



Communications Research for Law Enforcement Responders

ISART July 2012

Joe Heaps





Disclaimer

- These are my words
- These words are not for quote or attribution
- These words are not necessarily the words of the U.S. Department of Justice

Mission

- Research, development and evaluation agency of the U.S. Department of Justice
 - Provides objective and independent knowledge and tools to reduce crime and promote justice
 - Focus is on the state and local level

OFFICE OF JUSTICE PROGRAMS

NATIONAL INSTITUTE OF JUSTICE
Research • Development • Evaluation

ABOUT NIJ | WHAT'S NEW | ALL TOPICS A-Z | CONTACT US | RSS

Advanced Search

HOME | FUNDING & AWARDS | PUBLICATIONS & MULTIMEDIA | EVENTS | TRAINING | TOPICS

FEATURED TOPIC

All Topics A-Z
Corrections
Courts
Crimes and Prevention
Drugs & Crime
Forensic Sciences
Law Enforcement
Standards & Testing
Technology & Tools
Tribal Crime and Justice
Victims & Victimization

DETERMINING THE AGE OF HUMAN REMAINS

Traditional radiocarbon dating is applied to organic remains between 500 and 50,000 years old. Now, forensic scientists have started to apply carbon-14 dating to cases involving recent human remains. Measuring carbon-14 levels in human tissue could help forensic scientists determine age and year of death in cases involving unidentified remains.

Read the *NIJ Journal* article [Applying Carbon-14 Dating to Recent Human Remains](#).



©Veer (see [reuse policy](#)).

DIRECTOR'S CORNER

- Collaborating on Forensics with Australia



WATCH & LISTEN

- Research for the Real World Seminars
- NIJ on YouTube
- All NIJ Media

Featured Media: Keeping officers safe on the road



HIGHLIGHTS

▼ PREVENTING TEEN DATING VIOLENCE

Based on an NIJ-funded evaluation, the "Shifting Boundaries" program to reduce dating violence and sexual harassment among middle school students has been rated as a promising program on CrimeSolutions.gov.

- [View the CrimeSolutions.gov program evaluation.](#)
- [Read the full report \(pdf, 322 pages\).](#)
- [Learn more about teen dating violence.](#)

The NIJ CONFERENCE 2012

June 18-20
Arlington, Virginia

NIJ Conference 2012 – Turning to Science

With more than 50 sessions, our annual meeting is an intersection of policy, practice and research. Register now.

Learn more about the conference and sign up to receive updates.

See highlights from 2011.

National Child Abuse Prevention Month

Visit www.childwelfare.gov/preventing/preventionmonth

Share This Widget

April is National Child Abuse Prevention Month. NIJ research helps understand the effects of abuse and prevent its occurrence.

▶ NIJ Journal Now Released

▶ NIJ's Standards and Testing Program

▶ SANE Program Evaluation

STAY CONNECTED





NIJ Authority

- **Crime Act of 1968**
- **Homeland Security Act of 2002**



Location



DEPARTMENT OF JUSTICE

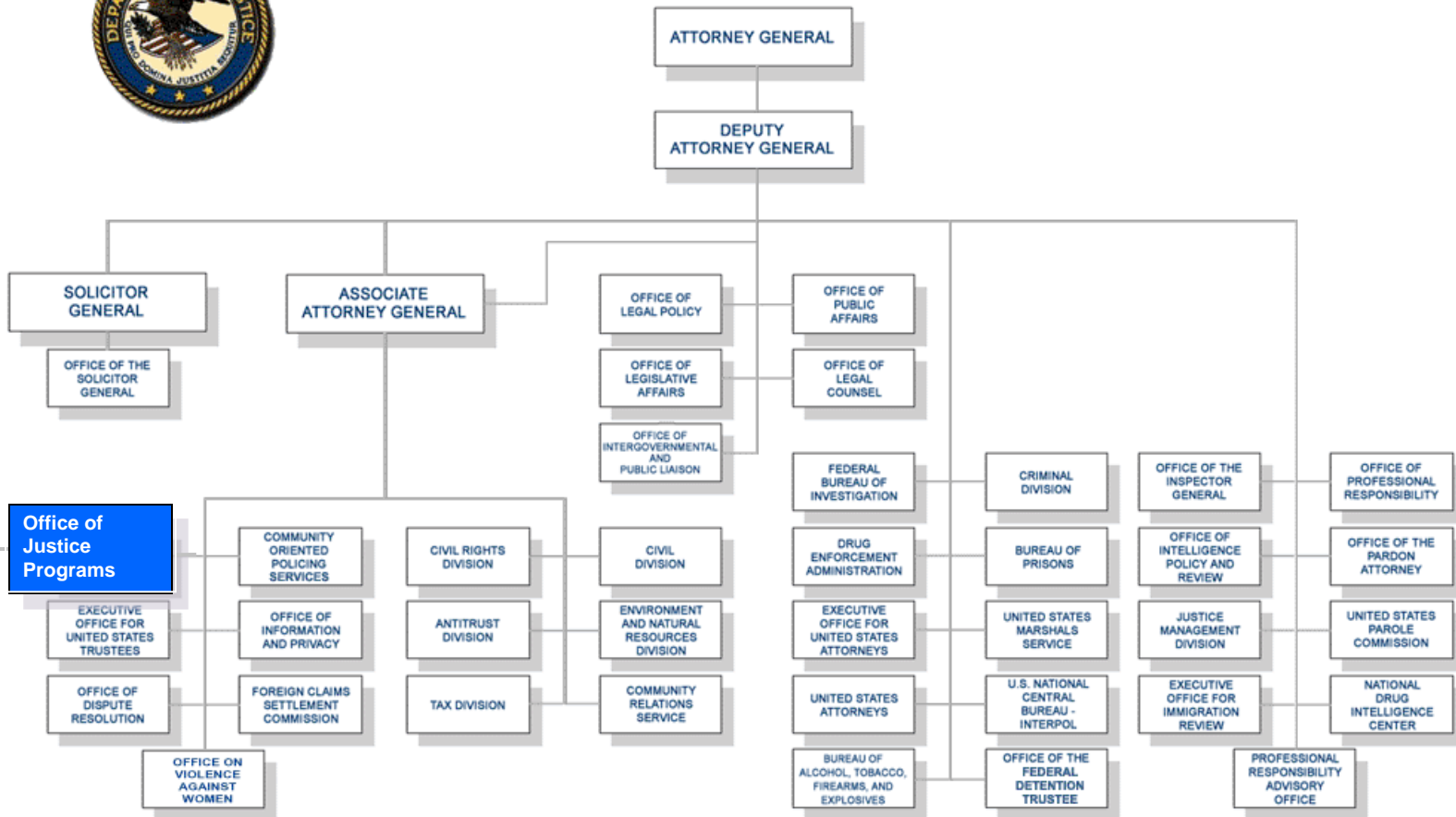
National Institute of Justice

Bureau of Justice Assistance

Bureau of Justice Statistics

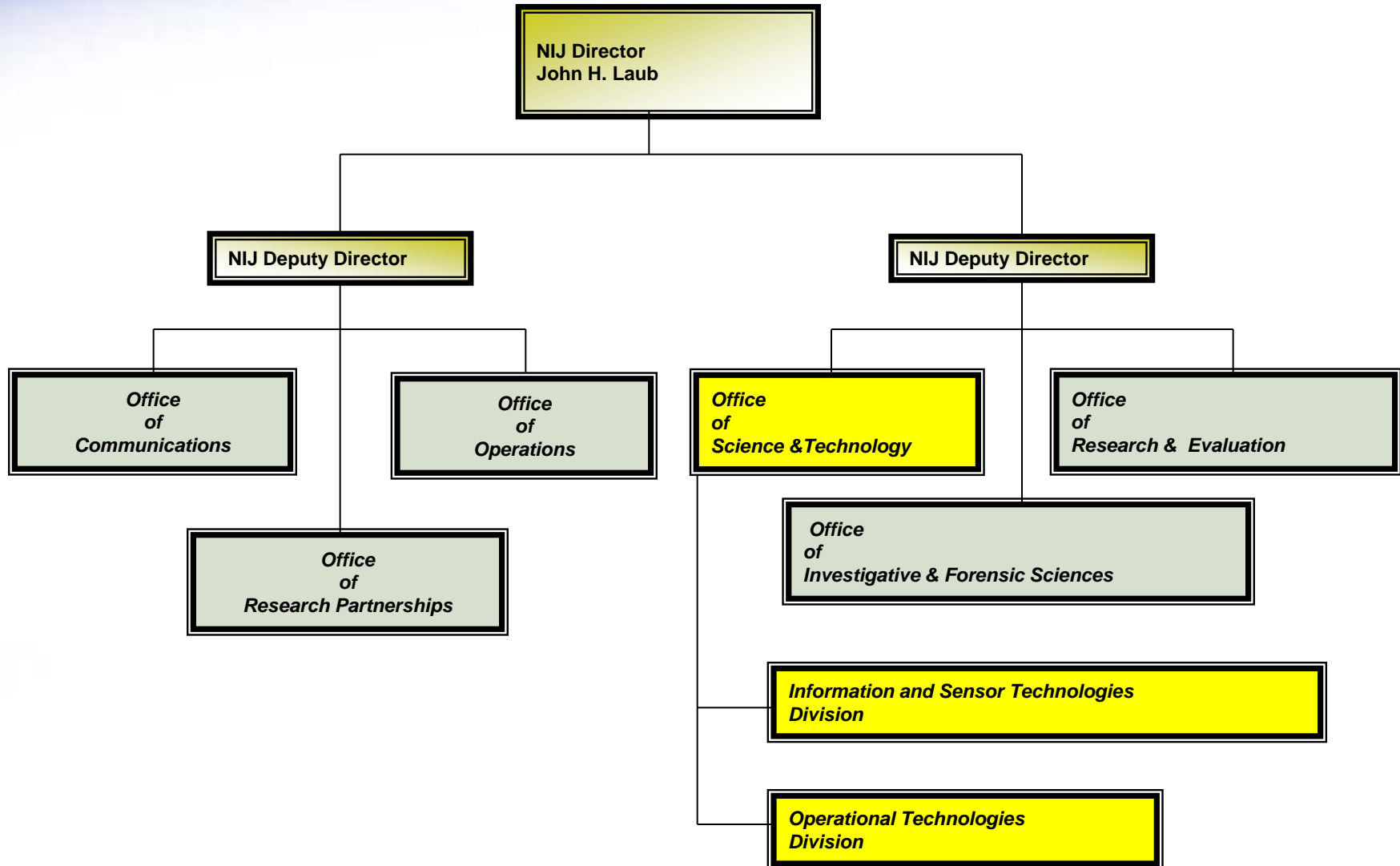
Office for Victims of Crime

Office of Juvenile Justice and Delinquency Prevention





Organization





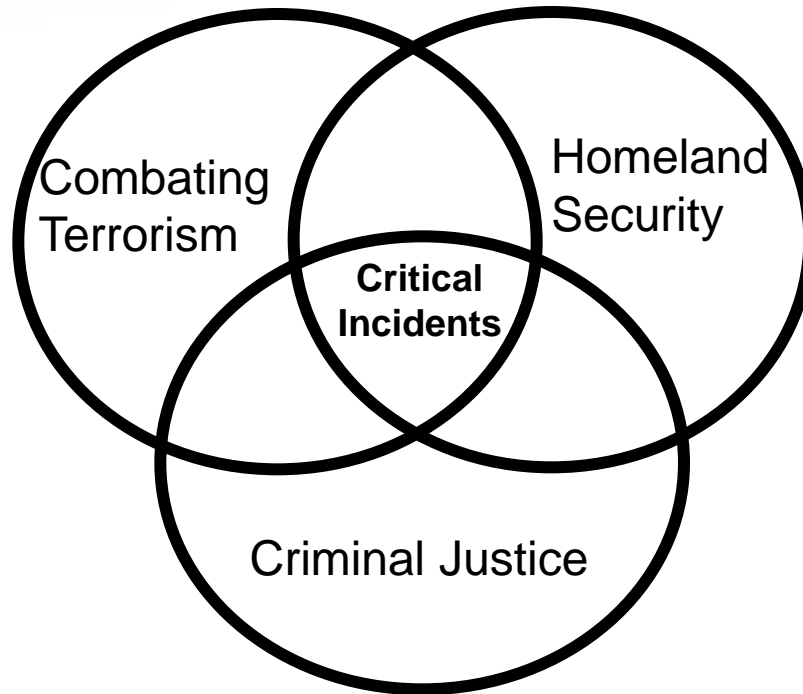
My Customers

- Federal, state, local and tribal criminal justice agencies
 - Nearly 20,000 law enforcement agencies
 - Nearly 4,700 sheriff's departments
 - Nearly 850,000 sworn officers
 - 63 state corrections agencies
 - Nearly 3,000 jails
 - Over 1,000 prisons
 - 430,000 corrections officers
 - Over 400 crime laboratories
 - Courts, probation & parole, etc.
 - Public safety community at-large
- Policymakers, researchers, the American public





NIJ's Role In Homeland Security





Technology Investments



Sago System ST-150
(remote weapons
detection camera)



Avon Protection Systems
(law enforcement tactical
respirator "NIJ 53")



Virginia Tech
Public Safety
Cognitive Radio



Warwick Mills
(multi-hazard
protective gloves)



VanguardAllen
Digital Vanguard
(bomb robot)

Brijot Imaging
System BIS-WDS
(remote weapons
detection camera)





Standards and Testing

U.S. Department of Justice
Office of Justice Programs
National Institute of Justice

DEC. 07

NIJ

Law Enforcement and Corrections Standards and Testing Program
NIJ Standard-0603.01

Portable X-Ray Systems for Use in Bomb Identification

U.S. Department of Justice
Office of Justice Programs
National Institute of Justice

NOV. 2010

NIJ

STANDARDS

CBRN Protective Ensemble Standard for Law Enforcement
NIJ Standard-0116.00

U.S. Department of Justice
Office of Justice Programs
National Institute of Justice

MARCH 2012

NIJ

STANDARDS

Public Safety Bomb Suit Standard
NIJ Standard-0117.00

NIJ.gov

U.S. Department of Justice
Office of Justice Programs
National Institute of Justice

JAN. 03

NIJ

Law Enforcement and Corrections Standards and Testing Program
NIJ Standard-0601.02

Walk-Through Metal Detectors for Use in Concealed Weapon and Contraband Detection

U.S. Department of Justice
Office of Justice Programs
National Institute of Justice

JULY 08

NIJ

STANDARDS

Ballistic Resistance of Body Armor
NIJ Standard-0101.06

www.ojp.usdoj.gov/nij



Policy and Practice

U.S. Department of Justice
Office of Justice Programs
National Institute of Justice

JUNE 05

NIJ

Special REPORT

Mass Fatality Incidents:
A Guide for Human Forensic Identification

www.o

The CUTTING EDGE of TECHNOLOGY

OFFICE OF JUSTICE PROGRAMS

NATIONAL INSTITUTE OF JUSTICE
Research • Development • Evaluation

ABOUT NIJ | WHAT'S NEW | ALL TOPICS A-Z | CONTACT US

Advanced Search GO

HOME | FUNDING & AWARDS | PUBLICATIONS & MULTIMEDIA | EVENTS | TRAINING | TOPICS

[NIJ Home Page](#) > [Topics](#) > [Law Enforcement](#) > [Law Enforcement Investigations](#) > [Crime Scene Guides](#) > [Bomb and Explosion Scenes](#)

BOMB AND EXPLOSION SCENES

- [Arriving at the Scene](#)
- [Evaluating the Scene](#)
- [Documenting the Scene](#)
- [Processing Evidence at the Scene](#)

A Guide for Investigating Bomb and Explosion Scenes

Bombs and other explosions can cause chaos and tragedy. First responders and investigators at these scenes must be meticulous — from arranging for emergency medical care for victims, to locating the site of the explosion, to identifying the explosives used in the bombing.

This guide describes best practices for responding to and investigating an explosion and bombing scene. These include:

- [Arriving at the scene.](#)
- [Evaluating the scene.](#)
- [Documenting the scene.](#)
- [Processing evidence at the scene.](#)
- [Completing and recording the scene investigation.](#)

Follow Agency Policies!
Actions taken following these guides should be performed in accordance with department policies and procedures and federal and state laws.

Jurisdictional, logistical or legal conditions may preclude the use of particular procedures contained herein.

Call in Help!
For potentially devastating situations, such as biological weapons or radiological or chemical threats, contact the appropriate agencies.

> [See also Safety Equipment and Tools.](#)

Next section: [Arriving at the Bomb and/or Explosion Scene.](#)

Date Created: June 1, 2009

SITE & PAGE TOOLS

- Text size:
- [Print this page](#)
- [E-mail this page](#)
- [Feedback](#)
- [Subscriptions](#)

DOWNLOAD THE INVESTIGATIVE GUIDES

- [Crime Scene Investigation \(pdf, 58 pages\)](#)
- [Electronic Crime Scene Investigation \(Second Edition\)](#)
- [Fire and Arson Scene Evidence \(pdf, 73 pages\)](#)
- [Guide for Explosion and Bombing Scene Investigation \(pdf, 64 page\)](#)
- [Death Investigation \(pdf, 64 pages\)](#)

CREATING THESE GUIDES

NIJ's Crime Scene guides were created by multidisciplinary technical working groups of content area experts from across the United States. [Learn more.](#)

ELECTRO-MUSCULAR DISRUPTION TECHNOLOGY

A NINE-STEP STRATEGY FOR
EFFECTIVE DEPLOYMENT



The National Institute of Justice

Communications Technology Research Program



Strategy

- Work with my customers to prioritize research requirements
- Award, competitively, independent projects to address these prioritized research requirements
- Accept proof of concept demonstration capabilities from researchers
- Port each research capability onto reference architecture
- Provide integrated capability to facilitate analysis
- Iterate and expand testing from bench to field to selected users for operational evaluation
- Integrate other R&D activities for operational evaluation



A subset of Public Safety RF Issues and Opportunities

Security

Smartphone

Multiband Radio

Datacasting

Disaster Response

700/800 MHz Regional Frequency Planning

Interoperability

Broadband Data

700 MHz
4.9 GHz

Streaming Video

P-25

Contraband Cell Phone

Software Defined Radio
Cognitive Radio

Multiband Over the Air
Programming/Rekeying

TV White Space



Technology Working Group (TWGs)

- Group of 12-20 members representing mid-level practitioners of differing types of criminal justice organizations/agencies, different geographical regions, different job functions, etc.
- Homeland Security Act of 2002
 - OS&T mission includes serving as the national focal point for law enforcement technology.
 - To carry out its mission, OS&T shall establish and maintain advisory groups to assess law enforcement technology needs



NIJ Competitively-funded Communications R&D

- Cognitive radios
 - To provide waveform recognition, reconfiguration, and interoperability
- Cognitive control of reconfigurable antennas
 - For enhanced coverage, interference mitigation, and power management
- Channel bonding across heterogeneous networks
 - For enhanced spectrum capacity and management



Integration Task

- These independent research efforts were conducted to develop and demonstrate reliable, affordable, flexible, and spectrally efficient public safety and criminal justice communications tools.
- The products of these independent activities provided proof of concept devices and associated software.
- Our next task is to work to integrate the delivered functionalities into a unified research architecture and prototype for further research and operational demonstration and evaluation.



Integration Status

- Establish an area for integration
- Deliver competitively awarded prototype functionalities
- Adopt a standards-based, open source near-term hardware architecture design
- Software integration has begun



The National Institute of Justice

Technology Operational Evaluation Demonstration (TOED) Program



Technology Operational Evaluation Demonstration (TOED) Program

- Objective: Assess the operational impact of new communications technology
- Compare pre- and post-deployment metrics to derive quantitative results
- Impact on operations
- Business model

Interested in others' experience in operational evaluation.



Broadband Wireless Access (Brookline MA Police Department)

ISSUE:

Can a wireless broadband network operating in the licensed public safety band of 4.9 GHz bring value to the Brookline, MA Police Department?

APPROACH:

- Initial study of technology implementation and business model
- Analysis of organizational performance data before and after implementation

RELEVANCE:

- Identify quantitative impact on agency operations of broadband wireless data access—lessons learned for NPSBN
- Identify characteristics of business model

NEXT STEPS:

- Channel bonding evaluation



Managed Access for Contraband Cell Phone Mitigation (MS Dept. of Corrections)

ISSUE:

Unauthorized cell phone use in a corrections environment. One technology recently deployed in Mississippi is a managed access system connected with the commercial cellular network.

APPROACH:

- Initial study of technology implementation
- Analysis of organizational performance data before and after implementation

RELEVANCE:

- Identify quantitative impact on agency operations of managed access technology

NEXT STEPS:

- Evaluate alternative approaches



Over the Air Programming via Broadband (North Carolina State Highway Patrol)

ISSUE:

Can broadband networks be leveraged to provide a significant cost and time savings in reprogramming radios?

What is the impact to operations?

APPROACH:

- Analyze current reprogramming time and cost
- Conduct evaluation based on current approaches and new approach using over-the-air capabilities (WiFi for evaluation)

RELEVANCE:

- Analyze time (and cost) impact on agency
- Analyze how approach maps to NPSBN

NEXT STEPS:

- Extend to federal and other responders (e.g., national Guard)



Contacts

Joe Heaps

Communications Technology – Program Manager

NIJ Office of Science & Technology

(202) 305-1554 // Joseph.Heaps@usdoj.gov

Dr. Nancy Merritt

Senior Policy Advisor, National Institute of Justice

(202) 305-8748 // Nancy.Merritt@usdoj.gov



Questions?