



## **Officer Safety**

### **Research, Technology Development, and Standards**

Brian Montgomery, Physical Scientist  
Operational Technologies Division  
National Institute of Justice  
COPS Conference 2011  
Washington, DC  
August 2nd, 2011



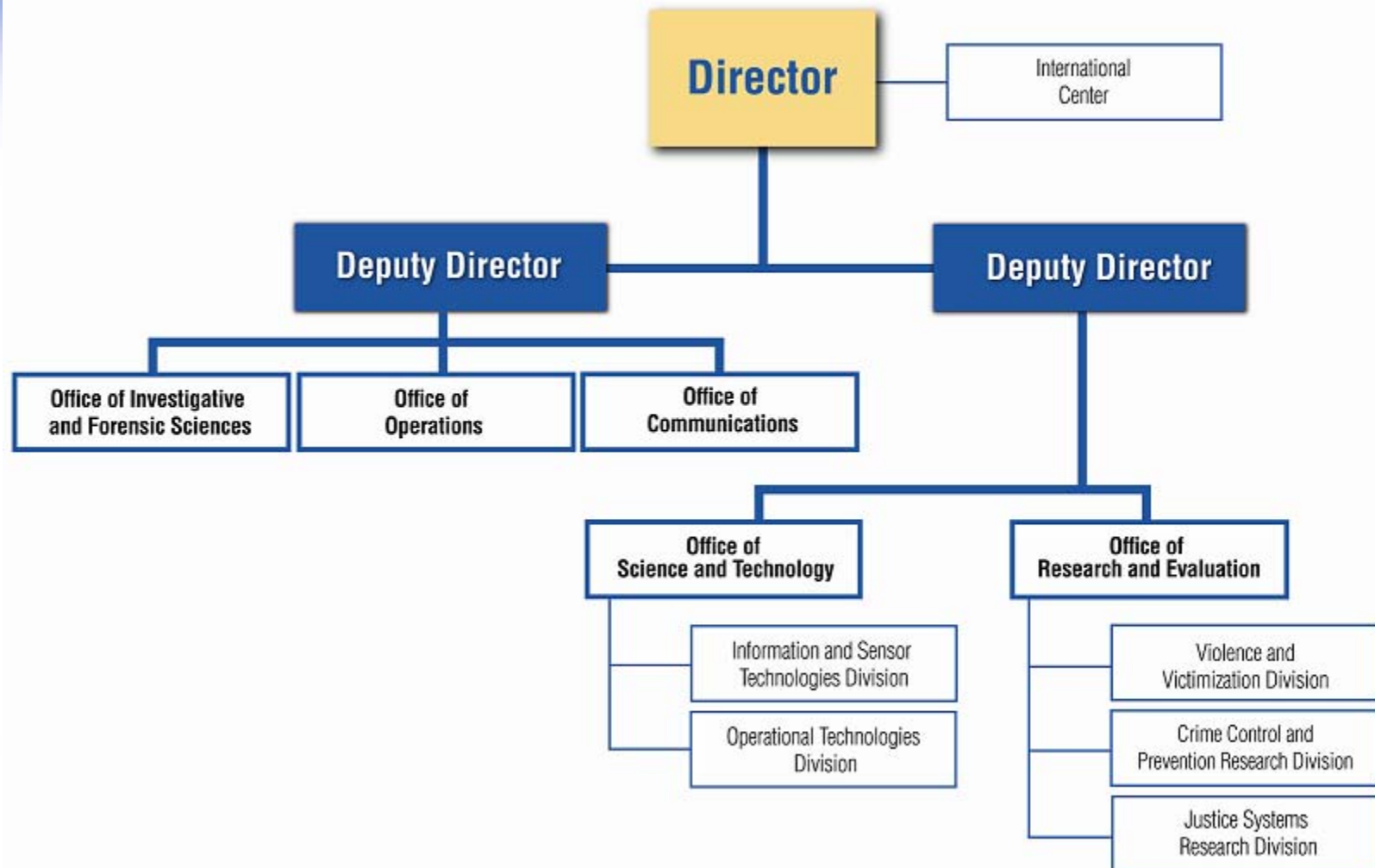


## NIJ's Mission

- NIJ's principal authorities are derived from the Omnibus Crime Control and Safe Streets Act of 1968, as amended (see 42 USC § 3721-3723) and Title II of the Homeland Security Act of 2002 as it relates to NIJ's Office of Science & Technology (OS&T)
- Research, development and evaluation arm of the Department of Justice
- Advances scientific research, development, and evaluation
  - to enhance the criminal justice (CJ) system
  - to increase public safety
- Emphasis on State and local practitioner needs
- Committed to scientific process of open competition, peer-reviewed, published reports and archived data



# NIJ Organization





# Office of Science & Technology (OST) Manage Technology Research and Development

Biometrics  
Less Lethal Technologies  
Communications Tech  
Corrections (Institutional,  
Community)  
Body Armor  
Court Technology  
Electronic Crime



Information Led Policing  
Geospatial Technologies  
Modeling and Simulation  
[Officer Safety and Protective Technologies](#)  
Pursuit Management  
School Safety  
Sensors and Surveillance

Explosives Detection and Remediation



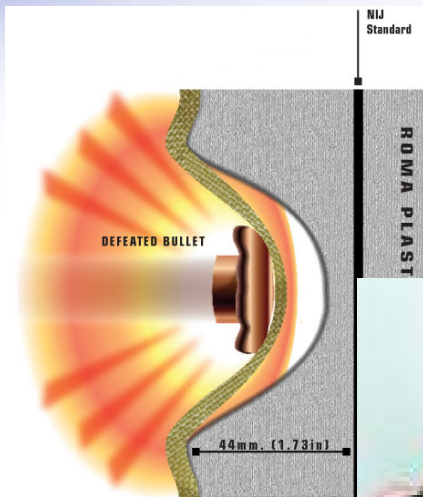
## Mission of the Operational Technologies Division



- Manage Research and Development efforts in various technology areas.
- Identify technology requirements.
- Manage the development of standards, testing methods, and guides and operation of NIJ's Compliance Testing Program.
- Administer, Manage, and Coordinate efforts with the National Law Enforcement and Corrections Technology Center System
- Provide technology information and assistance.



# Officer Safety – Research Projects



Behind Body Armor Blunt Trauma Research



Investigation of the Effects of Increased Coverage Area for Soft Body Armor



Shear Thickening Fluid Application in Body Armor



Physical and Environmental Effects on the Performance of Body Armor



# Officer Safety – Research Projects Cont.

NATIONAL LAW ENFORCEMENT AND CORRECTIONS TECHNOLOGY CENTER  
A program of the National Institute of Justice  
From Winter 2008 TechBeat

**TECH** b.e.a.t

Dedicated to Reporting Developments in Technology for Law Enforcement, Corrections, and Forensic Sciences

## No Rest for the Weary

*It's a schedule all too familiar to many in public safety. Night shift ends at 8 a.m. Court begins a short time later, with no time for sleep in between. By the time court is over, it's time to pick up the youngest child after school. An hour later it's time to take the oldest to soccer practice. Then it's dinner time, and in a few short hours, it's back to work.*

*For a day or two, even a few more, most people in good health can keep pace with that kind of schedule. But as the months and years go by, lack of proper rest can really take its toll. So says Bryan Vila, a former law enforcement officer who is a professor at Washington State University in Spokane and a pioneer of research into how fatigue affects police officers.*

Vila and several of his colleagues are making plans to create a laboratory setting where officers, intentionally deprived of sleep, will test their shooting, driving, and other skills when drowsy. These plans call for equipment such as deadly force decisionmaking and driving simulators, peripheral awareness monitors, communications equipment, and exercise machinery, all of which will be used to test officers' judgment and physical skills. Subjects will be deprived of sleep for 24 hours or more and will be tested wearing full uniforms and gear to make the simulations as realistic as possible.

Vila speaks several dozen times a year to law enforcement agencies and organizations about the profound

performance and attentiveness. Vila notes that studies of military personnel from Walter Reed Army Medical Center indicated that soldiers who went 48 to 72 hours without sleep lost none of their marksmanship skills. Their ability to distinguish appropriate targets, however, did become impaired. Other studies show that individuals deprived of sleep for 24 hours exhibit the same level of physical impairment as persons with a .10 blood alcohol level.

Short-term effects of sleep deprivation include worsened mood, decreased awareness, impaired physical and cognitive functioning, and reduced ability to deal with stress," Vila says. "When an individual builds up a sleep debt, it takes several days or more of increased sleep to erase it. Also, poor sleep generates worse sleep in a vicious cycle, leading to long-term effects such as profound fatigue, which can reduce officer safety, health, and performance."

A large body of research shows that the vast majority of people need 7 to 8 hours of sleep each night with a minimum requirement of 6.5 hours average to avoid sleep deprivation. Shift work, overtime, swing shifts, and "moonlighting," all common in the law enforcement and corrections community, also interfere with establishing good sleep habits. Studies by Vila and his colleagues have shown that—

## Fatigue Research - No Rest for the Weary

AY 2011

NIJ

Research in Brief

Police Use of Force, Tasers and Other Less-Lethal Weapons

www.nij.gov

## Police Use of Force, Tasers and Other Less-Lethal Weapons



## Officer Safety – Research Projects Cont.



Optimized Placement of Mounted Equipment within Patrol Vehicles during Side Impact Crashes



Evaluation of the Effectiveness of Alternative Lighting, Paint and Retro-reflective Material Schemes on First Responder Vehicles



Officer Safety and Vehicle Emergency Lighting





# Officer Safety - Technology Development



Multi-purpose Threat Gloves



Tactical Officers' Full-Face Respirator

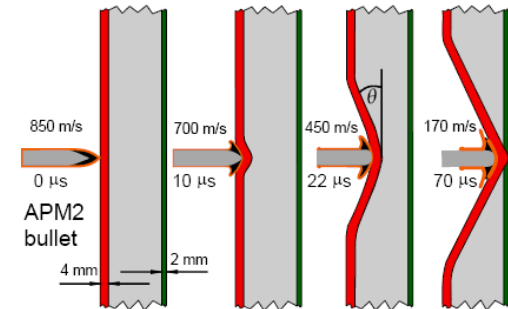


Early Police Uniform



Today's Police Uniform

Multi-purpose and Multi-threat Protection Material for Duty Uniform for Law Enforcement and Corrections Officials



Design Optimization of Integrated Multi-Ply Armors by a Computational Tool (DO-IMPACT)



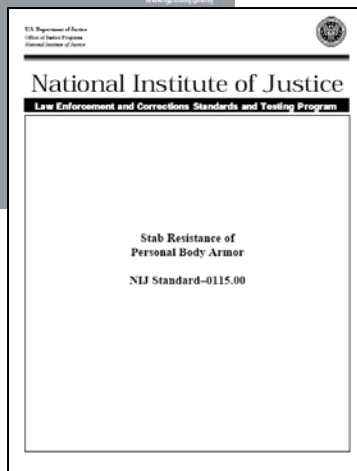
Portable Decontamination of Weapons/Equipment



# Officer Safety - Standards



Ballistic Resistance and Stab Resistance Body Armor Standards



Bomb Suit Standard



CBRN Protective Ensemble Standard for Law Enforcement



Walk-through and Hand-held Metal Detector Standards



## Officer Safety - Standards



Restraints Standard



Duty Holster Standard



Ballistic Helmets

# JUSTNET

The screenshot shows the JUSTNET website interface. At the top left is the JUSTNET logo and the text "Justice Technology Information Network". Below this is a navigation menu with categories such as Aviation, Biometrics, Body Armor, Communications, Corrections, Court Technologies, Crime Mapping, CyberCrime, Equipment Programs, Explosives, Forensics, Information Technologies, Less-Lethal Technologies, Personal Protective Equipment, Pursuit Management, School Safety, Sensors and Surveillance, and Warrants and Testing. The main content area features a "Buyer Beware" article about body armor, a "JUST RELEASED" section with "JUSTNETNews Alerts", and a "TechBeat" section with various articles. A sidebar on the right contains a calendar for July 2011, "JUSTNET VIDEOS", and a "FUNDING ASSISTANCE" section.

JUSTNET provides information on the Regional Centers and Centers of Excellence (COEs) and offers links to other technology sites, including the Body Armor Compliance Testing Program, and publications such as TechBeat. JUSTNET currently provides a myriad of online collaboration tools and forums for information sharing among NIJ, NLECTC System staff and practitioner-based groups, such as NIJ's Technology Working Groups (TWGs) and the Law Enforcement and Corrections Technology Advisory Council (LECTAC). It also offers a form for individual practitioners to submit their technology needs and requests.

More information can be found at [www.justnet.org](http://www.justnet.org)



## Contact Information

Brian Montgomery

NIJ Officer Safety and Protective Technologies

Program Manager

[brian.montgomery@usdoj.gov](mailto:brian.montgomery@usdoj.gov)

202-353-9786