Philadelphia Smart Policing

A Head to Head Test of Three Policing Strategies

October 16, 2012

Smart policing practices

"Our strategies, tactics and allocation of resources will be guided by information, intelligence, and nationally recognized best police practices. We will use accurate, current statistical data, along with human intelligence. We will develop innovative strategies to combat crime and disorder."
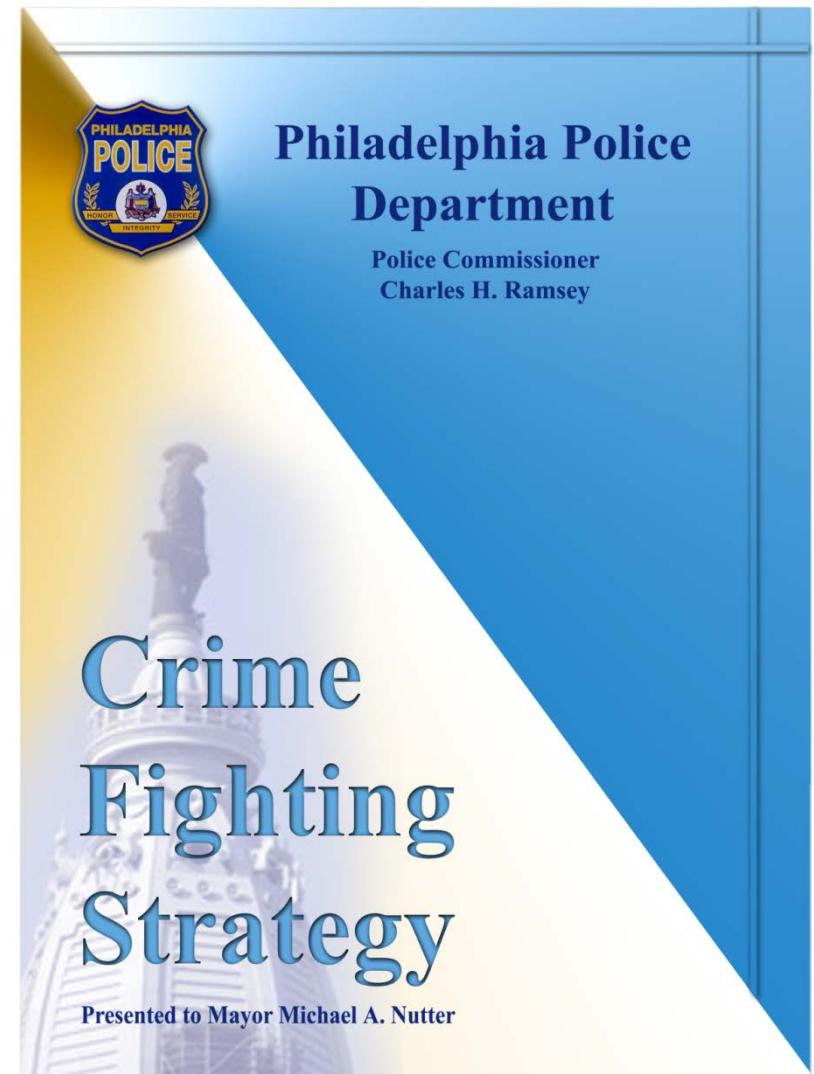
So what works?

- Policing small, high crime "hot spots" is an effective crime reduction strategy (Braga et al., 2012)

- Strategies tested on violent crime:

  - Directed patrol (Sherman and Weisburd, 1995)

  - Foot patrol (Ratcliffe et al., 2011)

  - Fixed presence (Lawton et al., 2005)

  - Problem-solving (Braga et al., 1999)

  - Crackdowns (Sherman and Rogan, 1995)

- But what strategies are <u>most</u> effective for the <u>PPD</u>?

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The problem: what works best for the PPD?

- Heterogeneity in application, dosage, sites and results across evaluations

- Need a head-to-head test of strategies within the context of Philadelphia and within current operations

Philadelphia Smart Policing Experiment

- A randomized-controlled trial testing the effectiveness of three policing tactics

  - Foot Patrol
  - Problem Solving
  - Offender Focus

- Designed to simulate how strategies would be carried out under normal procedures while minimizing researcher involvement

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Lessons learned from the foot patrol experiment

- Commanders wanted more flexibility

- Foot patrol officers wanted more flexibility

- As designed, some beats not amenable to foot patrols

- Some beats considered too small

- Not enough organizational knowledge incorporated in planning and implementing the experiment

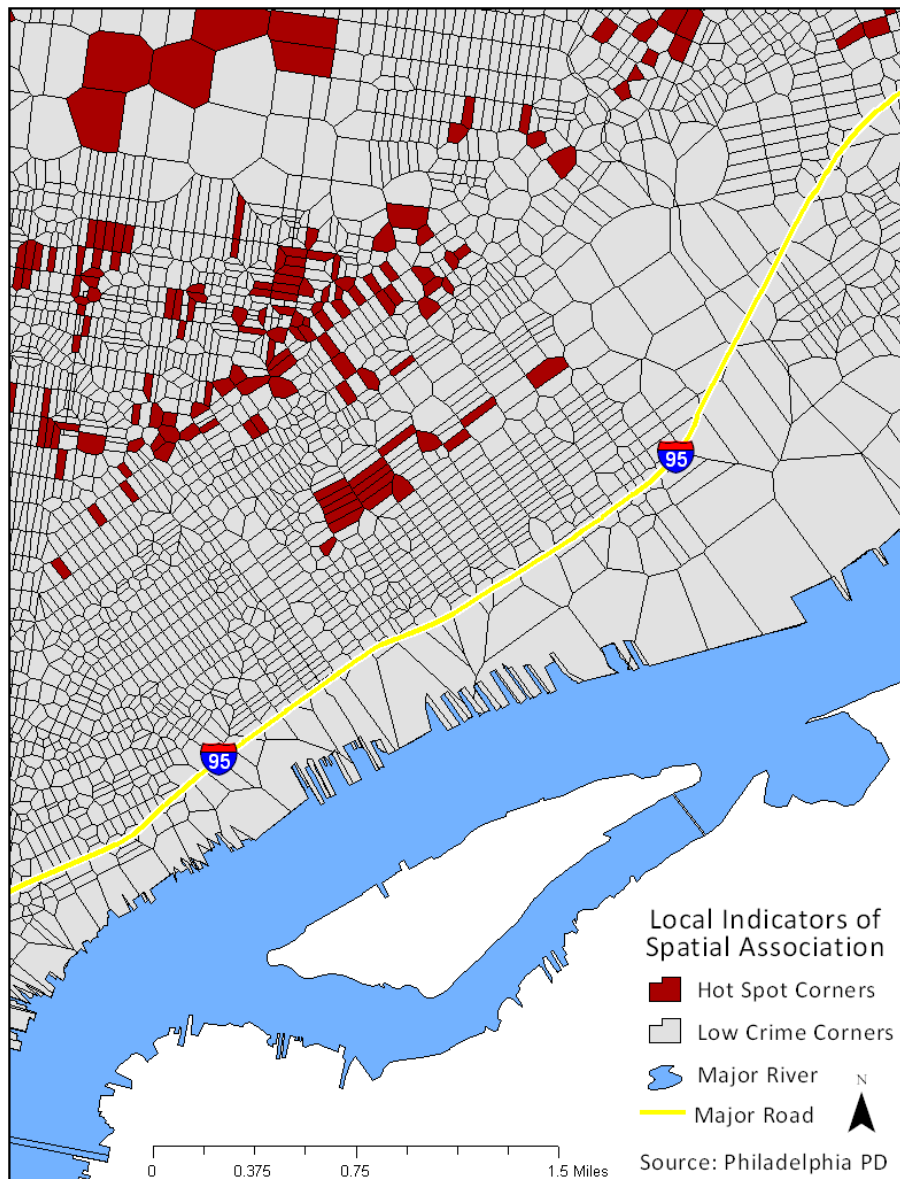# Methodological approach: the planning phase

- Temple Team involved in organizing the experimental design, identifying the hot spot locations and analyzing the results

- Philadelphia Leadership and district commanders involved in assigning areas a treatment and implementing the responses

Methodological approach: identifying hot spots

- Hot spots identified using LISA and HNN analyses
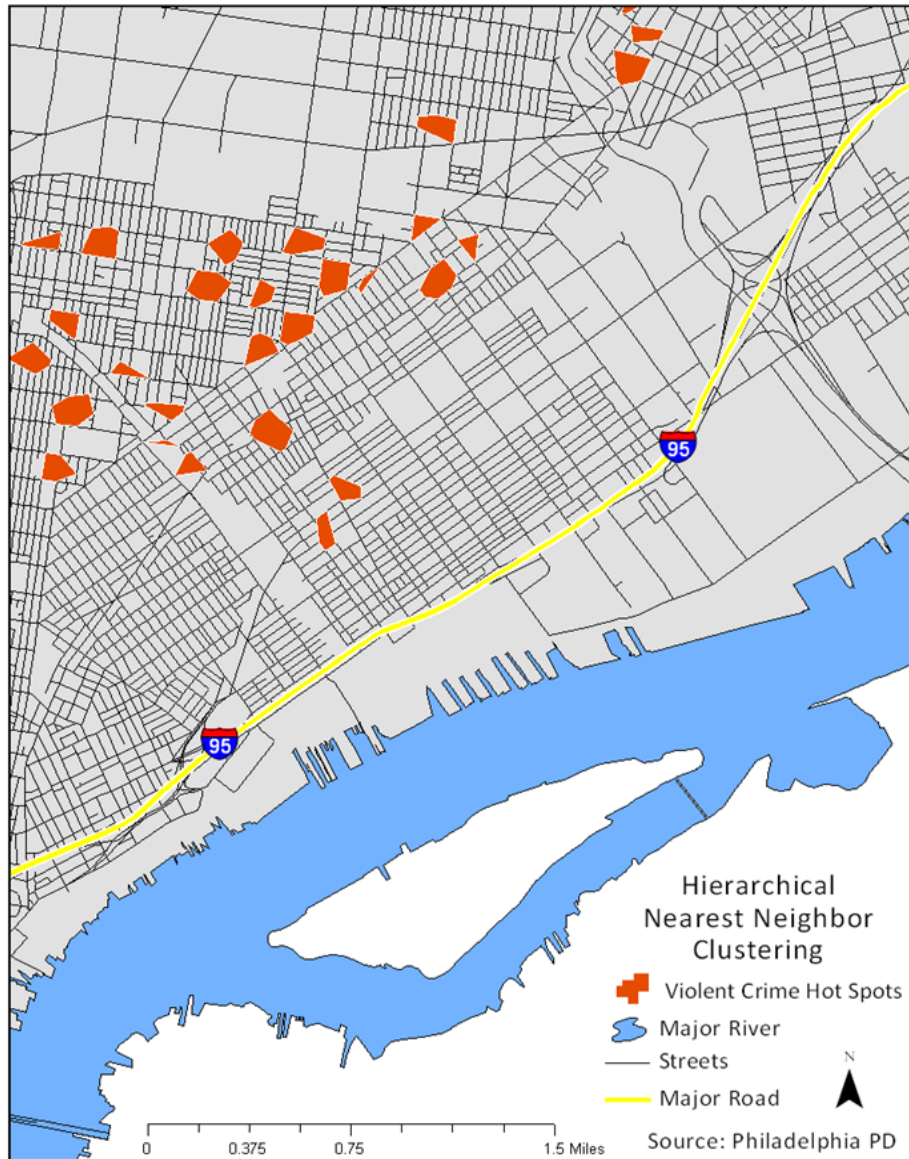
  - Local Indicator of Spatial Association (LISA)

    - Thiessen polygon network drawn around street intersections
    - Crime points overlaid and aggregated to Thiessen polygons

  - Hierarchical Nearest Neighbor Clustering (HNN)
    - Not restricted by underlying geography (Thiessen polygons)
    - Shape of hot spot follows the actual shape of the point data (crime points)

LISA analysis

Local Indicators of
Spatial Association

- Hot Spot Corners
- Low Crime Corners
- Major River
- Major Road

N

0   0.375   0.75   1.5 Miles

Source: Philadelphia PD

- Weighted Crime Categories to reflect the focus on violence reduction
  - Homicide, armed robbery and aggravated assault = 2
  - Unarmed robbery and simple assault = 1

- Local Moran's I identified 818 high crime street corners surrounded by at least 1 other high crime street corner

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HNN analysis

Hierarchical Nearest Neighbor Clustering

- Violent Crime Hot Spots
- Major River
- Streets
- Major Road

0   0.375   0.75   1.5 Miles

N

Source: Philadelphia PD

- To reflect focus on violence, only homicide, armed robbery and aggravated assault data were used for the HNN analysis

- 167 first order hot spot clusters were identified (minimum events were set at 10 and delineated as convex hulls)

- First order clusters are crime points that have distances from one another that are shorter than would be expected under the assumption of spatial randomness

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Delineating target areas

- District Captains and executive leaders used operational knowledge to identify 27 areas for each treatment type

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Randomization

- After police leaders delineated beats and assigned a treatment, beats were stratified into 3 groups of 27

- Random assignment achieved using a random number generator on each stratum of 27 areas

- Each foot patrol, problem solving and offender focus stratum had 20 target areas and 7 control areas assigned.

Philadelphia SPI Deployment Areas

City of Philadelphia
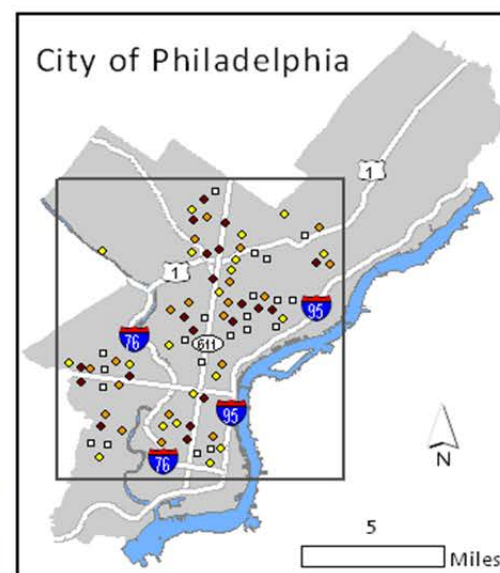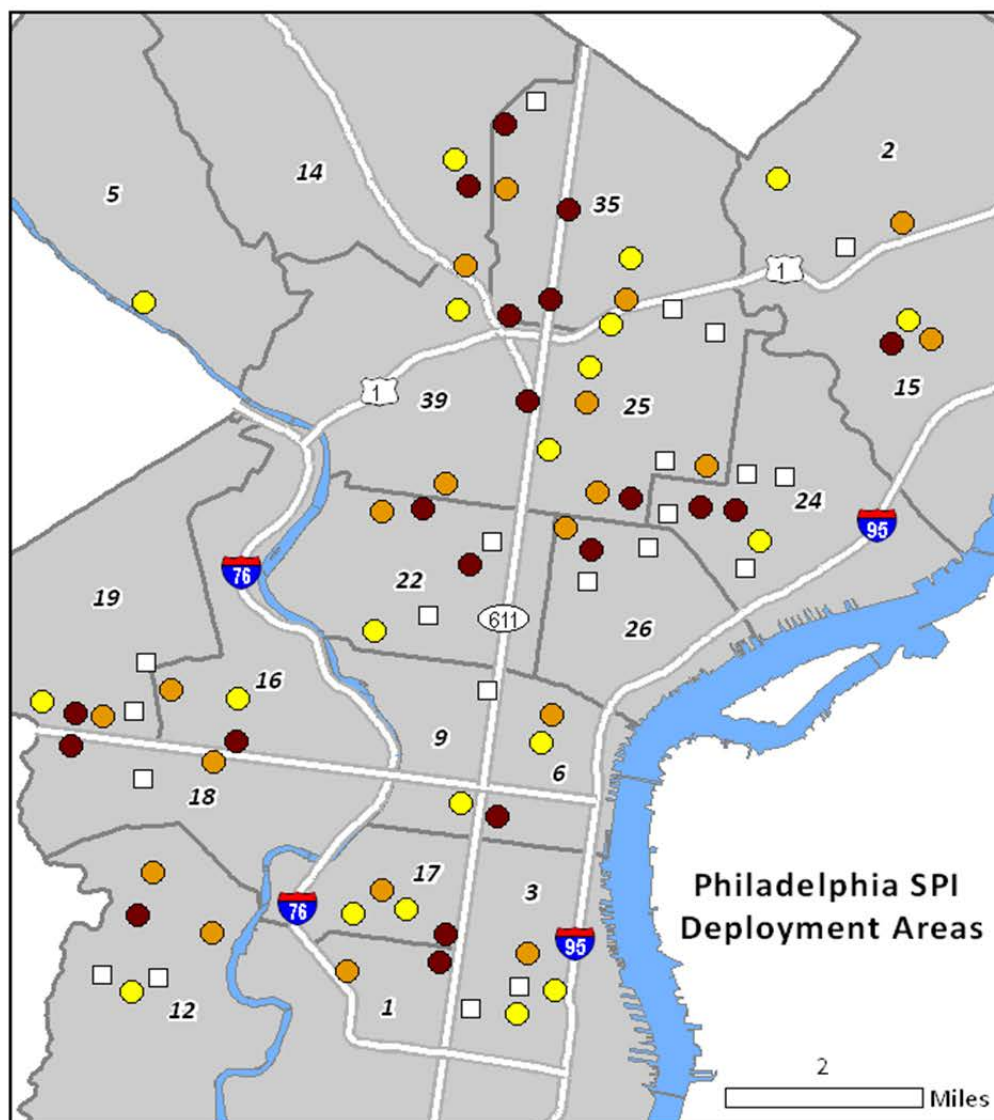
Deployment Areas
- ☐ Control
- 🟡 Problem solving
- 🟠 Offender focus
- 🔴 Foot patrol

Geography
- Police Districts
- Major Roads
- Major Rivers

Source: Philadelphia Police Department

Treatment: foot patrol

- Foot Patrol

    - Each Captain given discretion in how to deploy foot officers

    - Required to staff areas for at least 8 hours per day / 5 days per week

   - The foot patrols were implemented for 12 weeks

Treatment: problem solving

- Followed the tenets of problem-oriented policing and a modified SARA process

- Teams of district officers carried out process in conjunction with support personnel from headquarters trained in the problem solving process (PPD 2020)

- District teams also attended a 1 day problem solving workshop to introduce them to POP and SARA

- Treatment time varied across sites

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Treatment: offender focus

- Framed by tenets of intelligence-led policing

- Members were drawn from officers assigned to tactical operations, and partnered with the PPD central intelligence unit to maintain a list of prolific offenders

- Tasked with monitoring/interacting with repeat offenders either living in or operating in the hot spot (i.e. making small talk, serving warrants or performing legal field investigations)

- Treatment time varied across sites

Experimental analysis

Foot Patrol

Offender focus

Problem Solving

July 2010 — Sept 10 — Nov 10 — Jan 2011 — End Feb 11
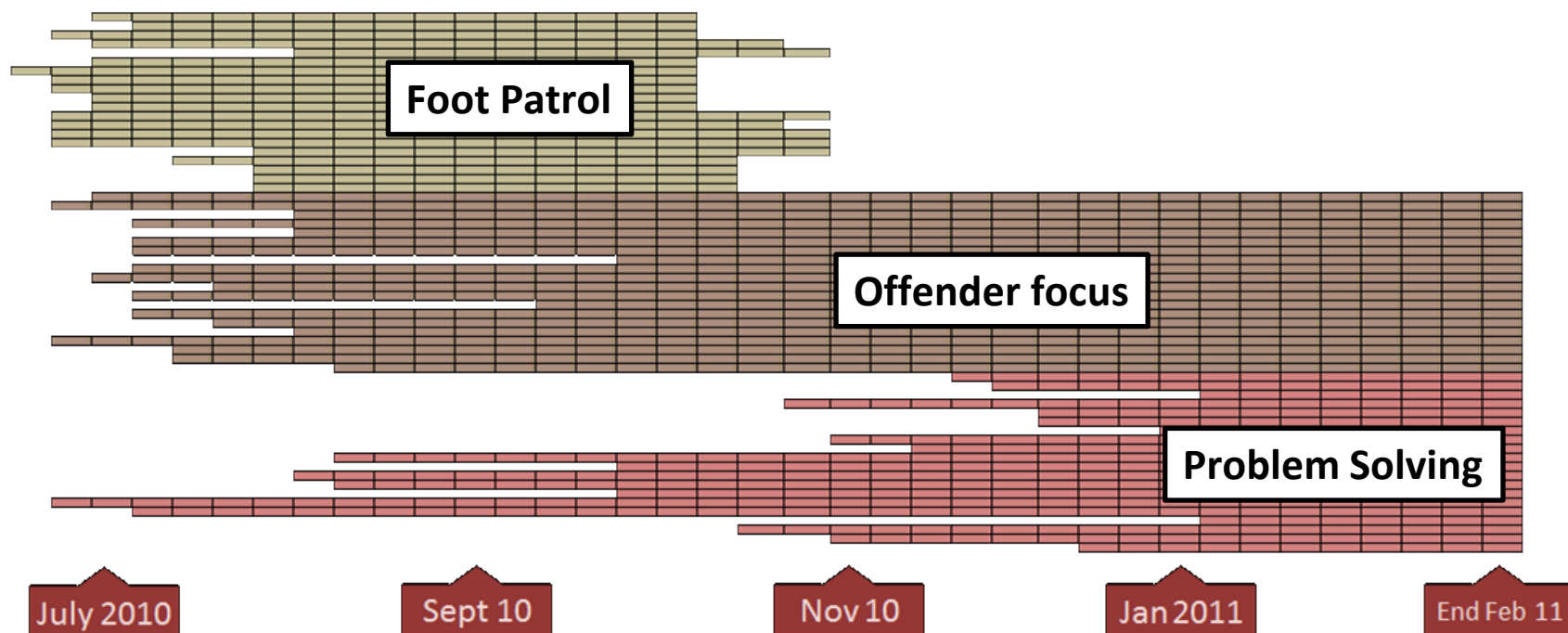
Experimental analysis

- Repeated measure multi-level modeling with contrast coding

    - Necessary since sites were operating at different times

    - Capable of examining changes over time

    - Flexible enough to test comparisons across multiple groups

    - Can compare multiple groups over time by creating variables for each treatment and control group that simply "turn on" during the time periods they were active

Experimental analysis

- Dependent variables: violent crime and violent felony crime counts aggregated to 2 week time blocks

- Level 1 independent variables:
  - Linear time (0-36)
  - Quadratic time (0-1296)
  - Temperature (average of 2 week time block)
  - Foot patrol (active = +.5; inactive = 0; control = -.5)
  - problem solving (active = +.5; inactive = 0; control = -.5)
  - offender focus (active = +.5; inactive = 0; control = -.5)

Results

|	All Violence	Violent Felonies
	1.004	1.012
	1.000	1.000
		1.291
		1.109

Poisson distributions with over dispersion and an exposure variable of area
*p < .025, Bonferroni corrected p-value based on two outcomes

Goals

- ✓ Reduce violent street crime in Philadelphia.

- ✓ Conduct a head-to-head test of three different evidence-based approaches to reducing violent crime.

- ✓ Expand the Philadelphia Police Department's capacity to use and implement data-driven, evidence-based approaches to reducing violent street crime.

Project Management and Implementation
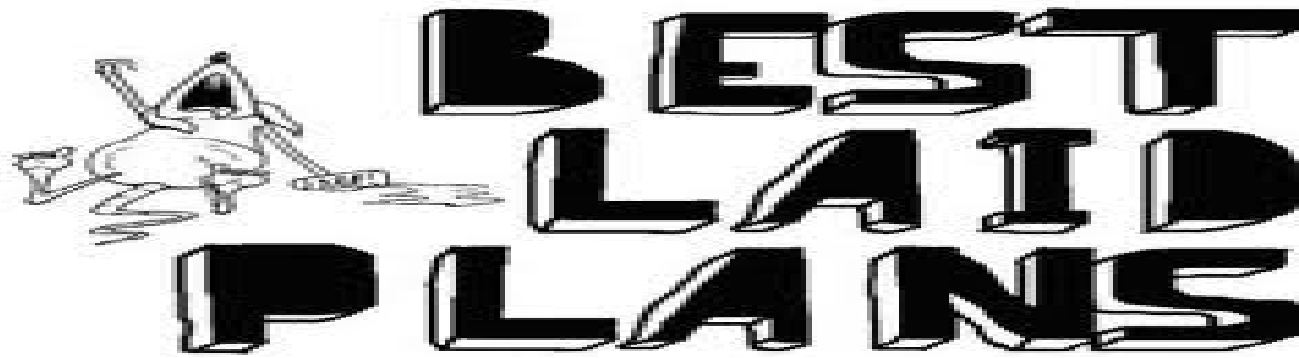
- Challenge of testing three approaches – large scope.

- Underestimating the time needed to get our people ready to do the work.

- Need for a full-time project manager.

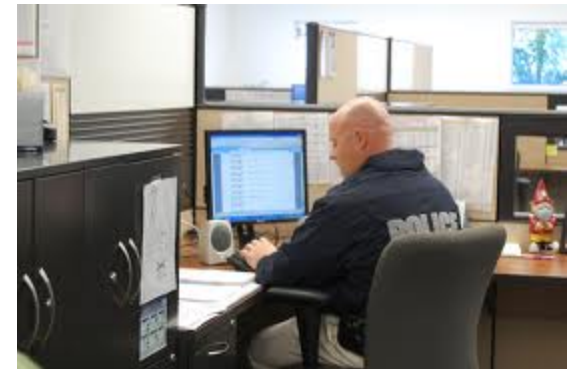- Plan for the hiring and procurement process – a long time.

Lessons Taught

Mark Twain's Quotes by mauwolff

The man who carries a cat by the tail learns something that can be learned in no other way.
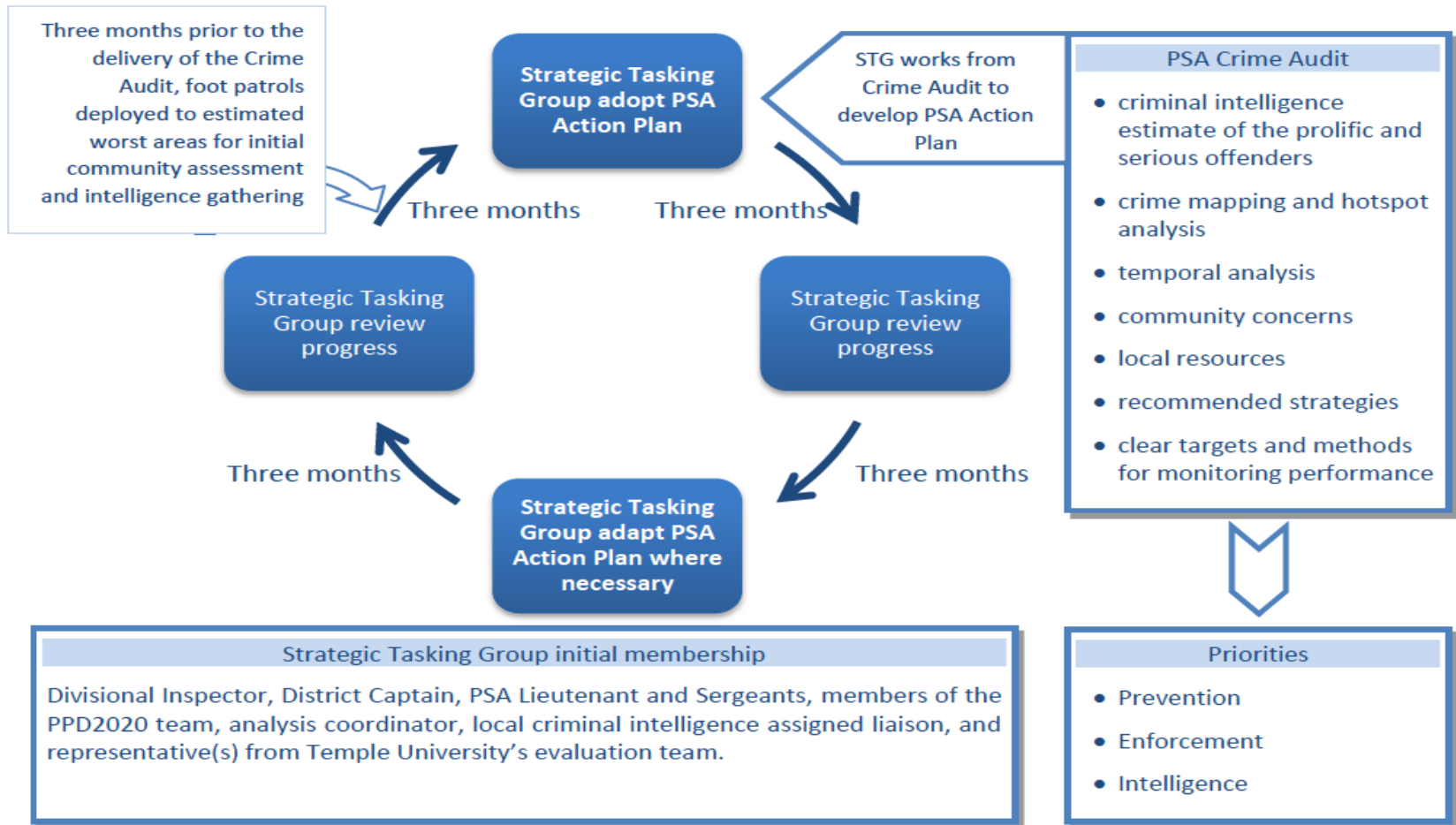
Mark Twain
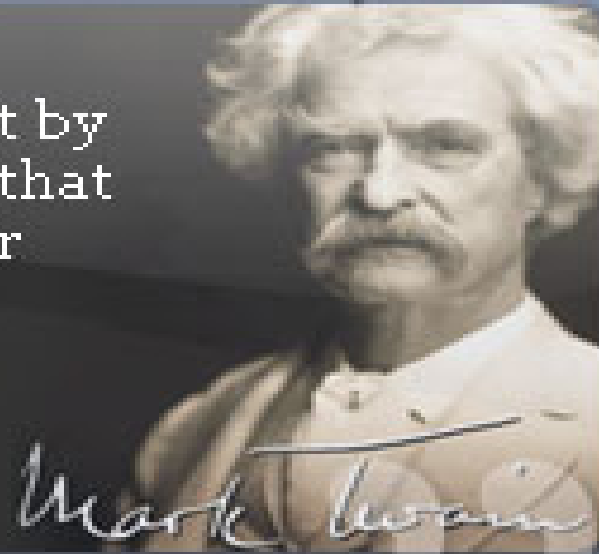
Embedding data, evidence, and research into daily operations
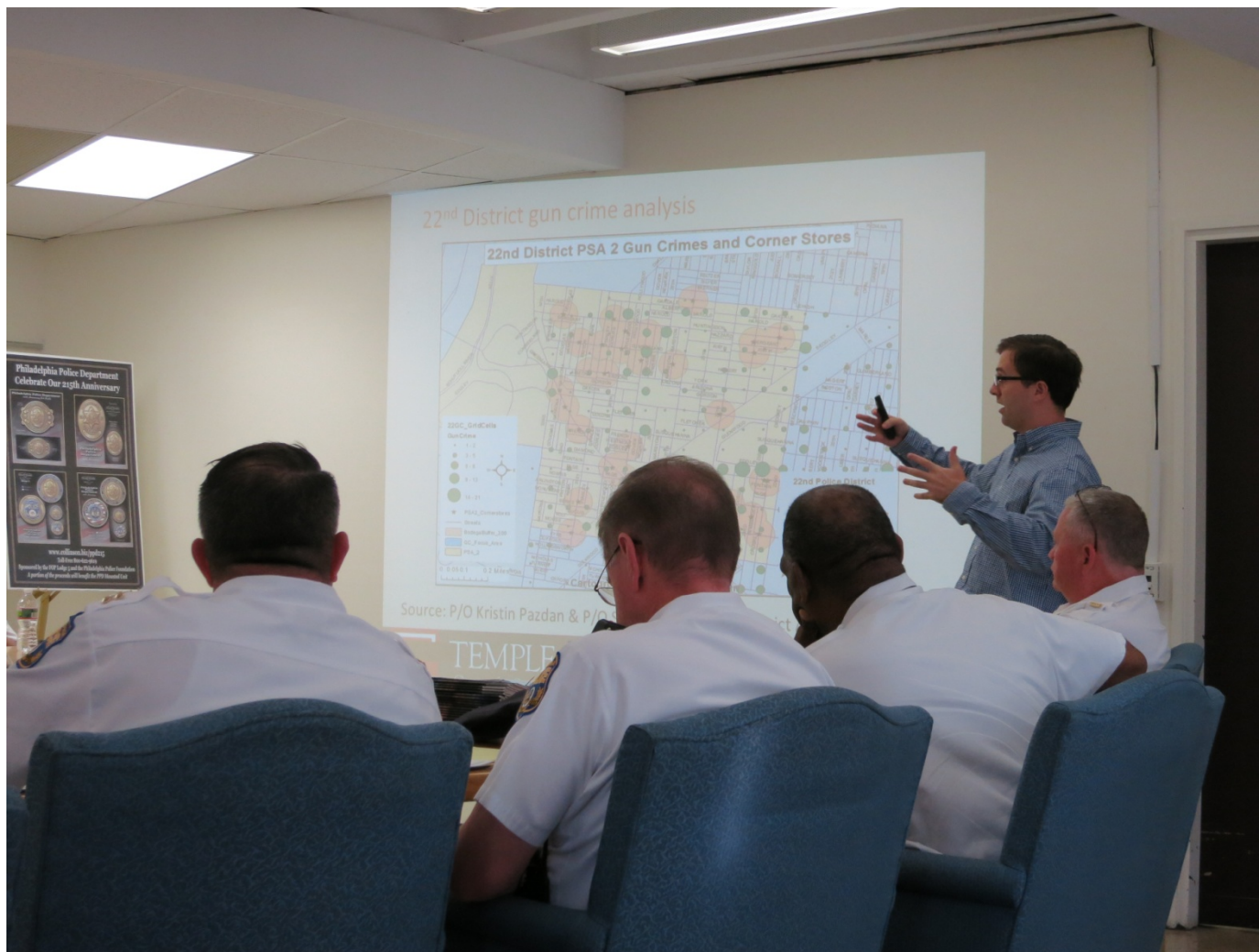
Changing the DNA of a Police Organization

SMART II: The Philadelphia PSA Crime Audit and Plan Process

Three months prior to the delivery of the Crime Audit, foot patrols deployed to estimated worst areas for initial community assessment and intelligence gathering

Strategic Tasking Group adopt PSA Action Plan

STG works from Crime Audit to develop PSA Action Plan

Strategic Tasking Group review progress

Strategic Tasking Group review progress

Strategic Tasking Group adapt PSA Action Plan where necessary

Three months

Three months

Three months

Three months

PSA Crime Audit

- criminal intelligence estimate of the prolific and serious offenders
- crime mapping and hotspot analysis
- temporal analysis
- community concerns
- local resources
- recommended strategies
- clear targets and methods for monitoring performance

Strategic Tasking Group initial membership

Divisional Inspector, District Captain, PSA Lieutenant and Sergeants, members of the PPD2020 team, analysis coordinator, local criminal intelligence assigned liaison, and representative(s) from Temple University's evaluation team.

Priorities

- Prevention
- Enforcement
- Intelligence

Training Analysts

Educating Command Staff

Levels of Problems

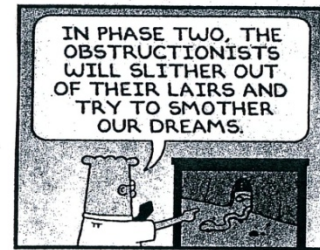| Level	Example	Responsibility/Authority
Immediate problem	Calls for Service Single Crime Disorder Compliant	Officer/Sergeant
Short-term problem	Repeat Incidents or Calls for Service Crime Pattern	Sergeant/Lieutenant
Long-term problem	Chronic Crime or Disorder Problem Locations Offenders Victims Property	Lieutenant/Captain
Problem across divisional boundaries or requires resources beyond the district	Same as above	Captains/Inspector

Adapted from "Police agency accountability, actionable crime analysis, and crime reduction" by Dr. Laura Wyckoff at the Law Enforcement Forecasting Group Session, September 18, 2012.

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The Relationship Between Ranks, Influence, and Complexity
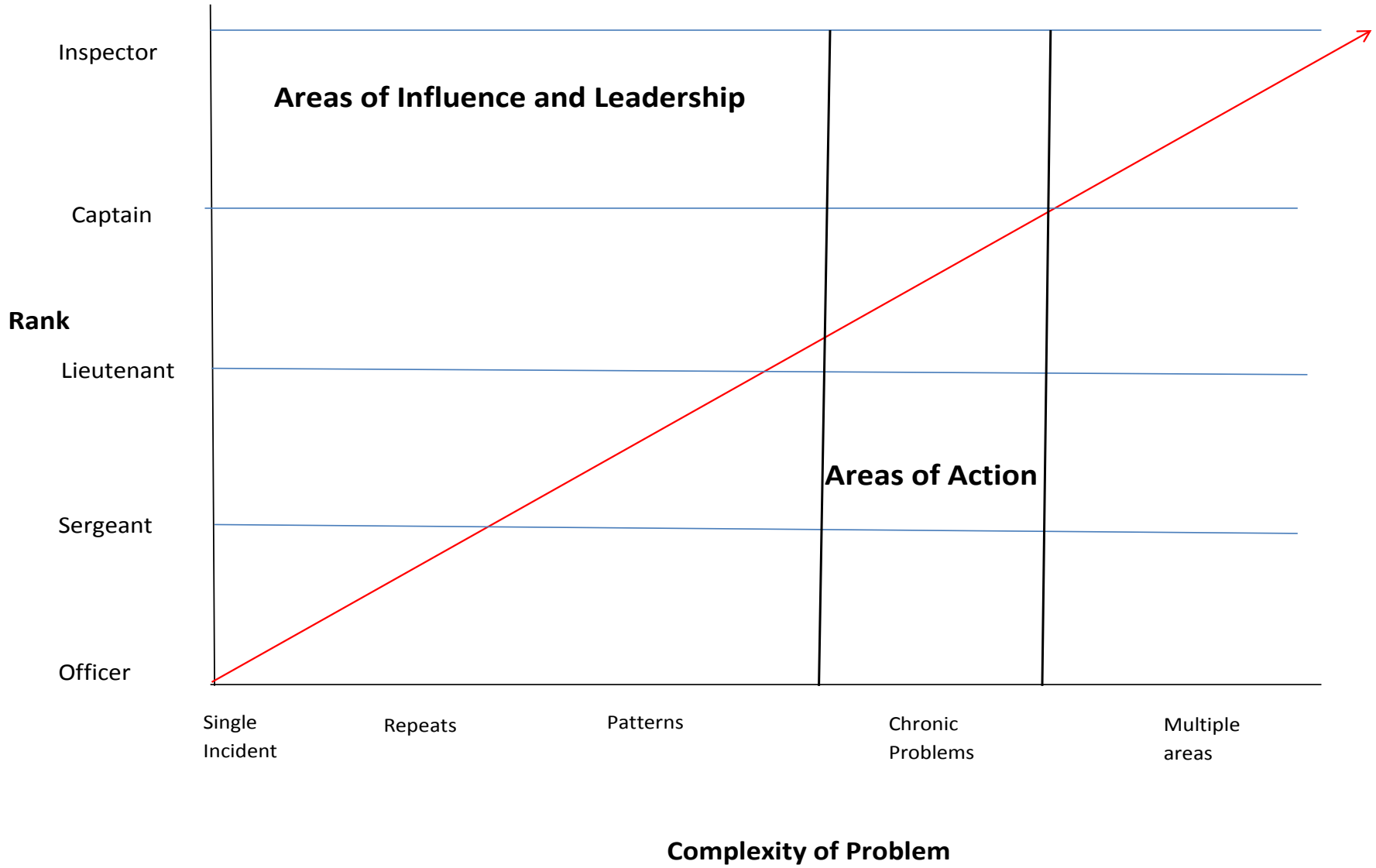
Reality Check by Dilbert