complete during FY10.

RANKING: 16

School Safety

TWG Recommendation

School Safety Training

Description of Issue/Requirement/Need

There is a need for improved training material and information for the school safety community.

A 2005 NIJ national survey (Abt) found that many school officer programs are addressing many more school safety problems than they were originally established to address. Further, many SROs engage in activities for which they have not been trained, including mentoring and teaching. Furthermore, few programs in the study train SROs adequately before they go on the job; some provide absolutely no training while others do not make it available until SROs have been on the job for as long as a year or more. In addition to the expense, programs often fail to provide timely training because courses are often not available locally during the period between the selection of the new SROs and their first day in the schools.

TWG Recommended Outcomes

Improved training material and access to training material for those who are responsible for school safety.

RANKING: 17

Geospatial Technologies

TWG Recommendation

Captured Calls Information

Description of Issue/Requirement/Need

There is a need for law enforcement agencies to have a text- or spatial query-based search capability to review transcripts of legally monitored communications of incarcerated subjects. Today, detectives are able to legally listen to phone calls made from jails, but many law enforcement agencies are unable to search the information through text or spatial queries. As such, law enforcement loses the criminal

intelligence within communication (e-mails and telephone calls) between inmates and other individuals. This affects the efficiency of all investigations using this information by extending the time spent manually reviewing conversations.

TWG Recommended Outcomes

1) Develop a solicitation to address technology need, 2) the technology will allow law enforcement and corrections to be able to obtain and act on more current intelligence information, 3) the technology needs to be done in multiple languages, colloquialisms and argot.

RANKING: 18

Corrections

TWG Recommendation

Wireless Communication Detection/Defeat Technologies

Description of Issue/Requirement/Need

The introduction and use of unauthorized wireless communication devices creates a serious security concern for corrections. This is an important issue as evidenced by legislation created by a number of states making it a felony to introduce a cell phone into a prison. Inmates use these devices to carry on criminal activities, to facilitate escape attempts, harass victims, intimidate staff, etc. Corrections requires cost-effective technology that eliminates unauthorized wireless communications and/or assists in accurate (x,y,z coordinates) location detection of a broad range of wireless communication, including cell phones, walkie talkies, blackberries, Bluetooth devices and

PDAs. Technology must have the capability to defeat or detect devices based on frequency bandwidth, whether intact or broken down into component parts, whether powered on or not, and should not interfere with desirable radio frequency devices used by staff. System capability should be integrated into a central data and communications infrastructure, be user friendly in operation and maintenance and most importantly be affordable enough to be a viable solution for most correctional agencies.

TWG Recommended Outcomes

Significant reduction and/or elimination of the use of unauthorized wireless communication devices, which would result in the great reduction of associated criminal activity both inside the institutions and in the community.

RANKING: 19

Pursuit Management

TWG Recommendation

Controlling or Stopping Pursuits Using Police Activated Vehicle Intervention Technologies

Description of Issue/Requirement/Need

There is a high probability that the suppression of the vehicle cannot happen quickly (less than one minute) if law enforcement has to go through a command structure. This trial will show the potential of direct intervention

TWG Recommended Outcomes

1) Purchase cell phone intercept equipment, 2) connect to a vehicle that is equipped with OnStar or alike, 3) remotely control parameters, 4) explore other communications paths into the

vehicle such as V2V or R2V or maintenance ports.

Show that direct intervention is possible from the officer's vehicle.

RANKING: 20

Explosives

TWG Recommendation

Continue Development of National Electronic Countermeasure Program

Description of Issue/Requirement/Need

Continuation of the development of the national bomb squad electronic counter measures (ECM) program and the technologies that support it, toward defeating the full range of radio-controlled improvised explosive devices (RCIED) threats.

TWG Recommended Outcomes

The outcome will be a significant improvement to national security resulting from bomb squads having ECM capability to deal with RCIEDs.

RANKING: 21

Sensors and Surveillance

TWG Recommendation

Detect Concealed Weapons and Contraband on an Individual

Description of Issue/Requirement/Need

Fund research and development initiatives to address this technical requirement to detect both

metallic and nonmetallic contraband at a price point of less than \$25,000.

Prevent the introduction of contraband at any controlled access point. Millimeter wave technology is available, but currently is too expensive for law enforcement. Need to determine what technologies/tools are available at any price point and identify legal issues.

TWG Recommended Outcomes

Develop and deploy a successful commercial solution for less than \$25,000.

RANKING: 22

Biometrics

TWG Recommendation

Identification of People From Video and Audio Surveillance

Description of Issue/Requirement/Need

Law enforcement officers need the ability to identify a person through capture of their face and/or voice on audio/video devices, and the related ability to check biometric identifiers against a database. This technology could be used by criminal justice for the following activities:

- Handling school outsider problems (preventing unauthorized access on school campus).
- Identifying employees and inmates moving through a secure or controlled area.
- Identifying and authorizing communications system users through voice recognition.

- Detecting altered appearance.
- Detecting gang activity.
- Identifying inmate speakers during telephone conversations. Criminal justice professionals need an improved audio surveillance technology to positively identify and monitor inmates and other persons of interest during telephone conversations as well as automatically flag phrases and other parts of the recorded discussions for investigative or counterterrorism purposes.

TWG Recommended Outcomes

Projects supported to meet this requirement: 1) Normalization plug-in for improved face recognition of noncooperative Individuals, 2) high-quality 3D facial images from surveillance video, 3) noncooperative 3D face recognition, 4) use of HDTV for in-vehicle cameras and face recognition, 5) effects of varying video sources and quality on face recognition.

RANKING: 23

Body Armor

TWG Recommendation

Revised Stab-Resistant Armor Standard

Description of Issue/Requirement/Need

This standard is based on research and a resulting standard devised in the United Kingdom. There is concern that it is not appropriate for use in the different criminal justice environment of the United States.

TWG Recommended Outcomes

Near-term outcomes: 1) Research into actual weapons used against corrections officers (including plexiglass, metal, wooden, plastic, etc.) to determine types of weapons, dimensions, materials and other details. 2) Testing of weapons to collect data on sharpness, hardness, and other features. 3) Research into locations in facilities where attacks typically occur, location on the body where stabs and slashes are experienced, how attacks occur and differences in attacks by male and female inmates. 4) Identify new backing material and develop an improved penetration depth measurement. 5) Improved test method.

Long-term outcome: 1) An improved standard. 2) An educational video focusing specifically on stab-resistant armor. 3) Improved protection and resulting reduction in injuries and fatalities.

RANKING: 24

Sensors and Surveillance

TWG Recommendation

Cell Phone Jamming/Selective Filtering (Tactical/Mobile Operations)

Description of Issue/Requirement/Need

The law enforcement community needs technology that will prohibit unauthorized wireless communications, or allow law enforcement the ability to selectively filter which communications are allowed, in a defined area. The technology exists, but is cost prohibitive and currently not allowed under Federal Communications Commission regulations.

Investigate legal issues regarding deployment; obtain temporary authority to conduct testing and evaluations; compare cost and performance of jamming vs. detection vs. selective filtering; determine if jamming interferes with public safety/health.

TWG Recommended Outcomes

No unauthorized cell phone usage within a well-defined area.

RANKING: 25

Information Led Policing

TWG Recommendation

Develop Centralized Repository/Resources for Criminal Justice Technologies

Description of Issue/Requirement/Need

Develop a central repository, or criminal justice “store,” where criminal justice personnel can locate, retrieve and access technologies available at no-cost regardless of the Department of Justice agency that funded the development. Invest in the establishment, configuration control, and maintenance of standard criminal justice technology repository/store that allows practitioners to easily locate, retrieve, install and utilize emerging technologies.

Federal agencies invest in technologies to benefit criminal justice agencies. Yet in many cases those technologies are not being utilized effectively by criminal justice agencies due to the lack of knowledge of the availability and to the lack of an easy way to secure the technology.

TWG Recommended Outcomes

Incrementally identify the available no-cost criminal justice technologies and identify what capability each of the no-cost technologies provides to agencies. In the near-term, stand up a centralized store/repository that contains currently available technologies. In the longer term, develop the governance, configuration control, access control and other features that provide the ability for law enforcement agencies to contribute additional plug-ins/features that expand the capabilities available to all criminal justice agencies.

RANKING: 26

Modeling and Simulation

TWG Recommendation

Simulation-Based Training on Operational Guidelines for Commanders

Description of Issue/Requirement/Need

There is no known simulation-based training on the operational application of currently accepted federal publicized guidelines (BJA Police Desk Reference) for command-level law enforcement day-to-day operations (e.g., Sim City for Police).

There is very limited practical application phase for upper-level law enforcement management at a low-cost alternative. On-the-job training is not conducive to the work demands of a lead administrator; efficient operations of a public safety agency require learning best practices prior to application in the field with real-life consequences. Concerns: Can the software be scalable to agency size; can the end-user import specific policy/procedures for their jurisdiction

to include jurisdictional boundaries? What will the learning curve be for nontechnically trained managers and what level of acceptance will current senior level administrators have for this type of technology?

TWG Recommended Outcomes

1) More efficient at daily operations, 2) decrease vicarious liability, 3) less adverse impact on the community they serve, 4) smoother transitions due to lessons learned, 5) learning curve is decreased, 6) develops more efficient decision-making skills (cognitive thinking).

RANKING: 27

Community Corrections

TWG Recommendation

Secure Positional Location Devices for Offenders

Description of Issue/Requirement/Need

The community corrections field requires research and development of technologies for positional location devices to detect intentional signal blocking/jamming.

Current location and tracking technology systems are vulnerable to offender tampering, which can compromise the integrity of these systems. The community corrections field requires research and development of technologies for positional location devices to detect intentional signal blocking/jamming.

TWG Recommended Outcomes

The outcome will provide the criminal justice system with a higher degree of confidence in

offender tracking systems, which should translate into increased usage.

RANKING: 28

DNA Forensics

TWG Recommendation

Physical Separation of Cells

Description of Issue/Requirement/Need

Remains a high-priority need. A method that can eliminate the need for differential extraction is still desired.

A device that can physically separate and quantify various types of cells (epithelial, sperm, etc.) would be of value in the analysis of DNA evidence. Cells can be separated by size or can be tagged (e.g., fluorescently) to allow physical separation. The tags must not affect downstream DNA analysis. The method must be successful on typical forensic samples (e.g., limited in size, presence of contaminants, etc.). Cell sorters (e.g., flow cytometry) are commonly found in diagnostic laboratories, but a forensic device is not available. Spring 2010: Remains a high-priority need. A method that can eliminate the need for differential extraction is still desired. Noted as “super high” status by nonstandard practices breakout group; this is one of the top two high-priority needs designated by the 2010 TWG.

TWG Recommended Outcomes

Better resolution of the components of a mixture, including mixtures of samples from individuals of the same gender.

RANKING: 29

Electronic Crime

TWG Recommendation

Digital Evidence Collection Tools for Cloud Computing Environments

Description of Issue/Requirement/Need

Development of tools and technologies to conduct investigations involving data stored in clouds and locate and acquire digital evidence from data storage clouds. Cloud computing is an emerging technology that can be accessed and exploited from a variety of computing platforms, including mobile devices and cell phones.

TWG Recommended Outcomes

Enhanced skill sets of the criminal justice community to access and acquire information of investigative value stored using advanced technology that can be adapted to hide evidence from detection and seizure.

RANKING: 30

Communications Technologies

TWG Recommendation

CAD Data Standards (i.e., Location Information)

Description of Issue/Requirement/Need

Investigate if a standard exists, if not, establish one and implement requirements. Lack of data standards for exchange between disparate CAD systems.

TWG Recommended Outcomes

1) Investigate if a standard currently exists, 2) if not, establish one, 3) implement a mandatory requirement that the standard be a part of the standard CAD base, 4) make it a requirement that it be included in the next generation 911 specs.

RANKING: 31

Geospatial Technologies

TWG Recommendation

Enhanced/Increased Use of Sensor Technologies for Probation, Parole and Re-Entry

Description of Issue/Requirement/Need

The criminal justice community needs enhanced tools to exploit geospatial data and sensor technologies to manage and supervise offenders during probation, parole and re-entry. Criminal justice practitioners are not exploiting geospatial data and sensor technologies to full effect for managing or supervising offenders. Currently, there is inefficient use of existing resources to effectively manage and supervise the offender population.

TWG Recommended Outcomes

1) Develop a solicitation to address technology need. 2) The technology would optimize offender monitoring resulting in more efficient use of criminal justice resources and enhancing public safety. 3) The technology would be practitioner friendly.

RANKING: 32

Less Lethal

TWG Recommendation

Near Instantaneous Effect on Human Targets

Description of Issue/Requirement/Need

Law enforcement and corrections officers need a technology that would provide a repeatable, near-instantaneous, less-lethal effect on a human target. This technology would be used to deliver an effect at a long stand-off distance to one or two individuals located in a group or crowd without collateral effects to others who are nearby. Current less-lethal technologies do not have the capability of delivering instantaneous and precise effects at a long distance. For example, two technologies that have demonstrated promise are the directed energy (DE) systems: millimeter wave (RF/MMW) and infrared lasers (IR/LASER).

Monitoring manufacturer efforts, including untethered EMD devices TASER XREP, TASER 40mm, and LEKTROX 40mm. Also, DoD is now engaged in similar efforts to reduce the device size and increase portability of DE. Funding operational trial of the Assault Intervention Device (AID) by Raytheon and the Los Angeles Sheriff's Department through the Weapons and Protective Systems Technologies Center of Excellence, including evaluation of the device in the operational setting to determine its impact on reducing inmate assaults, lessening the severity of such assaults, enabling more rapid intervention by jail staff and/or any combination thereof. Other current projects

partially addressing this need are: 2004-IJ-CX-K035 (Solid State DE LL Portable Brassboard) 2004-IJ-CX-K043 (Pulsed Laser).

TWG Recommended Outcomes

This technology will provide a tool with which officers can resolve hostage situations with reduced injury and death to officers, victims and subjects. Additionally, as these systems become more affordable, it is desired that some DE systems will replace the kinetic energy impact systems by partially filling those needs described in Kinetic Energy Impact Munition Improved Range and Precision/Accuracy Systems (LLD-2006-R03).

REQUIRED RESPONSE(S): Immediate immobilization (movement or redirection) at extended distances that is fully recoverable in two to five minutes; immediate disruption of ability to sense and interpret information with full recovery; immediate full compliance (behavior change).

RANKING: 33

Less Lethal

TWG Recommendation

Oleoresin Capsicum (OC) Product Labeling and Testing Standard

Description of Issue/Requirement/Need

The criminal justice community needs a standard to which OC products are tested as well as a methodology for testing, to verify that the contents are both safe and consistent with labeling of the product and NIJ-approved standards. One example is that some OC

containers are labeled nonflammable or CEW safe and have been found to catch fire after used in conjunction with a CEW device. Labeling standards and testing standards are necessary for all modalities and forms of OC. This includes organic and OC or Pepper Spray and other riot control agents (RCAs), which have been found to vary among manufacturers in contents and corresponding labeling. RCAs generally have accompanying manuals that describe contents, but these are not necessarily accessible enough. OC derivatives are an exception, as the organic variety varies in strength and contents of additives.

TWG Recommended Outcomes

This operationally based requirement seeks to ensure full and accessible disclosure of product ingredients by manufacturers; provide a means of monitoring and oversight of products marketed to the criminal justice community; and facilitate officer recognition of contents through standard labeling. The outcome will be safer products (no extraneous accelerators or enhancers in products without full disclosure); officers will see more consistent effects; officers will more readily recognize content formulae and strengths through standardized labeling.

RANKING: 34

General Forensics

TWG Recommendation

Research on the Examination and Conclusion Process

Description of Issue/Requirement/Need

The criminal justice community needs additional research on the examination and conclusion

process. There is lack of research on the criteria for the determination of value for comparison and identification/exclusion purposes; and lack of research on the ranges of conclusions, standardization of conclusions based on examiner training and experience effects, facility accreditation or examiner certification.

TWG Recommended Outcomes

The community will have research that provides a foundational basis for assigning value to a particular comparison (identification/exclusion) and it provides knowledge about the impact of analyst certification and lab accreditation.

RANKING: 35

Officer Safety and Protective Technologies

TWG Recommendation

Revision of the NIJ Handcuff Standard

Description of Issue/Requirement/Need

The NIJ Standard for Metallic Handcuffs needs to be revised/updated to reflect current restraint technologies and test methods. The current NIJ standard for handcuffs was released in 1982. This standard only addresses a specific size of metallic handcuff. Officers need a standard that addresses various sizes and new technologies, and that will validate on a regular basis that the handcuffs being purchased are the same as the ones tested to the standard.

TWG Recommended Outcomes

Reduction in restraint failures in the field. This in turn should cause a reduction in the number of

escapes by suspects and inmates, as well as in the number of injuries to, and deaths of, officers.

RANKING: 36

Officer Safety and Protective Technologies

TWG Recommendation

Multi-Threat Protection Gloves

Description of Issue/Requirement/Need

There is currently no glove on the market that will give law enforcement protection against stab, slash and pathogen threats and still allow them the dexterity and tactility to perform their mission. The glove needs to allow for performance of day-to-day missions as well as be able to be worn for an entire shift. Decontamination onsite is preferable.

TWG Recommended Outcomes

The gloves should create a reduction in injuries due to punctures and slashes caused by hypodermic needles, razor blades and other sharp objects. The pathogen resistance in the gloves should decrease the chance that an officer will contract some of the diseases they come into contact with while on the job.

RANKING: 37

Geospatial Technologies

TWG Recommendation

Enhanced Crime Analysis Tools to Identify Linked Crimes/Serial Offenders

Description of Issue/Requirement/Need

There is a need for a tool to be developed that would increase efficiency in identifying crime series and serial offenders, and the ability to respond to such in a more efficient manner. Existing tools require the user to initiate queries to discover linked crime. The tool must not be a standalone application that requires data to be exported from source and imported to the tool. The tool cannot be completely automated and separate the analyst from the data under examination. The tool must be for the analysis of continuous data, and not just historical data.

TWG Recommended Outcomes

Develop a solicitation to address the technology need.

RANKING: 38

Modeling and Simulation

TWG Recommendation

Real-Time Voice Recognition and Language Translation Tool

Description of Issue/Requirement/Need

Patrol officers and corrections personnel encountering Spanish and other non-English-speaking persons are unable to effectively and

efficiently communicate with each other. A technology or tool is needed that would enable real-time voice recognition and language translation. Limited/no communication with a non-English speaking individual and/or delayed response for a translator to arrive on scene compromises officer safety and efficiency in investigating time-sensitive matters.

Misunderstandings on scene with non-English speaking individuals could result in errors in judgment and decision-making, which creates a liability situation. Concerns include: legal issues; a record capability could be a plus; ability to receive updates; ability to understand slang; a noted limited capability in the beginning is recognized, but there is an expectation that the capability would increase with updates; capability may already exist; size and usability (ruggedness) are of concern.

TWG Recommended Outcomes

Ability of law enforcement and corrections personnel to communicate in real-time with Spanish and other non-English speaking individuals, improving the communication and resulting in better decision-making by personnel on the scene.

RANKING: 39

Corrections

TWG Recommendation

Inmate and Tracking Location Technology

Description of Issue/Requirement/Need

There is a need for technologies to provide “real time” location and tracking of incarcerated subjects. In order to effectively control a

correctional facility it is imperative that staff be able to monitor the whereabouts of inmates throughout a facility. This provides management with the ability to monitor and control movement, prevent congregation of inmates, etc. This is particularly important in light of the Prison Rape Elimination Act (PREA), which seeks to prevent, detect, respond to and monitor sexual abuse of inmates. Corrections personnel require cost-effective technology that can locate and track offenders in real-time throughout a facility. At a minimum, the technology shall alert staff on predefined parameters such as “keep separates”; unauthorized absence from approved areas; unauthorized presence in areas; and shall maintain data that is archivable/searchable. The technology should be nonproprietary, based on open standards, highly accurate (able to locate inmates within 10 feet on x, y and z coordinates), highly reliable, and able to be integrated into a central data infrastructure. Technology must be user friendly in operation and maintenance and, most importantly, be affordable enough to be a viable solution for most correctional agencies.

TWG Recommended Outcomes

Outcomes will be better tracking of STG groups/activity that should lead to significant reduction in associated criminal activity and institutional infractions; a decrease in sexual assaults; a significant increase in successful criminal prosecutions; a significant reduction in escapes and in the event that an escape occurs, more rapid apprehension. An additional outcome will be more effective/efficient staff deployment.

RANKING: 40

School Safety

TWG Recommendation

Best Practices Guides/Lessons Learned

Description of Issue/Requirement/Need

There is a need for a School Safety “Best Practices/Lessons Learned” guide. There is a lack of available information on implementation of school safety technologies other than that made available by vendors.

TWG Recommended Outcomes

Documentation of trends, etc., that can be disseminated to the community.

[Actions Taken: May 31, 2010. Efforts are underway by the Weapons and Protective Systems CoE to complete a school safety “Practitioner Perspectives” guide, a school safety video/documentary entitled “It Can Happen Here,” and a rewriting of parts of the Sandia National Labs school safety best practices guide.]

RANKING: 41

Sensors and Surveillance

TWG Recommendation

Cell Phone Detection (Tactical/Mobile Operations)

Description of Issue/Requirement/Need

Law enforcement agencies need the ability to identify and control phone activity within areas of interest. For use in mobile, tactical operations;

need to safeguard operational security and ensure officer and public safety; need ability to identify and control phone activity within areas of interest. Commercially available tools do more than is needed, may require carrier support, and have no economies of scale; need automated, distilled version at a lower price.

TWG Recommended Outcomes

Determine if tools are currently available.

RANKING: 42

Body Armor

TWG Recommendation

Define Trauma Plate/Pack/Inserts Performance Test Methods

Description of Issue/Requirement/Need

The law enforcement and corrections community needs better information about the performance of these types of protection. Trauma plate technology is changing and agencies need to be sure they are buying appropriate equipment. There is ongoing confusion about whether these offer additional ballistic protection and/or blunt trauma protection.

TWG Recommended Outcomes

Near-term outcome: 1) Standardized definitions for each type, 2) standardized test methods, 3) guidance in this area in the selection and application guide. Long-term outcome: Improved officer safety.

RANKING: 43

DNA Forensics

TWG Recommendation

Body Fluid/Cell Type Identification

Description of Issue/Requirement/Need

The forensics community needs improved methods for unambiguously determining the tissue source of biological evidence.

Biological evidence is frequently a combination of various cell types/body fluids (e.g., sperm/semen, vaginal epithelial cells/vaginal fluid, oral epithelial cells/ saliva). DNA lab analysts need a confirmatory method for determining which components are present in the biological evidence. There is preference for an automated assay (in a kit format), especially if it were part of a multiplex. Ability to identify sperm is a high priority within this need. Still is considered a high priority need; this technology could be assessed if methods exist that would be beneficial to the community if made available in a commercialized kit.

TWG Recommended Outcomes

Improved methods for unambiguously determining the tissue source of biological evidence, potentially resulting in 1) a probative investigative lead in cases where the specific body fluid/cell type provides probative information regarding the circumstances surrounding a criminal act, 2) assisting the DNA analyst in determining the appropriate subsequent analytical processes.

RANKING: 44

Explosives

TWG Recommendation

Integration of Bomb Squad and SWAT Teams in Dynamic Takeover Situations

Description of Issue/Requirement/Need

There is a need for better collaboration and integration between bomb squad and tactical response (SWAT) teams, particularly in dynamic “take over” situations that may involve the use of explosives.

Currently, many bomb squads and tactical teams are separate entities in their own agencies.

Develop the ability for bomb squads to provide render-safe support to tactical teams in dynamic takeover-type situations, including operational studies to identify tactical and technical points of opportunity to insert technological solutions.

TWG Recommended Outcomes

Integrate training so that both teams can work together. The outcome will be an improvement to national security resulting from bomb squads being prepared for terrorist takeover situations in which they must work effectively with SWAT teams.

RANKING: 45

General Forensics

TWG Recommendation

Research to Determine Accuracy in Order to Address the Error Rate Issues in *Daubert*

Description of Issue/Requirement/Need

Research is needed to determine accuracy in order to address the error rate issues in *Daubert*. Accuracy can be defined by the applicant. There is a lack of studies that examine the error of individual examiners, and a lack of understanding of error rates pertaining to collection issues, examination or analytical processes, verification issues or technical review issues.

TWG Recommended Outcomes

An understanding of how the processes involved in impression and pattern evidence collection, examination, analysis, verification and technical review can contribute to error rate.

RANKING: 46

Communications Technologies

TWG Recommendation

Cellular Detection, Location, Isolation and Defeat

Description of Issue/Requirement/Need

There is a law enforcement need for technology and techniques to detect, identify, classify and locate wireless communication devices. In addition, there is a need for an ability to first identify, then legally isolate, defeat and control cellular or other wireless communications connections within a controlled environment for emergency law enforcement applications. This includes techniques other than jamming that can be used with or without active participation of cellular systems carriers. There is also a need for corrections to detect the unauthorized use of cellular phones, or limit general cellular phone use to selected outbound emergency or other

authorized numbers in certain environments (for example, in a controlled environment, such as a prison, penitentiary or jail complex).

TWG Recommended Outcomes

Provide a way to identify, then legally isolate, defeat and control cellular or other wireless communications connections within a controlled environment for emergency law enforcement applications. This should include techniques other than jamming that can be used with or without active participation of cellular systems carriers. Include remote areas and smuggling operations.

[Upgraded from medium priority to high in fall 2009. The CommTech TWG reaffirmed the need to detect and control the use of wireless communications devices, such as cell phones. In the TWG's discussion on this topic, the TWG added a desire to identify any wireless communication device within a controlled environment (i.e., wireless hot spots with VoIP connections). For example, technology development in cooperation with the licensed cellular system operators.]

RANKING: 47

Pursuit Management

TWG Recommendation

Analysis of Pursuit Data

Description of Issue/Requirement/Need

The law enforcement community needs better analysis of pursuit data so as to better understand the details of what actually occurs during a pursuit. Research is needed on how

pursuits start and end, and documentation is needed of injuries related to pursuits.

Exploration of existing databases, such as the Fatal Accident Reporting System and the International Association of Chiefs of Police's (IACP) Pursuit Incident Database, could provide a starting point.

The objectives of this project are to 1) conduct comprehensive statistical analysis on the existing IACP Pursuit Management Database to identify and uncover possible common patterns, relationships and causality effects of events; 2) create a Pursuit Management Technology database by performing a limited national survey of relevant agencies and industry participants in order to collect information on the available commercial and off-the-shelf and in-service technologies that are in use and/or under development for pursuit management; 3) develop and compile a working glossary of terms and definitions associated with pursuit management terminology.

TWG Recommended Outcomes

The desired outcome is to advance an understanding of specific pursuit scenarios so that the law enforcement community can further focus training and technology to assist tactics, techniques and procedures. The TWG recommended funding an academic research entity to reduce the data collected in the IACP and California pursuit databases. This effort is currently underway as a function of the research partnership between the WPSTC and the Thomas D. Larson Pennsylvania Transportation Institute (LTI).

RANKING: 48

Biometrics

TWG Recommendation

Expedited Capture of Latent and Rolled Equivalent Fingerprints and Palm Prints

Description of Issue/Requirement/Need

Criminal justice professionals need technologies to speed up the collection of latent and rolled finger and palm prints in the field and convert them to a digital format for comparison in an AFIS.

Examples of uses for this technology include inmate processing; border security checks with Automated Criminal Justice Information System (ACJIS); and background security checks for employee clearance. Criminal justice professionals need a device that can collect latent fingerprints and palm prints in the field and convert them to a digital format for comparison in an AFIS. The TWG noted that no deployed commercial off-the-shelf technology currently exists to perform rapid (10 rolled in under 15 seconds) collection of finger and palm prints.

TWG Recommended Outcomes

Projects supported to meet this requirement were the subject of the NIJ solicitation for Fast Capture Finger/Palm Print Technology. Projects funded included: 1) Cross Match Technologies - Flexible Foil Contact Sensor; 2) TBS North America-Segment Imaging; 3) Carnegie Mellon University - Hand Shot ID; 4) University of Kentucky - Four fingers and Thumb short.

RANKING: 49

Community Corrections

TWG Recommendation

Alternative Tethering for Positional Location Devices for Offenders

Description of Issue/Requirement/Need

There is a need for improved/alternative options for tethering a tracking device to an offender. Current location and tracking technology does not offer many options in terms of tethering the tracking device to the offender. Existing options often consist of bulky equipment that readily identifies the subject as an offender. The community corrections field requires research and development of technologies for alternative tethering technologies that are secure and provide an alternative more conducive to offender re-entry efforts than a large device strapped to an ankle.

TWG Recommended Outcomes

Outcome would be more options for offender tracking that are sensitive to potential individual needs, vocational issues, juveniles, stigma, etc.

RANKING: 50

Electronic Crime

TWG Recommendation

Network Intrusion Investigation and Network Forensics Tools and Technologies

Description of Issue/Requirement/Need

Development of tools and technologies to investigate electronic crime involving computer networks and conduct forensic examination of networked computers, devices and components for information of evidential value.

Most computers are connected to local area networks (LANs) or wide area networks (WANs). Valuable information regarding connections, activities and remote data storage locations can be recovered from network computers and components.

TWG Recommended Outcomes

Assets that will improve the performance of electronic crime investigators and digital evidence examiners providing them the tools, protocols and knowledge to identify, acquire and incorporate network communication data into investigations and examinations.

RANKING: 51

Information Led Policing

TWG Recommendation

Perform Research on Use and Impact of Social Media by Criminal Justice Agencies

Description of Issue/Requirement/Need

Perform an evidence-based study of the effectiveness of the capture, processing and delivery of communication between the criminal justice community and the public using new technologies.

Invest in an evidence-based study that assesses the effectiveness of communications between

the criminal justice community and the public using new and emerging methods. With the influx of social media, Web 2.0 technologies and the abundance of devices such as iPhones, Blackberries and other smart phones, many communities are starting to look at communication with the public safety community differently. Currently, an evidence-based study does not exist that the criminal justice community can use to determine whether or not this use of technology will be beneficial.

TWG Recommended Outcomes

In the short term, perform an analysis of the new ways in which government agencies are communicating with their constituencies and determine the operational effectiveness of that communication. Perform a pilot project that assesses the use of the most promising communication methods between law enforcement/corrections and the public. Perform an evidence-based operational assessment using data collected during the pilot project. Longer term, develop an operational guide to assist law enforcement/corrections policy makers in determining the operational outcomes and cost benefits to be achieved through information sharing.

RANKING: 52

Officer Safety and Protective Technologies

TWG Recommendation

Study the Safety of Mounted Equipment Inside a Vehicle During a Vehicle Accident

Description of Issue/Requirement/Need

Information is needed on the effect of vehicle crashes on mounted equipment inside a patrol vehicle, including laptop mounts, radar mounts, and any other after-market equipment installed inside the vehicle that may harm vehicle occupants. Information also is needed on ergonomic effects of position and usage of equipment mounted inside a patrol vehicle.

TWG Recommended Outcomes

Expand NIJ patrol vehicle evaluations, to include proper mounting of additional (after-market) equipment required for patrol operations. Documentation is available from Chevrolet, Dodge and Ford indicating safe zones where equipment can be mounted and not interfere with or hamper either the active or passive safety devices built into vehicles, and should be reviewed for inclusion of the NIJ vehicle study. At the same time, safety devices must show a substantial decrease in the number of job-related injuries (e.g., back strain, carpal tunnel) requiring therapy or medical intervention.

RANKING: 53

Less Lethal

TWG Recommendation

Less Lethal Force Effects-Based Study

Description of Issue/Requirement/Need

The criminal justice community needs independent scientific evaluation of less-lethal devices that employ valid data based on actual operational environments.

Using data taken from actual field conditions provides a meaningful analysis unable to be duplicated in laboratory conditions. Moreover, revelations are expected on rates of success, innovative applications and other factors that are not captured or are underreported in other types of studies. Among other things, such a study will provide critical information for measuring effectiveness, comparing options under different environmental conditions, identifying trends and anomalies, determining typical engagement ranges, assessing risks and anticipating injuries. One suggested method is to use a phased approach with an initial effort focused on gathering existing force data already captured in police reports and databases and expanding the study with additional information after standardizing definitions, amalgamating database fields and other collaborative measures.

OPERATIONAL SCENARIO(S): All BASIS RESPONSE(S): N/A This is a new requirement (spring 2010). The TWG recommends funding this study with a requirement to maintain connectivity to the TWG membership throughout the study period.

TWG Recommended Outcomes

Informed decisions require law enforcement planners and decision-makers to be knowledgeable about effectiveness, risks, engagement ranges, environmental conditions, and other critical factors associated with less-lethal devices in actual field conditions and not extrapolated from laboratory analysis. When all relevant factors are clearly understood and taken into account, measures can be taken to reduce injuries and deaths, focus training and reduce civil liability. The findings resulting from this

study will provide realistic and meaningful comparisons for law enforcement executives in the selection and deployment of less-lethal options in a variety of actual field conditions.

LECTAC History

Since its inception in the mid-1970s, the advisory body now known as LECTAC has provided valuable advice to NLECTC and the law enforcement and corrections community. The council has not only helped bring new technologies into practice, but also has ensured that NIJ does not pursue inappropriate technologies.

History

LECTAC has a long history that began nearly 30 years before the establishment of the TWG process. In 1977, the National Institute of Law Enforcement and Criminal Justice (NILECJ), NIJ's predecessor agency, recognized that the law enforcement community needed independent, accurate information and technical assistance to help with the equipment procurement process. NILECJ funded the International Association of Chiefs of Police (IACP) to establish and operate the Equipment Technology Center (ETC) to provide this information and assistance; prior to its establishment, law enforcement agencies relied on the untested claims of product manufacturers and/or the other opinions of consumers. (Experience had demonstrated that more often than not, neither of these sources provided reliable information.) In order to ensure that the ETC testing programs met law enforcement's needs and requirements, NILECJ and IACP established the National Advisory Committee for Law Enforcement Equipment and Technology (NACLEET). IACP appointed NACLEET members, based on their knowledge and expertise in specific areas, with the approval of the Law Enforcement Assistance Administration (LEAA) and NILECJ.

In 1979, Congress passed the Justice System Improvement Act of 1979, signed into law by President Jimmy Carter; this act converted NILECJ into NIJ. NIJ issued a new grant to the IACP that converted the ETC into the Technology Assistance Program (TAP) and created the Technology Assessment Program Information Center (TAPIC) to serve as the clearinghouse for law enforcement technology and equipment information. To reflect the changes, NACLEET was renamed the Technology Assessment Program Advisory Council (TAPAC).

In 1985, NIJ awarded the operation of TAP and TAPIC to another grantee, ending eight years of operation by IACP. Recognizing that IACP remained an integral resource for the law enforcement community, a seat for an IACP representative was established on TAPAC. Then as now with LECTAC, many sitting TAPAC members also belonged to IACP.

As a result of the Violent Crime Control and Law Enforcement Act of 1994, NIJ converted TAPIC into the National Law Enforcement Technology Center (NLECTC), which served as a hub for several regional centers throughout the country in addition to maintaining its previous testing and information center resources. These NLECTC regional centers were established as "centers of excellence" in various technology-focus areas and also acted as regional interfaces for law enforcement agencies. Once again, to reflect the changes in the program, TAPAC was renamed, this time as the Law Enforcement Technology Advisory Council (LETAC).

In 1995, NIJ, recognizing that the corrections community also had an urgent need for technical assistance for equipment and technology procurement, renamed NLETC the National Law Enforcement and Corrections Technology Center (NLECTC) and broadened the focus of the program to include the corrections community. LETAC became the Law Enforcement and Corrections Technology Advisory Council (LECTAC) and was restructured into two committees for law enforcement and corrections. Both committees had parallel subcommittee structures and reported to an executive committee, comprised of the chairs of the respective subcommittees. The various regional centers established their own regional advisory councils.

In 1997, the LECTAC Executive Committee, in an effort to reduce overlapping (and sometimes conflicting) requirements from the two committees, as well as to include input from the regional advisory councils, requested that NLECTC-National initiate an effort to consolidate and streamline LECTAC and the regional advisory councils. The result, approved by the LECTAC Executive Committee in April 1998, consolidated the law enforcement and corrections committees into one body. The subcommittee structure was realigned into nine technology focus areas, and each subcommittee has representatives from both law enforcement and corrections agencies. To improve communication among the regional centers, their advisory councils and LECTAC, the directors of each NLECTC regional center and the chair of each regional center advisory council are now a part of the LECTAC Executive Committee.

LECTAC's structure continued to experience minor adjustments over the next several years. In late 2004, NIJ initiated a comprehensive restructuring of LECTAC and the process by which technology requirements were identified and prioritized. The subcommittee structure of LECTAC was disbanded and replaced with 17 Technology Working Groups, each one corresponding to an active technology portfolio within NIJ. The responsibilities for managing these TWGs were assigned to the various NLECTC Regional Centers who were tasked with a TWG's corresponding technology portfolio. The TWGs were then tasked with developing the specific technology requirements for their areas of expertise.

LECTAC was restructured into a smaller (approximately 35-40 member) executive advisory body, tasked with reviewing and prioritizing the inputs received from the TWGs. LECTAC is administered by NLECTC-National, located in Rockville, Md., and meets at least annually to review the TWGs' recommendations.

Whether known as NACLEET, TAPAC, LETAC or LECTAC, the mission and purpose has remained consistent over the years: to provide NIJ with practitioner-based input on the technology needs of state and local law enforcement, corrections, crime laboratory and criminal justice agencies.

Through this process, LECTAC seeks to further the identification, development and implementation of new technologies that advance the operations of criminal justice agencies and ensure the safety of law enforcement and corrections personnel in the performance of their duties.

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