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Technological Responses to Police Problems
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Introduction and Purpose

• Describe challenges in police technology adoption and use

• Frame police technology within the Problem-Solving model

• Employ gunshot detection technology as a case study

• Identify opportunities to enhance effective technology deployment

• Share lessons learned with each other
Who we are

Urban Institute:
- Justice Policy Center staff of ~60 researchers
- Works in partnership with practitioners
- Generates knowledge that improves CJ policies and practices

Police Foundation:
- National independent non-profit
- Advances policing through innovation and science
- Staff includes former law enforcement officers/executives, research and behavioral scientists, analysts and professional staff
Our Backgrounds

Nancy La Vigne, PhD

- 25+ years experience evaluating policing and CJ programs and practices
- Director of the Urban Institute’s Justice Policy Center
- Founding director of DOJ’s Crime Mapping Research Center
- Evaluations include:
  - Public surveillance systems
  - Body worn cameras
  - Video Analytics
  - Gunshot detection technology
  - Cost-benefit analyses
Our Backgrounds

Deputy Chief Eddie Reyes (Ret.)

- 25-year veteran of Alexandria PD
- Deputy Chief Amtrak
- Sr. Law Enforcement Project Manager – Police Foundation

Technology work includes:

- Small Unmanned Aircraft Systems (sUAS)
- Critical Incident Review (Charlotte-Mecklenburg; Charlottesville)
- Open Data
- GDT
- Community Policing
- Public/private video cameras
- LPR
- Social media
- Integration of multiple technologies into Real Time Crime Center
Who are you and why are you here?

- Name
- Department affiliation
- Technology of interest
Applying SARA to Technology

Scanning

- What is the general nature of the problem the technology can address?
- How will the technology achieve its intended goals?

Analysis

- What are the patterns of crime and criminal behavior?
- What are the typical police responses to them?
- What does the technology require?

Response

- How can the technology be employed to best achieve its intended impact?

Assessment

- Was the technology used according to plan?
- Did the technology achieved its intended goals?
Gunshot Detection Technology: A Case Study

1. Gunfire produces sound waves that expand in every direction.
Acoustic sensors throughout the city listen for the distinctive waveforms that firearms produce. When detected, individual sensors calculate the distance to the sound.

**Distance to sound:** shot location could be anywhere on the circumference of this circle.
Readings from multiple sensors are used to triangulate the location of the shot.

Note: Drawings are schematic
4 Gunfire is verified and transmitted
5 Officers Dispatched
SCANNING

- What is the general nature of the problem the technology can address?
  - Illegal firearms discharges
  - Gun violence
  - Aggravated assault
  - Homicide

- How will the technology achieve its intended goals?
  - Increase the risk of apprehension
  - Reduce response time
  - Identify gun crimes that are not reported
  - Support investigations
  - Enhance community perceptions of police
  - Increase cooperation in investigations, as witnesses
Figure 1. Gunfire Detection Technology Logic Model

**Inputs**
- Real-time gunfire incident alerts
- Ability to link GDT to video surveillance systems
- More extensive details about gunfire incidents (e.g. location, number of shooters)
- Alerts to gun crimes not obtained through calls for service

**Outputs**
- More efficient dispatch of emergency medical personnel
- Decreased police response time to gunfire incidents
- Improved ability to locate gun crime evidence (e.g. witnesses, shell casings)
- Increased awareness when responding to gunfire incidents
- New source of accurate crime data
- Ability to engage with community members unwilling or unable to report gun crime

**Outcomes**
- More efficient connection of victims to medical services
- Increased probability of apprehending shooters
- More efficient gun crime investigations
- More successful prosecutions of firearm offenders
- More accurate crime and predictive mapping analysis
- Improved tactical response to firearms incidents
- Greater police-community interaction to prevent gun crime

**Impacts**
- Fewer gun deaths
- Reduced gun crime
- More efficient allocation of department resources and deployment of preventative patrol
- Improved officer safety
- Improved community perception of police

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ANALYSIS

- What are the patterns of crime and criminal behavior?
  - Where are gun-related crimes occurring?
  - Where do gangs/groups engaged in gun violence reside?
- What are the current responses to the problem?
  - Response to calls for service
  - Ballistics
  - Spatial or predictive analyses
- What does the technology require?
  - Unobstructed acoustics
  - Triangulation
  - Power source
  - Crime analysis capacity
- What training and policies are needed?
  - What partners need to be engaged and educated?
RESPONSE

- Employing the technology in a manner that is most consistent with analysis results
- Where to place sensors?
- How much coverage area
- Overt or covert?
- Community engagement
- Police response
  - GDT calls prioritized?
  - Exit patrol car?
  - Search for shell casings?
  - Seek out witnesses?
  - Analyze GDT alert patterns?
  - Integrate with NIBNS?
ASSESSMENT

- Was the technology implemented according to plan?
  - Ratio of dispatches to GDT alerts
  - Response times
  - Ballistics evidence
  - Crime analyses

- Did the technology achieve its intended goals?
  - Gun-related crimes
  - Calls for service
  - Clearance rates
  - Community sentiment
Applying SARA to other technologies

Scanning

- What is the general nature of the problem the technology can address? How will the technology achieve its intended goals?

Analysis

- What are the patterns of problem the technology is meant to address? What are the current responses to the problem? What does the technology require to operate effectively?

Response

- Where, when, and how should the technology be deployed? What training and policies are needed? What partners need to be engaged and educated?

Assessment

- How to measure whether the technology was implemented as intended? If it achieved its intended impact?
Key Takeaways

- Develop a logic model
- Understand the technology’s requirements
- Invest judiciously but sufficiently
- Deploy in alignment with problem’s concentrations, characteristics
- Unearth the technology’s hidden costs
- Attend to training, buy in of end users
- Develop policies and implement before deployment
- Engage the community
- Measure both inputs and impacts
- Integrate into existing operations, activities
Questions & Follow Up

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