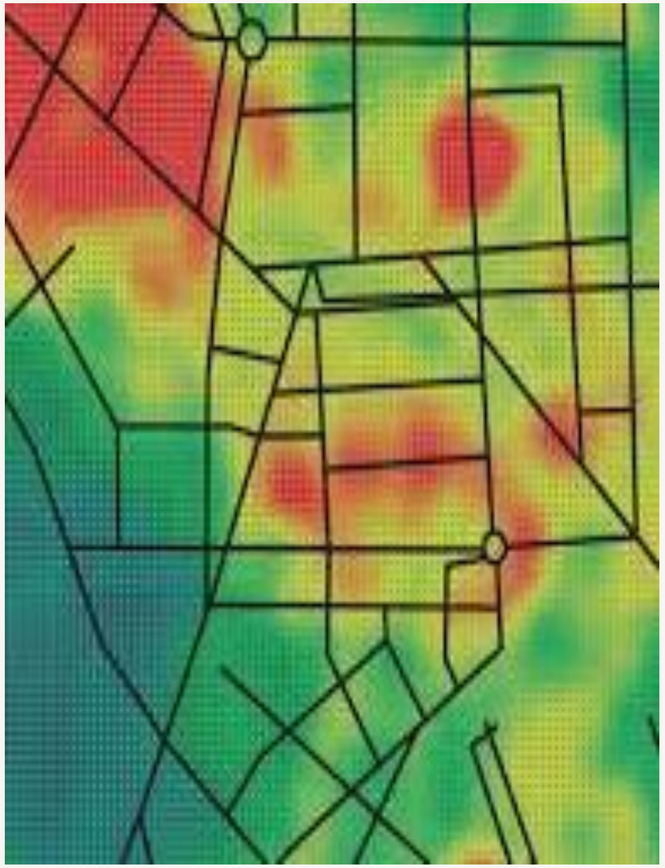
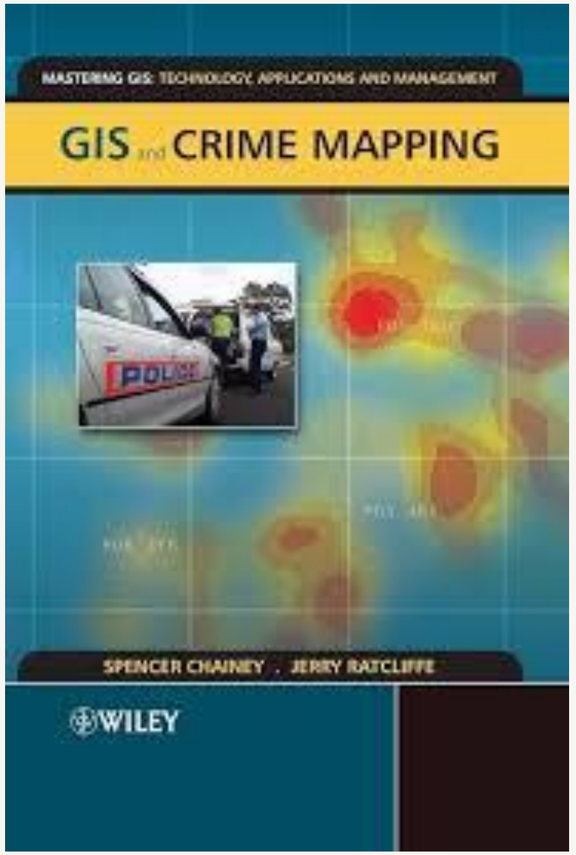
Place-Based Predictive Policing: A Primer

Professor Andrew Guthrie Ferguson

Place & Crime: Theory of Environmental Risk



- Crime is not equally distributed across society.
- Hot spots of crime can be identified.
- Patterns of heightened risk for some crimes (burglary, theft) can be identified.
- Environmental factors shape criminal activities.
- Environmental risks predict criminal risks.



Place & Crime: Predictive Policing as Management

Police Department
City of New York

CompStat

Report Covering the Week 3/23/2015 Through 3/29/2015

Crime Complaints

			28 Day			Year to Date*		
4	8	-50.0	22	22	0.0	79	87	
31	23	34.8	104	91	14.3	308	285	
168	323	-18.0	1,042	1,109	-6.0	3,340	3,868	
297	396	-25.0	1,315	1,467	-10.4	3,926	4,486	
225	282	-20.2	929	1,160	-19.9	3,144	3,968	
765	773	-1.0	2,861	3,163	-9.5	9,006	9,715	
114	110	3.6	472	485	-2.7	1,467	1,552	
1,591	1,915	-11.17	6,745	7,497	-10.01	21,466	23,881	-10

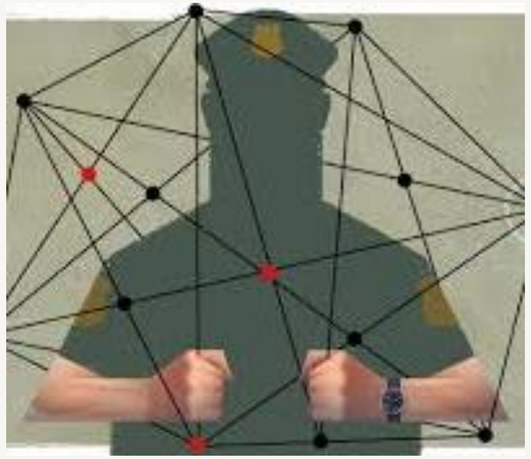
NYPD

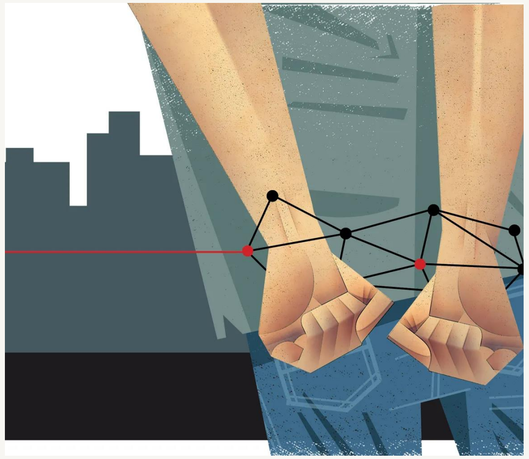
LAPD

Why adoption? (2013 budget cuts/ sequestration/ 2014 post-Michael Brown protests).

Budget cuts, political pressure, technological relevance, “innovation” have all pushed technology into policing.

Lure of “objectivity,” “efficiency,” “data.”





Early Place-Based Predictive Policing

Theory

- Use Past Crime Data
- Identify Precise Locations of Heightened Risk

Remedy

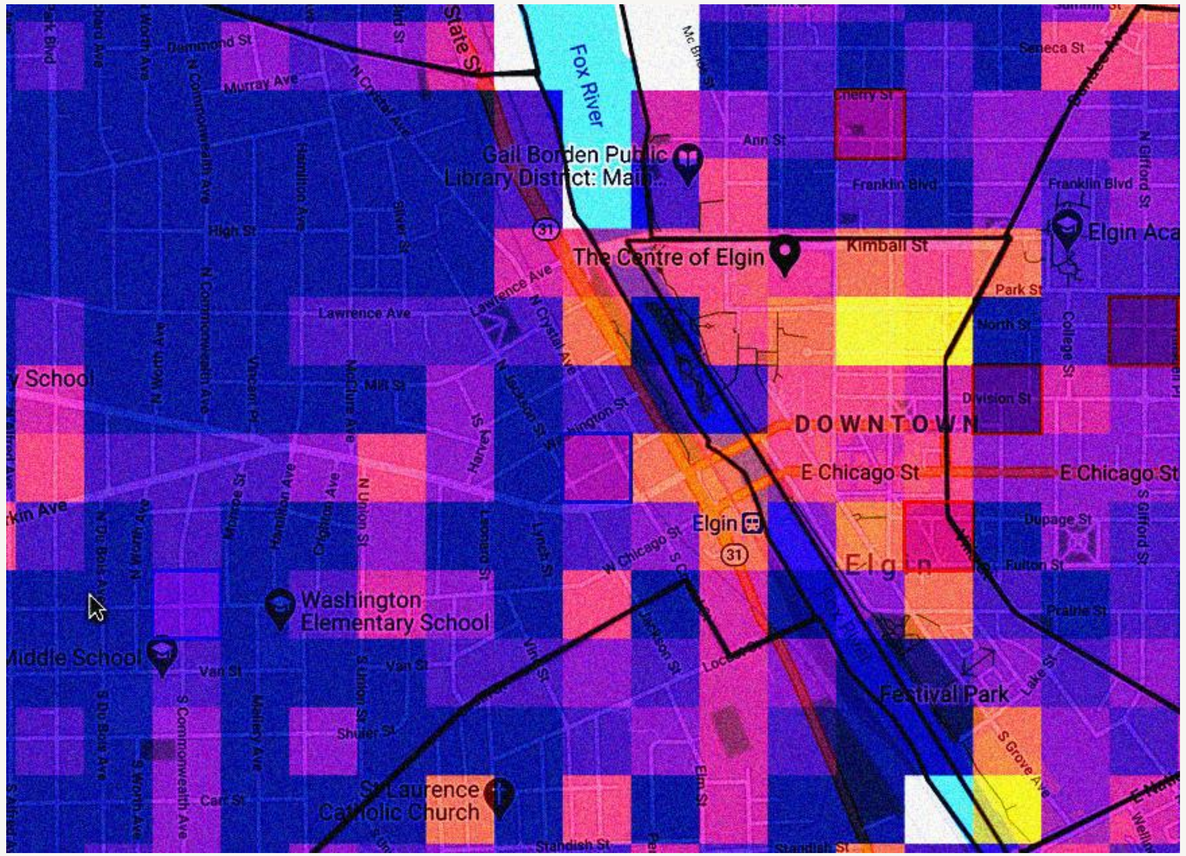
- Deterrence
- Foot patrols, direct patrols, saturation patrols
- Environmental alterations

Companies

Geolitica (formerly Predpol), SoundThinking (formerly Hunchlab), Risk Terrain Modeling (RTM)

Concerns

Bias, Error, Power, Effectiveness, De-skilling



Predictive policing strategies like PredPol = future-oriented deterrence-based policing.

WHO CREATED THE TECH?

Became “Geolitica” (winding down 2024)

Bought by “SoundThinking”

Also “Simsi”

Tech #1: Predpol (Geolitica)

Property based crimes (Burglary, car theft, theft from auto)

- Crime type
- Place
- Time

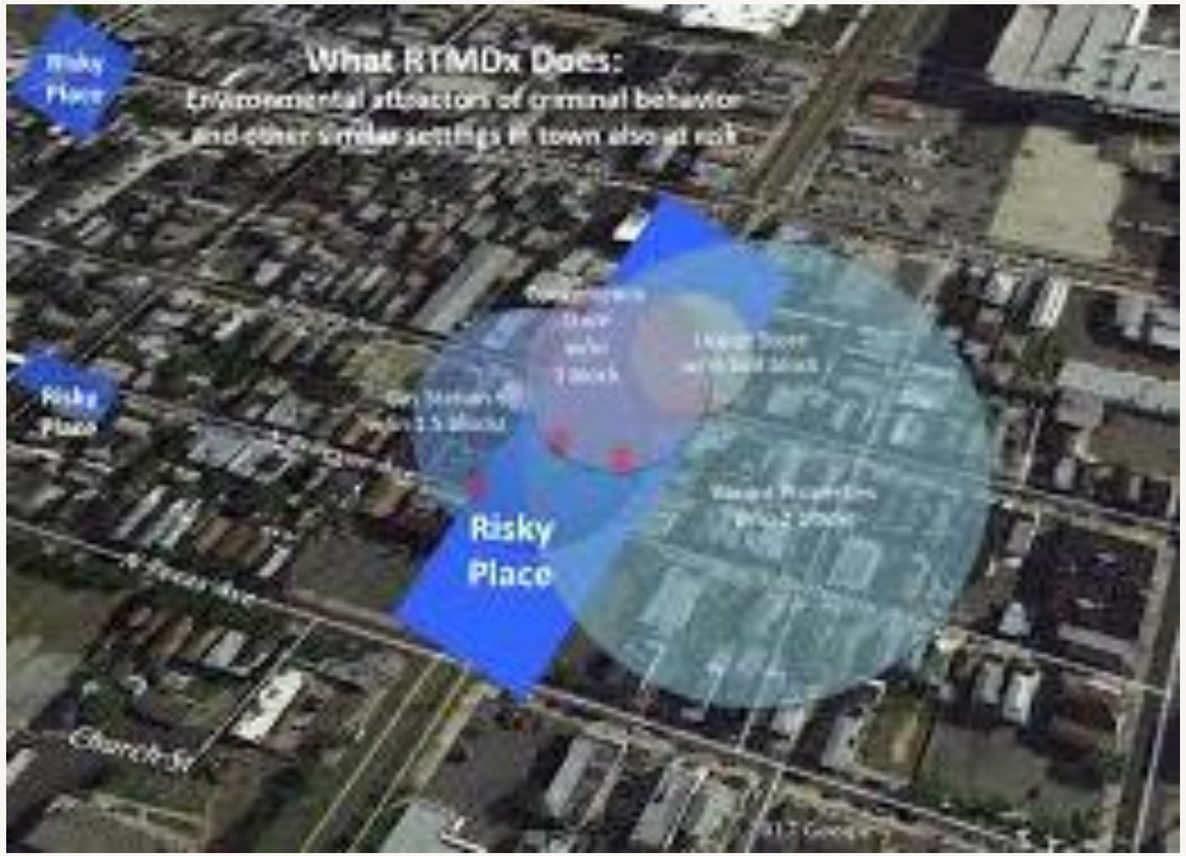
$$\lambda_n(t) = \mu_n + \sum_{t_n^i < t} \theta\omega e^{-\omega(t-t_n^i)},$$

Tech #2: Hunchlab (SoundThinking)

- Color codes crime zones
- Machine learning
- Predictions for patrol

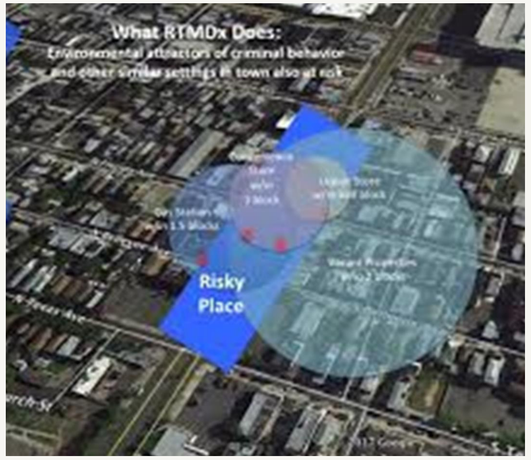
Tech #3: RTM (Simsi)

- Environmental Fixtures
- Risk Narrative
- Model physical world for places that attract risk and then offer remedies (both police-based and physical changes).

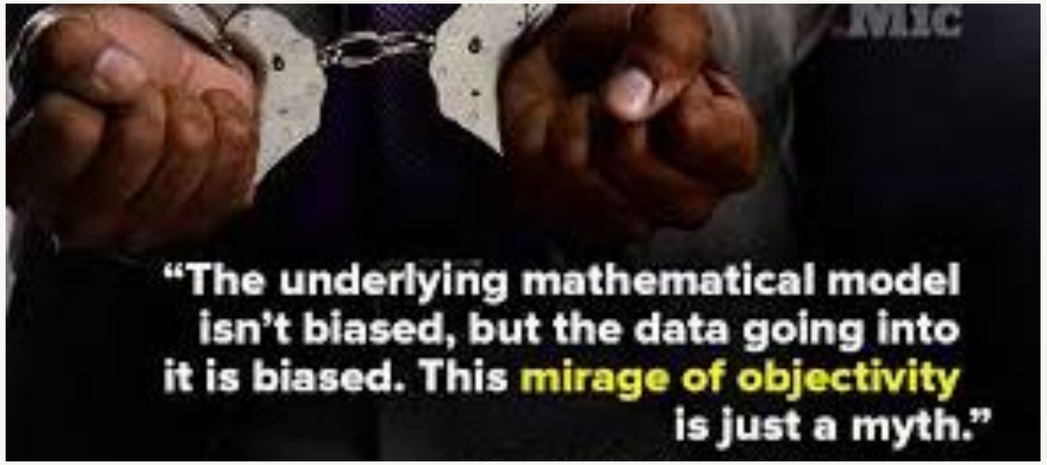


What Interventions?

- Patrol. Deterrence theory.
- Environmental Risks & Remedy



What Data?



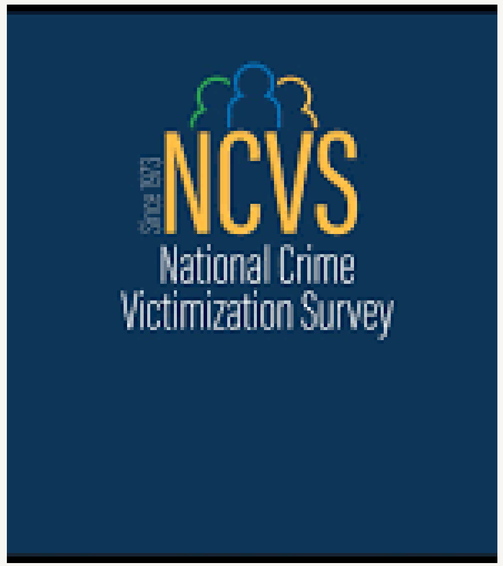
- **Calls for service or arrests or all reported crimes?**
- **Environmental risk factors?**

What Crimes?

Burglary

Automobile thefts/thefts from auto

Gun Crimes

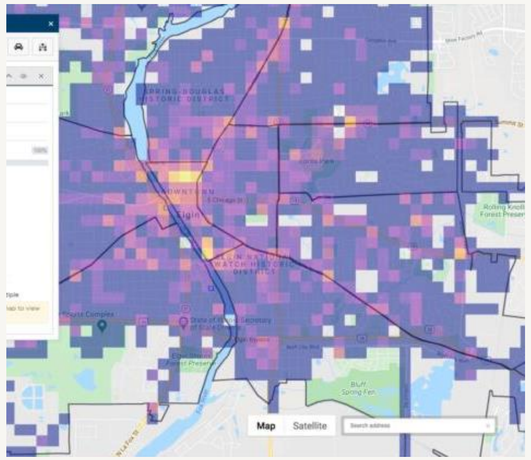


Did not cover unreported crimes, white collar crimes, interfamily crimes, etc.

What Results?

As the objective of PredPol is to provide high visibility in hotspots or locations where crimes are predicted to occur, one potential impact on the community may be an increase of police presence or enforcement in the hotspot areas. The available data appears to indicate that these hotspots are distributed throughout the Department and that the highest-volume locations are business areas (or LAPD facilities) rather than primarily residential areas.

Notwithstanding data issues, the OIG found that the impact of PredPol on the community seems to be limited by the fact that the majority of PredPol visits to a given location appeared to be very short and, in most cases, occur only a few times per month. The OIG did note some areas, however, that were subject to many visits or, in some cases, relatively long visits. The collection of more precise data – particularly data that is able to tie PredPol locations to the types of enforcement activities occurring there – would assist in determining the overall impact on the community.



- PredPol in LA shut down.
- PredPol in other places – Hard to scale. Uncertain results.
- Resource Router (SoundThinking) still in operation.
- RTM/Simsi and Newark Public Safety Collaborative

What Costs?

- Concern that police used algorithms to target poor, communities of color. Justification for over-policing using data.
- Concern that money was being diverted from supporting communities to surveilling communities.
- Concern that predicted micro-high crime areas would justify increased police stops, undermining Fourth Amendment rights in those communities.
- Concern that police focus resources on what they can measure, not all crime.

Predictive policing endures

Police patrol requires making a choice of sending patrol cars somewhere:

- What priorities?
- Who decides?
- How?
- What metrics?
- What Data?
- What Interventions?

Recommendations

- **Adoption**: Place-based predictive policing should not be adopted until the reliability and validity of predictions can be empirically tested in the real world (specific crimes in particular jurisdictions). Place-based predictive policing should not be implemented without democratic approval, clear *ex ante* policies, and meaningful audit mechanisms for community input.
- **Inputs**: Place-based predictive policing should not include police-discovered crimes as data inputs. Place-based predictive policing should not include quality of life crimes or public disorder crimes as inputs. Place-based predictive policing must avoid feedback loops around certain highly policed communities. Place-based predictive policing should prioritize transparency in data/systems, public input, and community priorities in any data-driven strategy.
- **Interventions**: Place-based predictive policing should expand beyond a mere deterrence approach. Police should be encouraged to adopt a holistic response to risk that goes beyond just policing tactics. Identification of environmental risk and crime can be addressed by non-policing interventions focused on the environment that creates the heightened risk.
- **Impacts**: Place-based predictive policing must avoid reifying race-based patrol patterns. Patrol patterns must be audited for effectiveness, transparency, and community concerns about racial bias. Predicted high risk areas should not be a factor in Fourth Amendment reasonable suspicion analysis or probable cause.

Appendix

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