Smarter Public Safety

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Emerging Findings on Technology and Governance to Improve Public Safety

- *What's ahead:* issues that will result from the next iterations of information technologies

- *Staying ahead of the game*: from technology at the center to supporting users at the center
  - Providing displays of information *as needed*
  - With improved governance and processes
  - Ensuring data, security, privacy and civil rights protections

- *Making smart IT investments*: tips and lessons learned

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Examples of Emerging Issues from NIJ's *Future Internet Technologies* Workshop

- Self-driving and flying vehicles – how will we interface with them?

- Internet of Things / widespread cameras – how do we take advantage of the volumes of data? How do we ensure security, privacy and civil rights protections?

- Intelligent agents – which tasks could be automated? Which need tools to help humans?
  - E.g., scene and interview capture; report-writing assistance; prioritizing tasks and workloads

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Some Technologies That Have Received a Great Deal of Recent Attention

Video Analytics
(Ref. NISTIR 8164)

- Capabilities to interpret physical features and activities in video streams

Analyses Matching Features with Identities

- Facial recognition
- License plate recognition

Sensor Fusion

- Capabilities to analyze multiple sensor streams to help make inferences beyond what one can do with a single stream
- Focus on "video plus other sensors"
  - E.g., "move camera to where a shot was detected"

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Four Key Business Cases for Video Analytics & Sensor Fusion

Real-time monitoring
- Crimes & suspicious activity
- Hazards

Video forensics
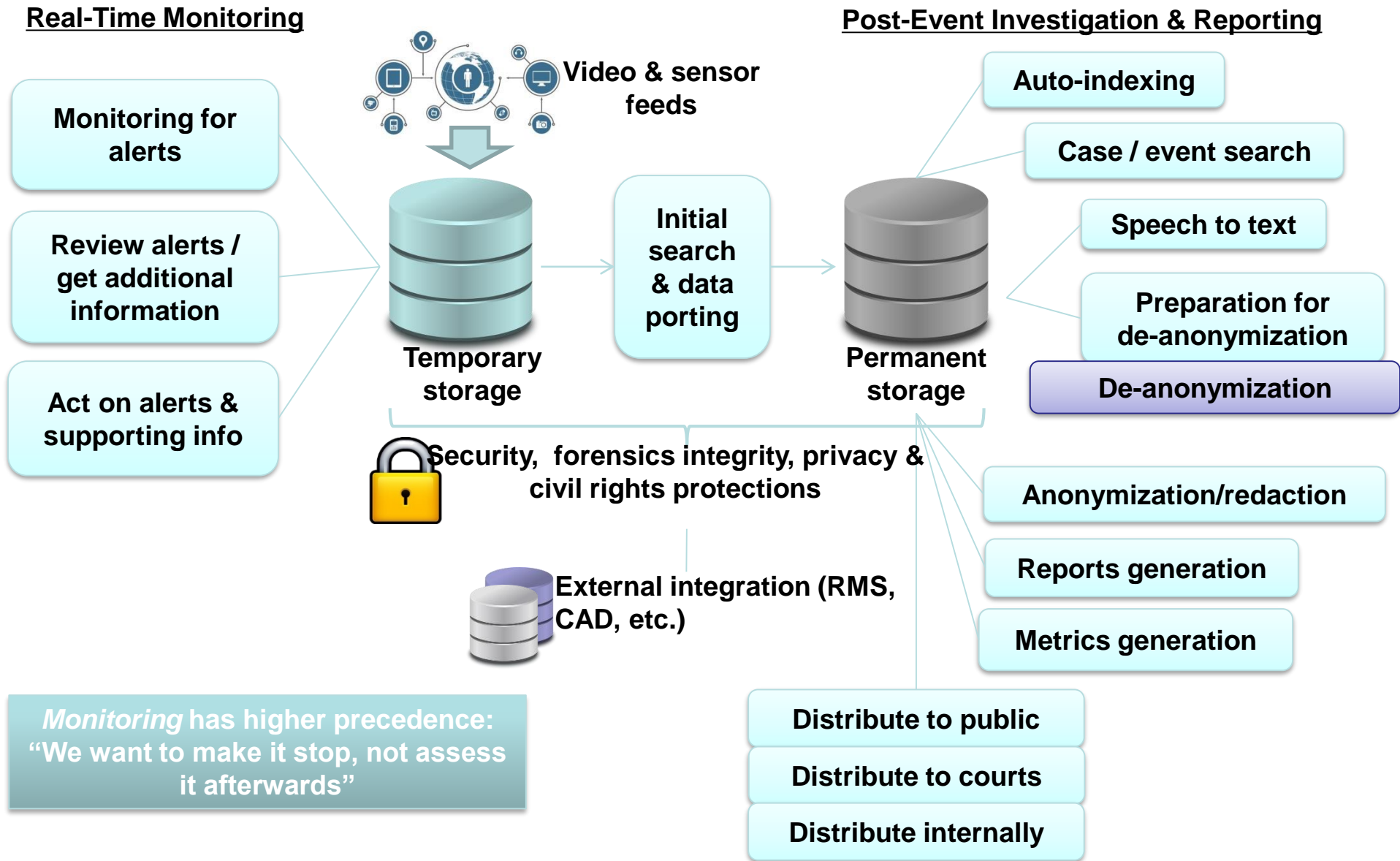- Data management to support investigations

Automatic reporting
- Help describe an event
- Help capture interviews

Performance monitoring
- For individuals
- For agency performance

Crosscutting Cyber, Security, and Civil Rights Protections

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What a Video & Sensor Fusion Network Might Look Like

Real-Time Monitoring

Post-Event Investigation & Reporting

Video & sensor feeds

Monitoring for alerts

Review alerts / get additional information

Act on alerts & supporting info

Temporary storage

Initial search & data porting

Permanent storage

Auto-indexing

Case / event search

Speech to text

Preparation for de-anonymization

De-anonymization

Security, forensics integrity, privacy & civil rights protections

External integration (RMS, CAD, etc.)

Anonymization/redaction

Reports generation

Metrics generation

Distribute to public

Distribute to courts

Distribute internally

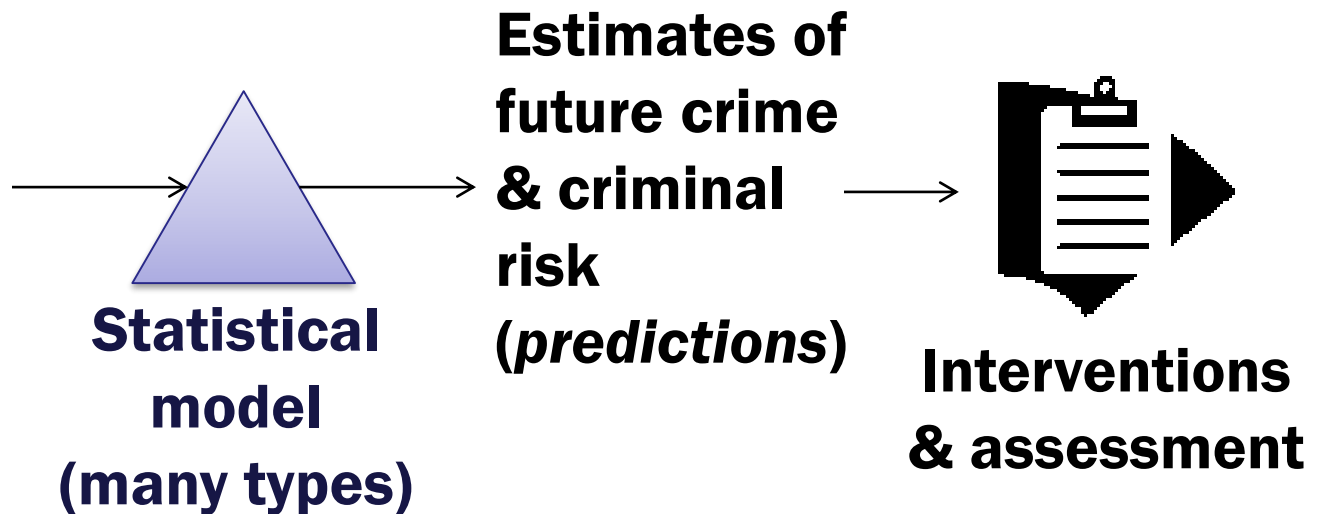*Monitoring* **has higher precedence: "We want to make it stop, not assess it afterwards"**

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A Technology on the Way to SA Policing: Predictive Policing

Input data
May include:
- **Crimes**
- **Disorder calls**
- **Suspicious activity**
- **Field interviews**
- **Time and date**
- **Weather**
- **Geography**
- **Gang intelligence**
- **Criminal histories**
- **Etc.**

Statistical model (many types)

Estimates of future crime & criminal risk (*predictions*)
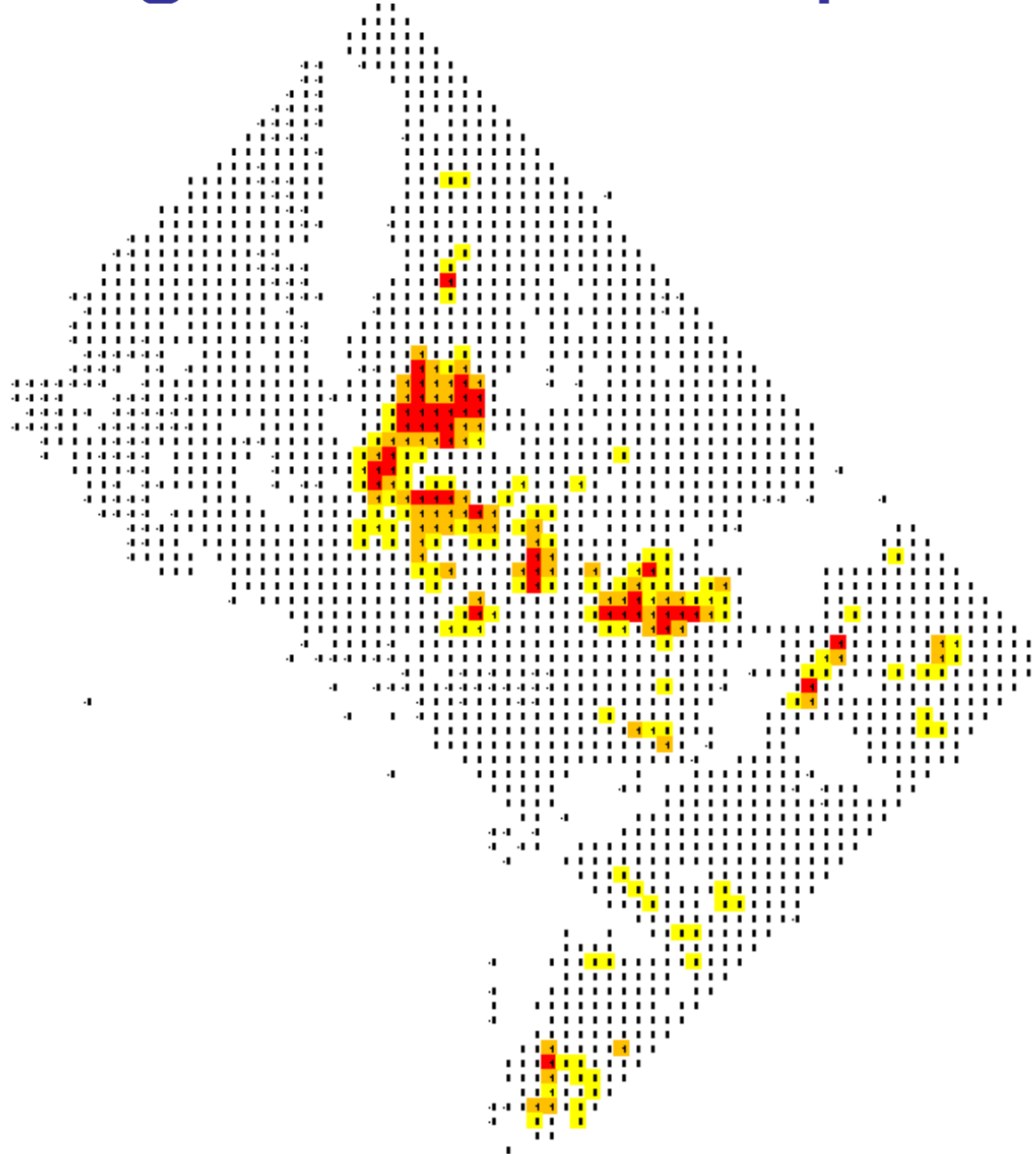
Interventions & assessment

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Predicting Robberies: Hot Spots or PP?
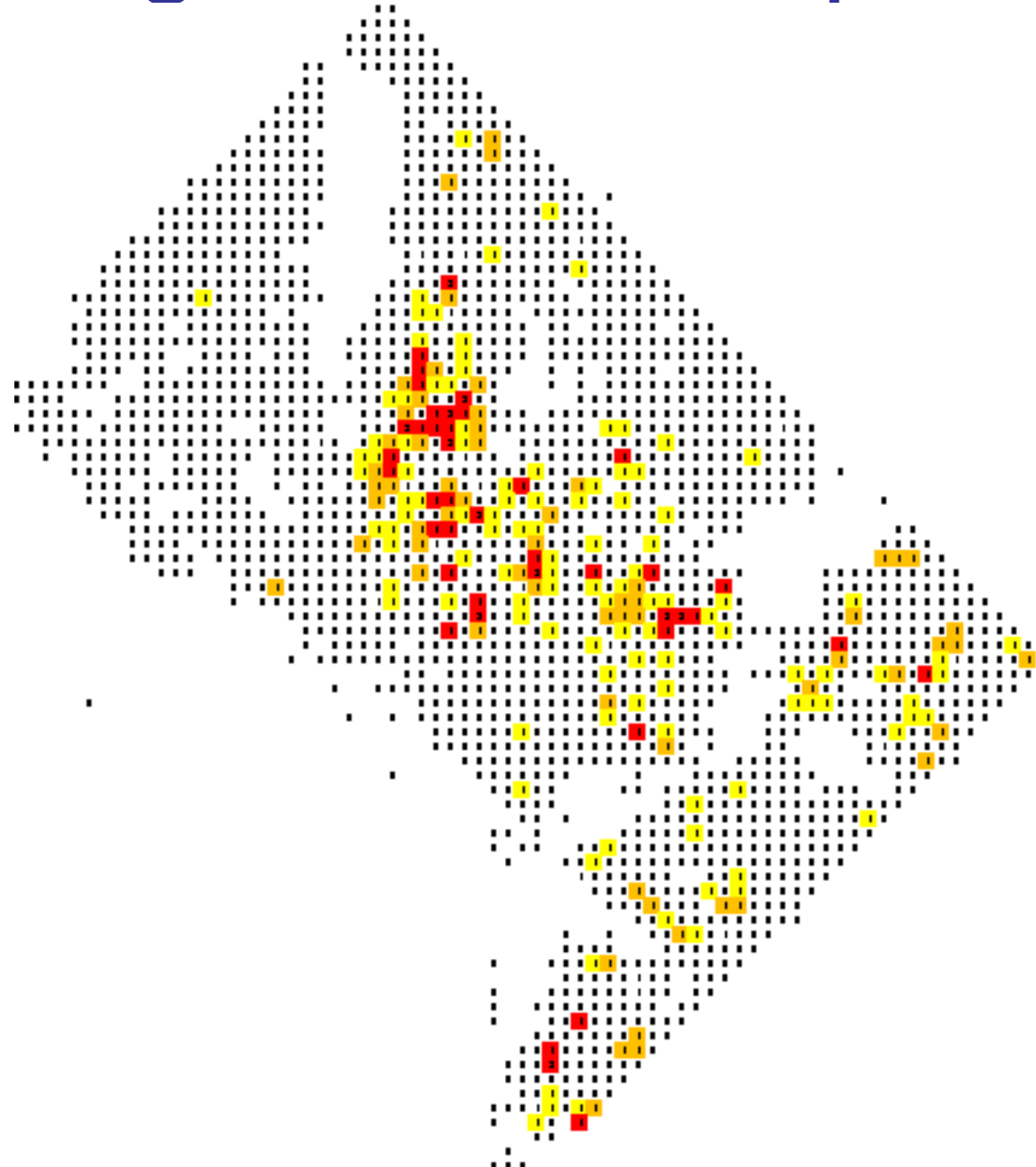
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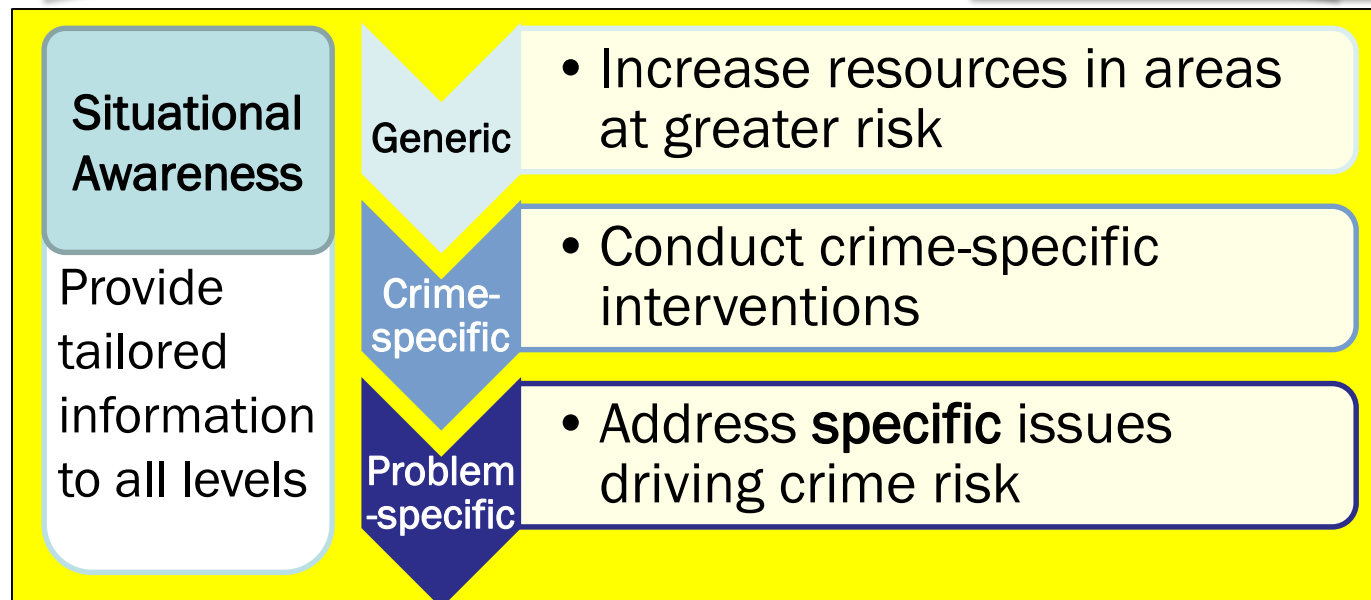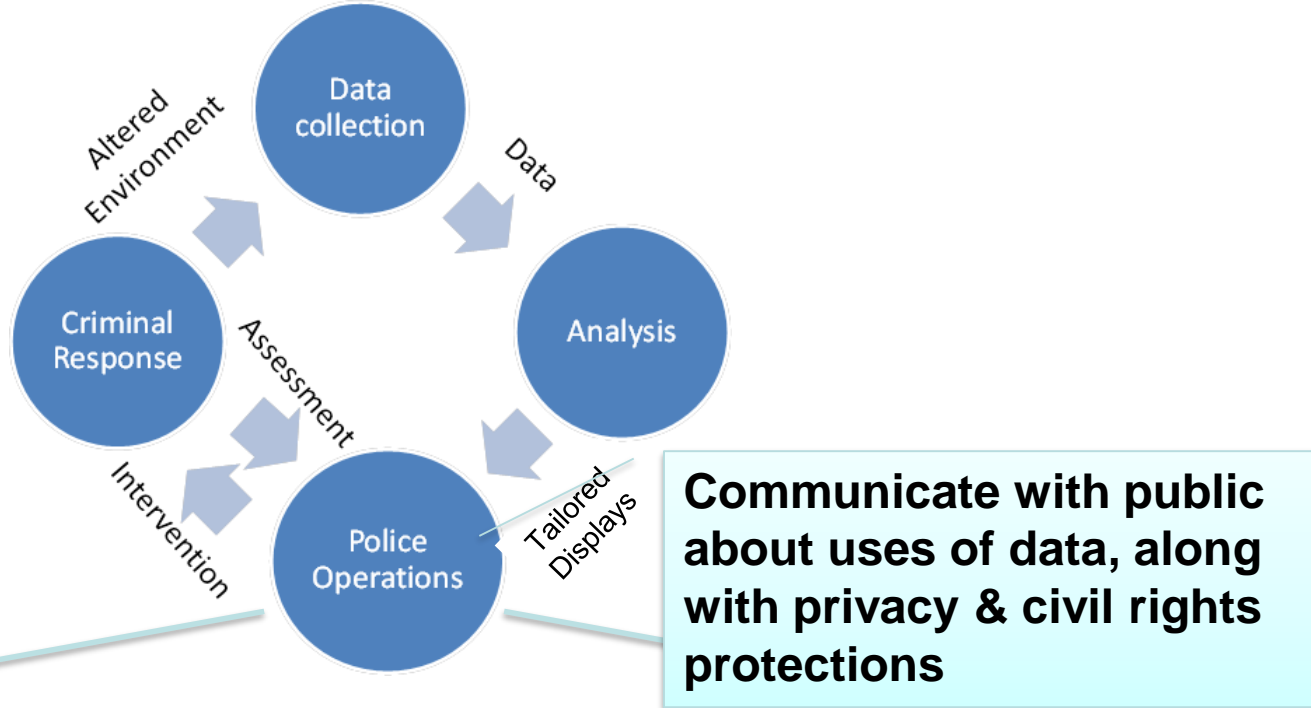

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The Future Will Not Look Like *Minority Report*

- *Unless the maps can start telling us where and when to go to pick up the criminals, we are just getting hot spots, and we've done hot spot policing for years*.

  - Paraphrase of a comment from the Shreveport Predictive Policing Experiment

  - This would require *several thousand-times increases* in predictive accuracy

- Instead, need to ask "**how do we identify and resolve problems driving crime risk?**"

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Using Data as a *Business Process*

Using Data as a Business Process (2)

Data collection

Analysis

Criminal Response

Police Operations

Altered Environment

Data

Assessment

Intervention

Tailored Displays

Communicate with public about uses of data, along with privacy & civil rights protections

Situational Awareness	Generic	• Increase resources in areas at greater risk
Provide tailored information to all levels	Crime-specific	• Conduct crime-specific interventions
	Problem-specific	• Address **specific** issues driving crime risk

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Also Generically Referred To As "Dashboards" in the Information Systems Business

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From Dashboards to Real-Time Operations and Decision Support Centers
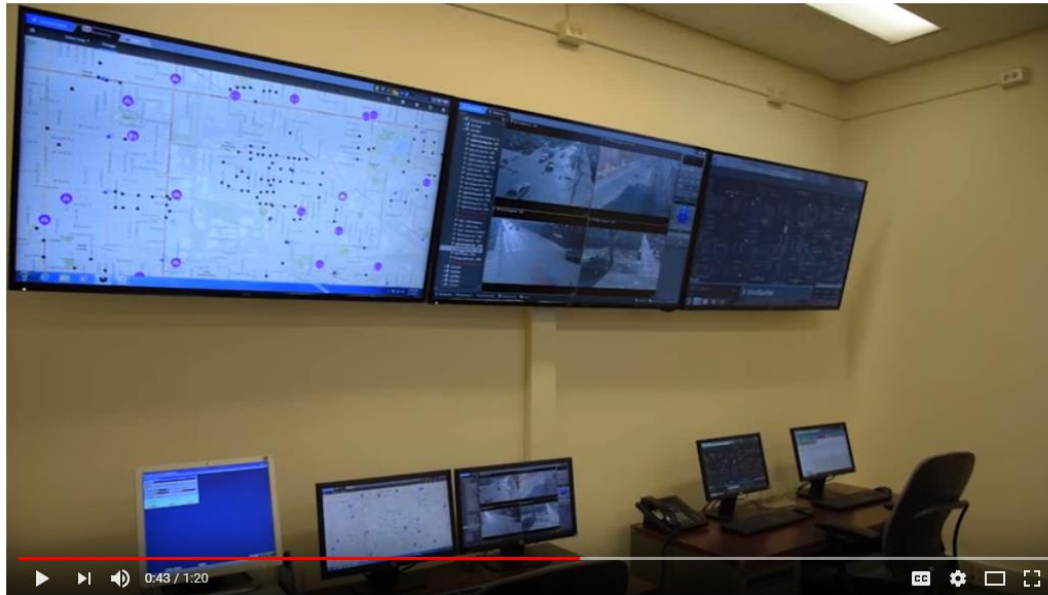
Chicago Police Department Highlights New Technology

https://www.youtube.com/watch?v=54-z8_s9Nbc
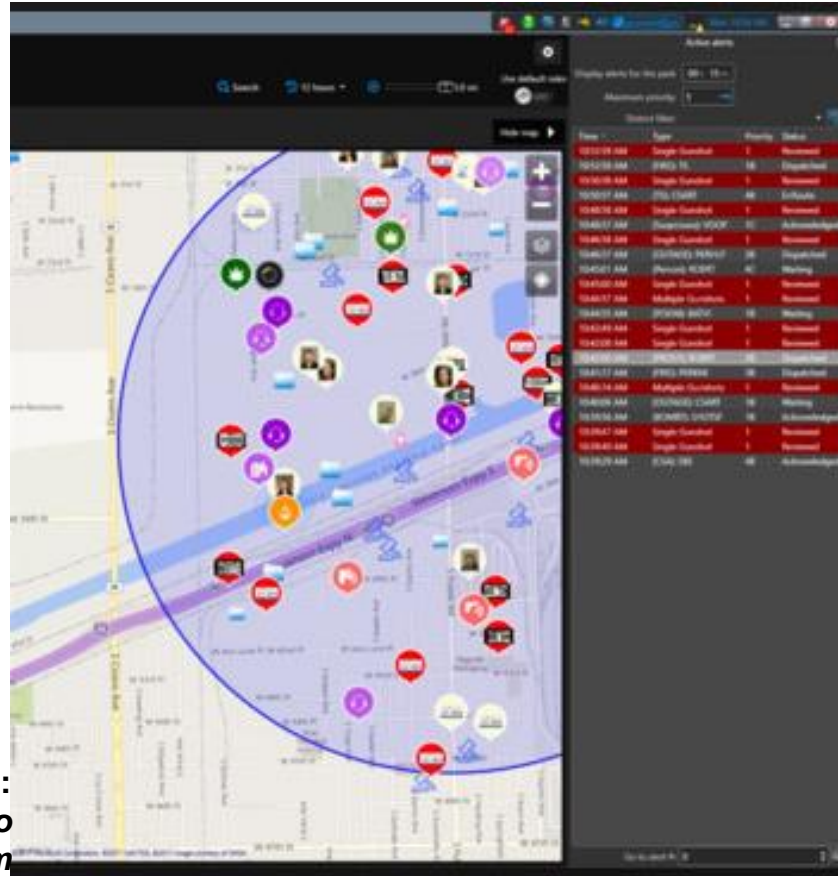
"... nerve centers that include predictive crime software..., additional cameras, gunshot detection systems, and mobile phones to officers in the field who receive real-time notifications and intelligence data at their fingertips"

SDSC Technologies

ShotSpotter Displays

Genetec Citigraf situational awareness maps and surveillance camera displays

Source:
SecurityInfo Watch.com

HunchLab Predictions

Also: access to datasets (CLEAR), including a network analysis tool and an app on events, persons, and warrants of interest

SDSCs Have Helped Enable Much More Rapid Decision Cycles...

COMPSTAT
Data on delays of a month or greater

Planning on a monthly or greater basis

Weekly
Meetings on topics like shootings

Assigns resources over next week

Daily
Meeting on events within the past day

Assigns resources over next day

Real Time
Monitoring of radio, cameras, & dashboard,

Assigns resources right now
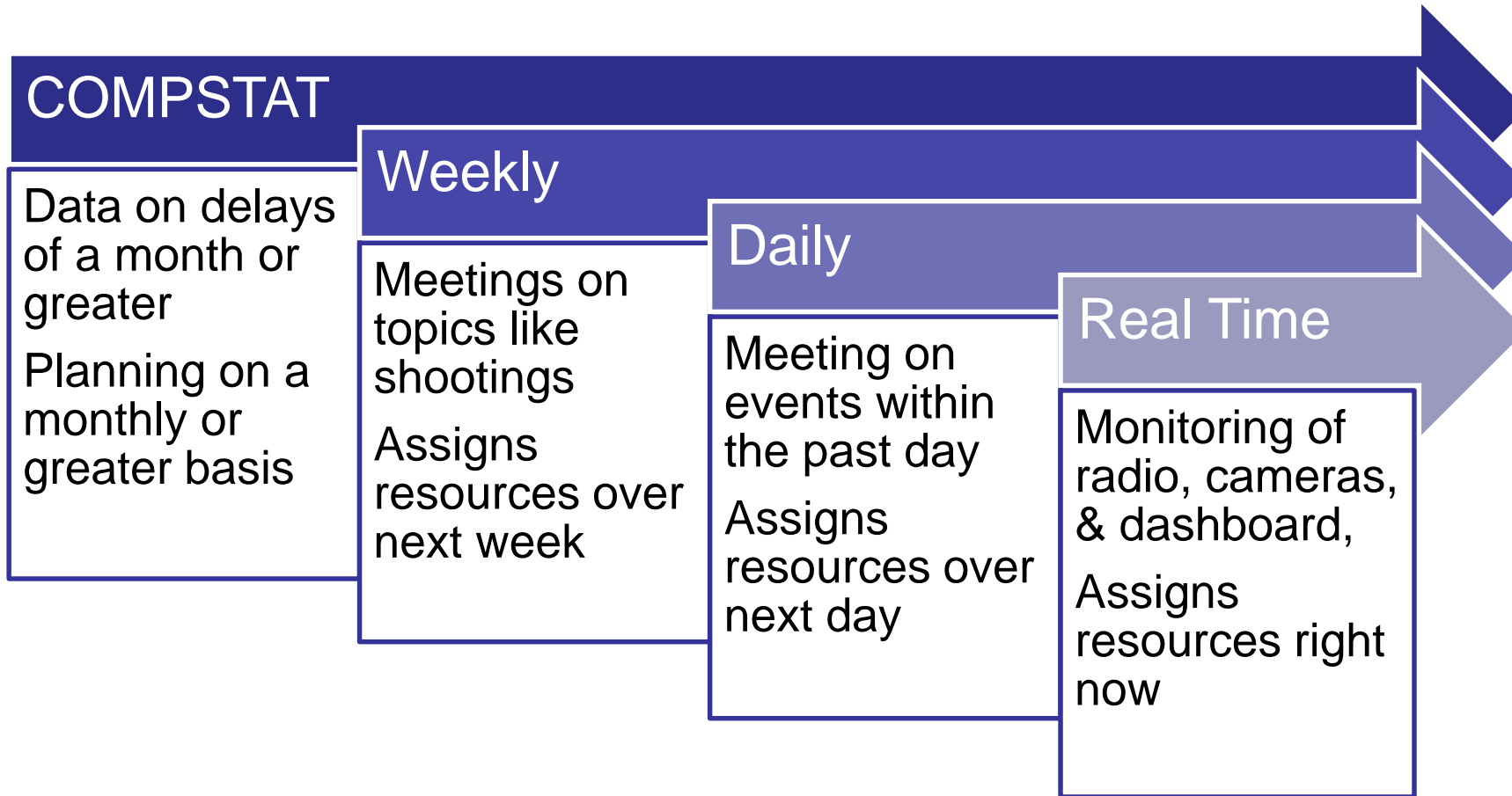
...Including Near Real-Time Monitoring, Response, and Other Ongoing Activities

24x7 monitoring

- Calls for service and radio traffic
- Live map of calls, units, and other data
- 4 surveillance camera feeds
- ShotSpotter

Immediate response

- Directing units
- Assisting units
- "Virtual chases" – tracking suspects across cameras
- Analytic support

Ongoing analyses & information sharing

- Preparing slides for briefings
- Crime analyses & investigations
- Ad-hoc meetings – "get info out of notebooks"

Examples of Issues & Responses at Daily Meetings

Issue	Response
Cars stolen after being left with ignition on to warm up	Distribute flyers to residents warning them about the risk
Shot Spotter hits (no victims found)	Send warning letters to owners
Patterns of crimes (recent spikes or computer predictions)	Concentrate resources in hot spots and times of the pattern
Open-air drug dealing at gas stations	Send resources to gas stations
Crimes on commercial properties	Send warning letters to owners and set up meetings
Shooting, with a risk of retaliation	Meet with those at risk

Top Policing Strategies to Enable, Based on Evidence

From the *Better Policing Toolkit*, an upcoming site providing tips and articles on strategies

Reduce crime in places: Problem-Oriented Policing

Reduce individuals' risk: Focused Deterrence

Improve community relations: Legitimacy Policing

Solve serious crimes: BJA's *Homicide Process Mapping* guidebook

Not recommended: Zero tolerance / aggressive policing

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The Future of Data Will Include Civil Rights and Privacy Disputes

- "We regard as inevitable, particularly with the technology's widespread adoption and attendant increased publicity, Fourth Amendment–based lawsuits challenging its use."

  – From *License Plate Readers for Law Enforcement*

  – But widely applicable… and focusing on **uses** can help

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Bottom Line on Privacy Policies

Don'ts

- Allow just about anyone to access the data
- Keep as much data as possible forever
- Allow just about any data use
- Not sure about what will be done with data, other than catch bad guys – maybe
- Don't talk to anyone about what you're doing

Do's

- Access policies / authentication measures
- Restrictions on collection and retention
- Auditing of collection and use
- Defined use cases, e.g.—
  - Search for social media threats at major public events
- Talk with community and experts about what you're doing in advance

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Bottom Line on Privacy Policies

Need a user / activity focus – in other words, a focus on what you will do with the data – to do these properly

Don'ts

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What We Would Like to See With IT Investments

Department Investments	→	Department Activities	→	Outputs	→	Outcomes
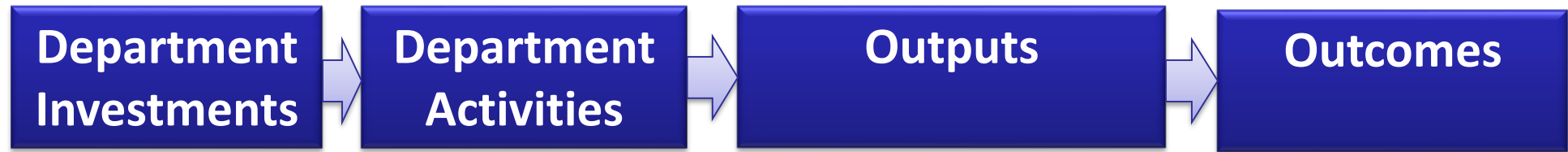
Should be a clear storyline (*logic model*) linking investments to activities, to outputs, to improvements in outcomes (i.e., performance metrics)

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What We Would Like to See With IT Investments

Department Investments	Department Activities	Outputs	Outcomes
• Personnel • Training/Ed. • **IT** • Planning • Facilities • Equipment	• Proactive • Reactive • Support	• Proactive activities • Cases cleared • Community collaborations • Capabilities developed • Data shared & used	• Less crime & fear of crime • Offenders held accountable • Improved legitimacy • Greater capabilities

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Department Inputs	Department Activities	Outputs	Outcomes

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What We Would Like to See With IT Investments

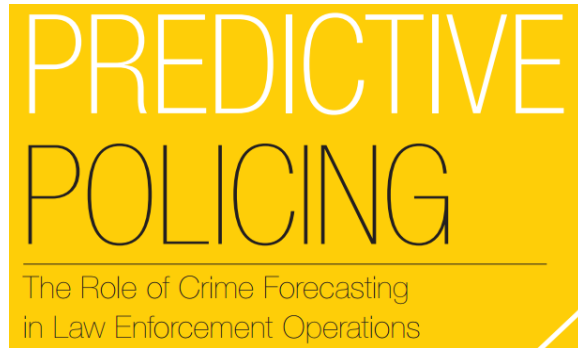| Department Inputs	Department Activities	Outputs	Outcomes
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IT in support of: **to improve quality of life by protecting life and property; detecting, solving, and reducing crime; reducing fear of crime; and enhancing security and safety in cooperation with citizens and the community**

o *Created from analyzing ten agencies' mission statements*

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Questions? (johnsh@rand.org)

www.rand.org

Search: RR-233

PREDICTIVE POLICING
The Role of Crime Forecasting in Law Enforcement Operations

Search: RR-467

License Plate Readers for Law Enforcement

Opportunities and Obstacles

Keith Gierlack, Shara Williams, Tom LaTourrette,
James M. Anderson, Lauren A. Mayer, Johanna Zmud

Search: RR-569

Police Department Investments in Information Technology Systems

Challenges Assessing Their Payoff

Brian A. Jackson, Victoria A. Greenfield, Andrew R. Morral, and John S. Hollywood

Improving Information-Sharing Across Law Enforcement: Why Can't We Know?

John S. Hollywood, Zev Winkelman

Search: RR-645

Using Future Internet Technologies to Strengthen Criminal Justice

John S. Hollywood, Dulani Woods, Richard Silberglitt, Brian A. Jackson

Search: RR-928

Using Social Media and Social Network Analysis in Law Enforcement

Creating a Research Agenda, Including Business Cases, Protections, and Technology Needs

John S. Hollywood, Michael J. D. Vermeer, Dulani Woods, Sean E. Goodison, Brian A. Jackson

Search: RR-2301

Report on video analytics & sensor fusion forthcoming

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