# From Theory to Practical Deployment

## The Science Behind PredPol

*Policing crime patterns is hard.*

While crime may afflict the same neighborhoods year after year, the day-to-day fluctuations in where and when crimes occur are large. Extensive research has shown that day-to-day crime patterns are the result of: (1) crime generators that are fixed features of the environment; (2) repeat and near-repeat victimization that leads previous victims and their neighbors to be at greater risk of follow-on crimes; (3) the routine activity patterns of offenders that keep risk local; and (4) substantial random noise. Each of these processes is well known empirically, but when put together their impact on how crime hotspots emerge, spread and disappear is incredibly complex. It is very hard to predict where crime will occur in the next 10-12 hours given where it occurred yesterday.

Knowledge, skills and experience can reliably direct officers to the top two or three riskiest locations in their operational environment. It is much harder for them to identify and choose between locations where the risk may be lower and highly variable from day to day. If an officer chooses to go to a location typically fourth in line for crime risk, but a crime occurred at a location fifth in line on that day, then an opportunity to disrupt crime is missed.

## The Premise Behind Predictive Policing

*If one can accurately predict where and when crimes will occur, then law enforcement personnel can disrupt those crimes before they happen.*

Using high-powered mathematics and real-time crime data, PredPol evaluates yesterday's crimes in the context of all crimes occurring over a long time horizon and wide spatial field to calculate accurate probabilities of where and when crime will occur today. Officers using this information can make it harder for offenders to commit crimes in those locations leading to a net reduction in crime.

## Predictive Policing Evidence from the Field

*If predictive policing does not perform better than existing practice, or makes the job of the officer on the street harder, then it is better to stick with existing practice.*

Controlled experimental trials of PredPol were conducted with the Kent Police, UK, and Los Angeles Police Department, USA, with the goal of assessing what (if any) advantages stem from the use of predictive policing. In each experiment, PredPol was tested head-to-head against crime analysts using existing practice. PredPol predicts crime in 500' x 500' (150 m x 150 m) boxes with the number of boxes deployed in a given shift calibrated to the policing resources available. The experimental deployments involved placement of 20 prediction boxes per shift in designated policing divisions. Analysts were tasked with deploying the same number of prediction boxes per shift using all of the tools at their disposal. In Kent West Division, the analyst focused on intelligence-led policing practices, while Los Angeles Foothill Division focused on crime hot spot mapping. In the absence of directed police patrol effects, PredPol predicts between 1.6-2.5 more crime than existing practice. Increased opportunities to impact crime are therefore of a similar magnitude using PredPol.

Accurate prediction leads not only to unique opportunities to disrupt crime, but also to serve the public at the scale at which crime occurs. In live deployments in both Kent and Los Angeles, officers were directed to use available time between calls or appointments to police what they see. Kent police officers capitalized on these opportunities:

> *Whilst patrolling PredPol Zone B Harmer Street, Gravesend, Neighborhood officers attended a call to a suspicious male seen looking into vehicles. This male was seen to then break into a vehicle and due to the close proximity the officers they were quickly on scene and detained the male after a short foot chase. The male, a prolific offender, had 2 Sat Navs in his pocket stolen from 2 vehicles in Royal Pier road. If officers had not already been in the zone they would not have been in a position to catch the offender as he committed the crime.*

> *PredPol duty in Gravesend with 4 officers in 2 managed to visit all PredPol boxes at least once during the shift with different teams to show a high and varied presence, consisting of foot and mobile patrol. While checking vehicles they noticed 2 SAT NAV systems and money in the way of change on display, we traced the registered owners of the vehicles and gave them advice over the phone, which was much appreciated.*

> *From a local resident who has lived in the west side of Maidstone for many years: "great to see police around here again you have really made a big difference in cleaning up this part of town".*

Disrupting crime during each and every shift can lead to significant crime declines over time. In Kent, the first six months of PredPol deployment produced a steady decline in violent crime of -6%. In Los Angeles, the first six months of deployment saw a -12% decline in property crimes overall with a -25% decline in burglary alone.

# The Limits of Predictive Policing

## *PredPol is about predicting where and when crime will occur, not who will commit a crime.*

PredPol is not criminal profiling. It does not use any information about individuals or populations and their characteristics. The patterns inherent in the crimes themselves provide ample information to predict where and when crimes will occur in the future.

Predictive policing disrupts the short-term, situational causes of crime. It does not solve criminality, or the propensity for individuals to commit crime. Predictive policing is therefore not a replacement for policy and community engagement strategies needed to steer people clear of criminal careers in the first place.