

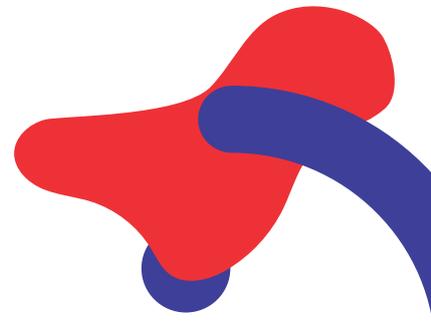


**CCI**  
CUTTING CRIME  
IMPACT

**Factsheet**

**Predictive Policing**

This Fact Sheet is based on research conducted for the CCI report "Review of State of the Art: Predictive Policing" (D2.4).



**Cutting Crime Impact (CCI)**

CCI is an EU-funded project that aims to support law enforcement agencies (LEAs) as well as relevant local and national authorities (i.e. security policymakers) in reducing the impact of crime and, where possible, preventing crime in the first place. The CCI project supports preventative, evidence-based and sustainable approaches to tackling high-impact petty crime.

**CCI will design, develop and demonstrate toolkits relating to four focus areas:**



**Predictive Policing**



**Community Policing**



**Crime Prevention through Urban Design and Planning (CP-UDP)**



**Measuring and mitigating citizens' feelings of insecurity**

**What is Predictive Policing?**

"Predictive policing is the collection and analysis of data about previous crimes for identification and statistical prediction of individuals or geospatial areas with an increased probability of criminal activity to help developing policing intervention and prevention strategies and tactics."<sup>1</sup> Predictive policing also uses data from other sources, including socioeconomic data and traffic networks.

**Background to predictive policing**

Information about crime incidents has long been recognised as an important element of police work. Since the 1990s, Geographic Information Systems (GIS) have been contributing to the processing and visualisation of such information through new technologies, providing 'crime maps'.

In 1995, the New York police force pioneered pattern-based prediction in which the analysis of large crime data sets became a key principle guiding policing strategies – called 'COMPSTAT'.

Predictive Policing uses historical data and applies mathematical and statistical methods to calculate risk areas where crime is likely to occur. The approach is most commonly applied to tackling domestic burglary and vehicle theft.

Most LEAs use externally developed software, either purchased from a company or developed in cooperation with scientific institutions – few LEAs use in-house developed software. Most of these tools are based on the 'Near-Repeat-Approach', which states that after an initial offence, the risk of another crime in close spatial and temporal proximity increases.

<sup>1</sup> Meijer, A. and Wessels, M. (2019) "Predictive Policing: Review of Benefits and Drawbacks", *International Journal of Public Administration*, p. 3.

# Predictive Policing Process



## Four-step cycle of prediction led process:

1. The comprehensive collection of quantitative data, which is essential for accurate predictions.
2. The actual analysis of the data.
3. The prediction of crime.
4. Specific police measures / operations preventing crime through deterrence or arrests of offenders.

Fig.1 Prediction-led process (Perry et al.,2013)

## How is crime being addressed?

Software-based analytic approaches to predictive policing tend to have different orientations:



### Targeting places of property crime

(e.g. domestic burglary, vehicle theft). Such crimes are reported to police in the majority of cases. They are currently considered to be the most predictable crimes.



### Targeting places of violent crime

(e.g. robberies, shootings). Traditional factors from hot spot policing were adapted and supplemented with additional data to predict violent crimes in urban areas.



### Targeting persons involved in criminal activity

(e.g. offenders, victims). Analysis of an individual's social environment, factors that might not yet have been considered in traditional police analysis.

## Ethical concerns

- Data selection and machine bias.
- Individuals can be directly affected by biased data. These sources are not only used for place-based predictions, but also for person-based predictions.
- Visualisation and interpretation forecast.
- Time and effectiveness still unclear.
- Stigmatisation of environments.

## Legal concerns

- Weak correlations between the traits and criminality can throw up false positive outcomes. People who are not involved in a crime are targeted (Media4sec, 2018).
- Right to human review of individual automated decisions.

## Social concerns

- Communities right to review decision of LEAs.
- Transparency, accountability and trust.

## Experiences in Europe

### Germany

Due to rising crime rates in domestic burglary in Germany, Predictive Policing was introduced in 2014. Different systems have been developed across the sixteen federal states. In 2014, the police of Lower Saxony started its first project in collaboration with IBM and the Karlsruhe Institute for Technology. This pilot project inspired the development of Predictive Policing software called PreMap (Predictive Mobile Analytics for Police). PreMap was created by the LEA and builds on the near-repeat approach to crime.

The LKA (State Office of Criminal Investigation Lower Saxony) chose to develop its own software, because it did not want to share police data with external companies and had the necessary IT resource. Predictive Policing is used in Lower Saxony to increase patrolling in areas at risk of crime. Potential offenders should be deterred or arrested whilst attempting to commit burglary. PreMap also provides a so-called 'Crime Radar' that maps offences relevant to public spaces over the last four weeks.

## Germany

In Lower Saxony, the pilot phase of PreMap has shown that there is still room for PreMap's further development in order to increase its effectiveness as a tool in the strategic alignment of the police. In particular:

- **In the identification and representation of risk areas to make them easier to understand for police officers.**

- **In the identification and deployment of measures in response to the identified risks. The focus is currently on the deployment of police officers. However, personnel resources are limited and this might not be the only – or most effective – response.**

## Netherlands

Intelligence-led policing was adopted in the Netherlands in 2013 when creating the Crime Anticipation System (CAS). This data-driven system predicts crime through analysis of statistics from three sources: Central Crime Database (BVI), Municipal Administration (GBA or BRP since 2014) and Demographics from Statistics Netherlands (CBS). CAS is a spatiotemporal prediction system that identifies crime 'hot spots' and 'hot times' — rather than high-risk individuals. CAS presents the data in the form of 'heat maps', highlighting places at risk of high-impact crime. The map influences the advice that the intelligence officers provide during an

operational briefing to police officers. The predictive heat map is used to inform the allocation of police resources. Moreover, the results are used in meetings with key stakeholders in the prevention of crime. CAS is suitable for certain types of crime, such as burglary, robbery and theft (specifically pick-pocketing), although it is also used to provide some information about offenders. Nevertheless, the Dutch police as well as other national and local authorities also use other instruments which are more offender-oriented—i.e. concerned with identifying repeat offenders.

## Key messages from CCI

Predictive Policing does not replace traditional policing. It is one of the tools/strategies available to support the police.

The implementation of such a tool must be researched to better understand how benefit can be gained from the technology and from innovative management practices.

Predictive Policing could lead to better decision-making processes and potentially less biased and standardised decisions if the methods are properly tested and the data selection and analysis continue to be improved (quality and quantity of the data).

In terms of crime prevention, results of Predictive Policing are a matter of debate. There are suggestions that potential offenders may seek opportunities in locations that are not being patrolled.<sup>2</sup>

Crime is a complex phenomenon affected by various factors, which have to be taken into account in the context of Predictive Policing and the quality of predictions. The inferences made from police data (and other data sources) do not provide a direct view into the future, but can be useful to identify risk and improve LEA management practices.

<sup>2</sup> Summers, L. D. and Rossmo, K. (2018) "Offender interviews: implications for intelligence-led policing", *Policing: An International Journal*, vol. 42, Issue: 1, pp.31–42

If you would like further information about Cutting Crime Impact, please contact: **Noreen Muzaffar**, CCI Project Officer at the University of Salford at [n.muzaffar@salford.ac.uk](mailto:n.muzaffar@salford.ac.uk) or **Pilar De La Torre** at Efus at [delatorre@efus.eu](mailto:delatorre@efus.eu)