Fighting against petty crimes

New methods to prevent, investigate and mitigate high impact petty crimes

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Abstract: *As a side effect of globalisation and massive cyber services the number of crimes both perpetrated at local and global level is growing up. Governments and Law Enforcement Agencies are aware of this and look for potential countermeasures not only following traditional approaches but even considering potential benefits provided by cyber technologies. This document will consider the situation within the European Union and the need to define a common approach to fight against a problem that, on the side of criminals, is many times, already based on a common strategy. Criminals started long time ago to take advantage from the global networking, social media, telecommunication means and darknet, this is valid for a wide range of crimes from terrorism and illicit trade to petty crimes. European member states and the Union agree on the need to develop and European Security Model to fight against the renewed set of threats that may jeopardise the EU. This document will focus mainly on the fight against petty crimes and the added value associated to a common platform to share information, knowledge and best practice among LEAs.*

Introduction

The globalization of communications and finance infrastructure allows for cybercrime to develop, and corruption and financial crime to take new forms. Cyber criminality is a phenomenon by which criminal acts with new tools and within a new environment, which is not satisfactorily understood, nor properly addressed. The same applies to the innovative technologies and methodologies for financial crime and more in general illicit trade and trafficking. Law Enforcement Agencies (LEAs) need new equipment to counter such developments. The EU law enforcement agencies will benefit from improving and consolidating knowledge about security problems and their remedies.

There are a number of significant common threats which have a cross-border impact on security and safety within the EU, and security has become a key factor in ensuring a high quality of life in the European society and in protecting our critical infrastructures through preventing and tackling common threats. The European Union must prevent, and if necessary investigate and mitigate the impact of criminal acts, whilst protecting fundamental rights of its citizens. The consistent efforts made by the EU Member States and the Union to that effect are not enough, especially when criminal groups and their activities have origins and connections outside the EU expand far beyond EU

member states national borders. European member states and the Union urge the definition of a common platform to ensure security, a European Security Model.

The definition of a European Security Model (ESM) which builds upon the analysis of the human factors at the roots of the design of security strategies and methodologies, is needed. Such a Model would encompass:

- the development of a common understanding of security issues among EU security practitioners, as well as of the causes and effects of insecurity among EU citizens;
- common EU methodologies to be implemented by security practitioners (about enhancing prevention and anticipation and/or the timely involvement of all the actors that have a role in protection from the political, economic and social scene).

Crime prevention initiatives

A number of crime prevention toolkits have been developed by international organizations to provide practical guidance to practitioners and policy makers. They provide background information, and outline practical steps and models of effective approaches and practice. They are valuable resources especially at the local level, for technical assistance and more generally for the promotion of crime prevention approaches. A number of guides have been developed by international agencies, and reflect the priorities of those agencies.

Tools to promote participatory approaches to prevention are less common, although there is an increasing range on women's safety audits. Furthermore, in addition to access to teaching, training resources and tools, practitioners and policy-makers need to be able to exchange experience and knowledge with others, both as a key component for building capacity, and for further professional development. Establishing professional networks of support and expertise is important in crime prevention where its development and implementation is recent. For those developing initiatives and practice in developing and transitional contexts, in particular, networks to exchange experience and support at the local level are the key in securing policy-level support and resources for innovation. Internationally there is a need to facilitate intra- and inter-regional exchange of experience.

Thanks to the wide diffusion of mobile devices a number of apps for crime reporting and monitoring are already available on the market:

Santa Cruz Police 2011 (USA) - The application provides different services including: alerts, wanted list, crime maps, available photos and videos to look at). Santa Cruz Police has also PredPol;

New York City App NYPD 2013 (USA) – It is similar to Santa Cruz Police;

PredPol (USA) - it is the leader in predictive policing software. It makes it possible to predict and prevent crime. PredPol grew out of a research project between the Los Angeles Police Department and UCLA. Working with mathematicians and behavioural scientists from UCLA and Santa Clara University, the team evaluated a wide variety of data types and behavioural and forecasting models. The models were further refined with crime analysts and officers from LAPD and the Santa Cruz Police Department. They ultimately determined that the three most objective data points collected by police departments provided the best input data for forecasting:

- Crime type
- Crime location
- Crime date and time

PredPol uses only three data points in making predictions: past type of crime, place of crime and time of crime. It uses no personal information about individuals or groups of individuals, eliminating any personal liberties and profiling concerns. For many jurisdictions, predictive policing strategy encourages patrol officers to work as partners with communities in the locations where crime is most likely to occur. PredPol is one of the tools to guide location-based strategies in which law enforcement officers communicate and build relationships with residents to engage them in community crime watch efforts. PredPol is not:

- Mapping of past crimes or another 'hotspot' tool
- A predictor of who will commit crimes
- Profiling of individuals or demographic groups
- A replacement for veterans' or analysts' intuition and experience
- New hardware or additional hiring

PredPol is:

- A tool to increase law enforcement's odds of stopping crime
- A predictor of where and when a type of crime is most likely to occur
- A technology for any jurisdiction of any size
- A way to bring newer officers up to speed faster
- Easily accessible and available immediately where and when it is needed

iSpoTAcrime (USA) - it allows to upload photos and videos, voice comments + GPS location + there is a panic button for emergencies (it makes loud noises)

Tip Submit (USA) - Just like the one above but the user can decide to whom send the report (federal police, schools in the networks, etc..)

iWitness (USA) - virtual witness to crimes. Simple touch: 1. Emission of steady light, 2. Audio and video recording, 3. GPS localization that goes to the police. With a second touch: 1. Call to 911, 2. Loud noise, 3. Text message to 6 contacts already chosen.

CrimePush (USA) - it sends the GPS position to 911, calls family and friends and uploads crime reports. Reports go only to the agencies that have integrated their system with the app.

Citizen (USA) - (formerly Vigilante), 2017 March. Vigilante (October 2016) had a short life span. It was pulled from the App store about 48 h. after it launched due to safety concerns. Now it is back as Citizen, a crime avoidance tool for metropolitan areas. It makes you aware of crimes and incidents reported to 911 that may be going on around you. This information could help you stay safe. At the moment only in NY. www.citizen.com

Facewatch London (UK): the application main aim is to recognize people involved in riots, criminal events, etc.

Justwatch (IT) - the interface allows for two types of action: active participation of the user through reporting of threatening situations and geo-localization and passive participation of the user identifying the area of interest and receiving notifications. The test phase was in Torino's neighbourhood Campidoglio with the cooperation of Torino Living Lab. The veracity of the reports is guaranteed through a feedback system. Information from users with negative feedback is not considered.

iWatch (USA) - Dallas, Philadelphia and other 70 US cities: makes it possible to send geolocalized reports with photos, videos and text. With a click you can send a report, take a picture or a video. The alarm goes directly to the police department together with the GPS location. Users may remain anonymous. The Police department can send information through the app such as meteo alerts, exceptional events, traffic, etc. … It has crime maps.

SOS Save our students (USA) - report bullying in school

Safe Trek (Noolight) (USA) - Hold until safe: it's an emergency button that you can keep in your hand when walking through potentially dangerous places. Mitigate safety concerns through a quick and effective tool for calling the police. When in a dangerous situation just press the button. Release it only once safety is confirmed. A PIN code is required within 10 seconds of releasing the button. If you fail to enter the code, this will trigger a 24-hour call service that will summon the police for you.

Citycop (UY) – This APP has been developed in Uruguay. A team of engineers, designers and communication experts developed a smartphone app that provides a map with the indication of crimes

and risks. The user can choose the area of interest and the app will send him/her notifications that he/she will be able to share through social media. The app was installed by 25.000 users and 20.000 crime reports were already sent through the app.

KeyCrime (IT) - Questura di Milano it has been working since 2007. For each new crime events it elaborates: place, time, type of crime, target characteristics, criminal profile and it compares these data with the crime events in the past. It can highlight similarities, seriality and address the investigators towards potential and possible new targets.

iCarabinieri (IT) - mobile application enabling direct connection with police offices (Carabinieri) providing the location of the closest open office, opportunity to enlist the specific criminal act, etc. etc. (http://www.carabinieri.it/cittadino/download/icarabinieri)

YouPol (IT) - The APP aims to allow everyone, young people and adults, to interact with the State Police, allowing the sending of reports of incidents of bullying or drug dealing. The application, born from the firm belief that every citizen is a responsible and active part in the democratic life of the country, is easily "downloadable" on all smartphones and tablets by accessing the Apple Store platforms, IOS operating systems, and Play Store, for Android operating systems. Thanks to "YOU POL" it is possible to send images or written reports directly to the operations room of the Police Headquarters, even if the signalling person is in a different province. It will therefore be allowed to report to the police authority facts of which there are direct witnesses (including photos or images acquired on your device) or news that you have learned in a mediated form (links, web pages, receiving messages, oral information, etc.). The aforementioned planning also guarantees the so-called "geo-referencing" (exact location) of the signalling device and of the place affected by the event (even if distant from each other). Among the possible options for the user of "YOU POL" there is also one that allows you to make an emergency call (through the red button with the word "emergency call") to the operating room (113 or 112 NUE if present) located in the province where the user is located.

NORA (IT) - mobile application devoted to violence against women. The project consists primarily of a wearable hardware that is not only aesthetically beautiful but thought to be "wearable" in different environments and situations (such as night out with friends, gala dinner or running). The basic idea is therefore to integrate within a piece of jewellery extremely appealing for the female users (using a design created by large globally recognized brands) an alarm system that not only "reacts" in case of violence but, that allows to generate an immediate and automatic alarm in case the user is not in the condition to start the signal. The system has been named: N.O.R.A. (New Object for Rapid Assistance).

ODINO (IT) - mobile LEA application providing different services: quick citizens identification, integrated access to criminal records, on the fly car plate identification, etc etc. The application suite

O.D.I.N.O. was created in collaboration with the Arma dei Carabinieri, and represents the excellence in the professional and public security sector. Developed on various devices by using Samsung Knox technology to make the system safe and impenetrable, the platform can be installed on different size devices, depending on its operational use. The solution can be used by the operator when he is on foot, or it can be mounted on motorcycles, or installed on board of a police car. The connection is ensured by devices such as: 3G, LTE, 4G/LTE advanced, WIFI, Bluetooth modem, able to cover all the current possibilities of connection present on the market. The O.D.I.N.O. system is integrated with IntelliKore Operation Centre. Among the main functions: constant geolocation, reception of multimedia files sent from the field (photo, video, video streaming, audio streaming), management of the alarm signals sent by patrols and of the bi-directional chat messaging service. O.D.I.N.O. and

INTELLIKORE (IT) - are currently used at the General Headquarters of the Arma dei Carabinieri. http://www.intellitronika.com/en/odino/ and video https://www.youtube.com/watch?v=z1si4EXm9rQ

Harassmap (ET) – It is a social initiative implementing an SMS system for reporting incidences of sexual harassment in Egypt. This tool gives women a way to anonymously report incidences of sexual harassment as soon as they happen, using a simple text message from their mobile phone. As Egypt's 55 million mobile phone subscribers grow in number by an average of 10% each year, Harassmap's use of new mobile technology and innovative marketing is changing social outreach in Egypt, while invoking an older tradition of public safety for women. By mapping SMS reports on a public website displaying location and details provided by the victim, the Advocacy Online Map creates a powerful documentation of the extent of the problem. The Assistance Information and Referral System - HM provides victims with a list of services; Police Response - HM will pinpoint hotspots to increase police presence in high harassment areas. Further projects include community outreach activities, social media awareness and blogging campaigns against sexual harassment. The entire Harassmap system acts as an advocacy, prevention, and response tool, highlighting the severity and pervasiveness of the problem, as well as offering proactive responses.

Zabatak (ET) - is a non-profit initiative led by group of young people that aim to fight corruption and to make Egypt safe and free from bribery and corruption. Politically unaffiliated and having no specific political orientation, Zabatak was established to gather information about criminal, corrupt or semi-legal activities that could be useful to the ordinary citizen. It has already become a reliable centre of news. Zabatak also carries potential for further development.

The perception of risk has been studied by phycologists since a long time ago, in recent times the use of virtual reality technology enabled in depths analysis of this phenomenon. Psychologists skilled in perception of safety and security recently developed a research on perception of risks in the urban environment thanks to virtual reality environments. A sample of citizens experienced a tour in a virtual city, the "environment" was characterized by an increasing number of "traces" of potential

personal risks: graffiti, damages public and private properties, fires and burned objects, bad looking people and more. The system analyses the different levels of perception of un-safety due to different sample of citizens.

Petty Crimes

In the general framework of a European Security Model (ESM) this document will consider the specific section devoted to Petty Crimes describing a future European platform providing specific services to fight against petty crimes. The idea to create a common platform at EU level in order to fight against petty crimes and mitigate their effects represents a potential added value service for citizens.

Petty crime is a challenging issue to deal with due to the fact that it is a loosely defined term which covers a very broad range of criminal acts. The idea of high-impact petty crime is almost a contradiction in terms unless we are considering it as a high-volume phenomenon with longer-term and broader impacts on society, including quality of life for citizens, general feeling of security and regional reputation, which can have negative economic affects especially in areas dependent on tourism, or areas seeking to attract commercial investment. In many cases individual instances of petty crime go unnoticed by the victim (e.g., credit card scams that are limited to small amounts at each instance) and it is often unreported, sometimes due to the perceived lack of seriousness or perhaps the perceived waste of time. Tourists, for example, due to the limited amount of time they spend in a locality where they experience petty crime may defer their complaints to online forums and social media. In other situations, single instances of petty crime can have significant personal impacts on victims, such as people living in more isolated, rural settings who may experience heightened fear and nervousness. But over a longer time period and in conjunction with various other spatial, social and economic factors petty crime is a problem that is linked also to changing socio-economic factors.

According to Europol: "*Economic decline is likely to entail a rise in petty, non-organised forms of criminality including social benefit fraud or theft. These activities will also be carried out by Organised Crime Groups (OCGs) masking their activities as petty criminality but orchestrating large-scale criminal enterprises with complex structures. The potential emergence of a culture of distrust is particularly threatening and could benefit OCGs by undermining citizens' trust in the authorities and increasing the appeal of organised crime as a provider of goods and employment.*[1] (Europol, 2015).

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[1] file:///Users/test/Downloads/Europol_OrgCrimeReport_web-final_0.pdf

More recently Europol: "***A highly visible crime that causes widespread feelings of insecurity among citizens*** *- Motor vehicle crime, domestic and business burglaries, pickpocketing and ATM attacks are some of the most common forms of organised property crime conducted by cross-border organised criminal groups. A most visible form of crime, organised property crime has the potential to cause widespread feelings of insecurity, not least among vulnerable groups such as the elderly, who are often the targets of "dear nephew" and other "trick" thefts and pickpocketing. Crimes in this category are often committed by highly mobile organised crime groups that, often exploiting diaspora communities in Member States to create networks of contacts, anchor points and logistical support, typically carry out a significant number of offences in a region over a short period before moving on. As organised property crimes are often investigated in insolation at the local level, an analysis at the national level is often lacking, making these crimes harder to detect and, consequently, to solve. In many cases, incidents of property crime are still classified as petty criminality without recognising the organised crime aspect.*" (Europol, 2018)

Therefore, it is also worth pointing out that, while this topic is specifically about petty crime, as distinct from more serious crime (e.g., murder, rape, armed robbery, etc.), financial crime and corruption (which in itself may have significantly high impacts), terrorism, and so on, the relationship between these is not easy to disentangle. Petty crimes are sometimes perpetrated by lone individuals but it is often a modus operandi (MO) for organised crime and even terrorist groups as low-profile illegal revenue sources.

It is clearly of little value to focus our efforts on a single form of crime or handful of common crimes, or indeed on one or another context of crime such as public transport or concerts, without considering how we increase our knowledge of the phenomenon of petty crime and measuring its impact, in the first place, and then providing LEAs and policy makers with the necessary technological tools and knowledge resources to be able to achieve a flexible yet comprehensive approach to the spectrum of petty crime, particularly when it is judged by the key stakeholders to have a high impact.

While the nature of petty crime, as an act, is open to interpretation with reference to different factors, so is the impact of crime because it can be measured in a variety of different ways corresponding to different KPIs[2]. The direct and overall financial impact of theft through shoplifting or card skimming may be high in aggregate but low in each instance. However, as a knock-on effect, the black economy which may be seen by some as victimless may have repercussions for businesses, employment and tax revenues. The reputational effect of petty crime on localities may also be substantial and have economic impacts such as deterring tourism or commercial and industrial investment as well as impacting property values. The presence of crime and more specifically of petty crime in a quarter of

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[2] Key performance indicator

the city where it was not present in the past use to impact the demand on real-estate market and consequently the economic value of properties. Another significant impact of petty crimes is on the public's confidence, sense of security, perceived vulnerability, etc., which can impact citizens' freedom to go on their daily lives. Elderly people are a growing sector of European population, petty crimes have a high impact on them and may cause permanent damages. If petty crime within a locality is not controlled and reduced the resulting socioeconomic effects can, as Europol has indicated, lead to the growth of organised crime and possible disaffection with society as a whole leaving open the door to other extremist options.

The study partially described in the present document focus on a European Security Model that, apart from other services pertaining law enforcement agencies, involves the citizen as part of the solution to the problem of petty crimes through safe bidirectional communication channels, guidance for educational and training programs and through assessing the attitudes and perceptions of citizens towards their security, policing relationships and their role in crime prevention. This approach finds its fundamentals on human factors approaching the problem from the active actor's side to mitigate the problem, this seems to be the best approach both for "suburbs" and terrorist's proselytism among young generation.

The human-factors centred European Security Model will enable:

1. Better understanding of the problem based on the model (causes and affects);
2. Easier identification of the solutions;
3. Basis for evaluation of solutions;
4. Consistent understanding of the issues across borders (standards, terminology, concepts);
5. Citizen-centred approach, allowing the citizen to be a greater part of the solution in a safe and responsible manner.

The foreseen solution presents a knowledge-based platform comprising a set of integrated data collection, processing, management and visualisation tools to assist policy-makers and LEAs at the strategic and tactical/operational tiers respectively, in their fight against high impact petty crimes in the prevention, investigation and mitigation spheres.

In its technological dimension, the solution involves the design and development of mechanisms to gather and share data, process high amounts of structured and unstructured data and generate relevant high-quality crime-related information and actionable intelligence alerts that are presented in rich formats to meet the particular contexts and the specific needs and expectations of its users: policy-makers and LEAs at the local, national and European levels.

In addition, the platform engages the citizen, both as a valuable source of information (human intelligence e.g., as crime reports or surveys on feelings of security and perception of risk) and as a recipient for general security and safety information, security alerts and instructions.

The technological component complies with and abides to the Global Gravity Factor and Impact Matrix, whose meta-model principle ensures the adequate selection and instantiation of the Platform's tools, capabilities and outputs to meet the goals, needs and context of each particular user organisation

The gravity factor and impact matrix look at the different categories and definitions of crime, their impact based on a range of different criteria (country, location, socio-political contest, financial cost, social cost, average age of offender, etc.), the available mitigation and prevention tools and the resource implications of taking different responses. The matrix is one of the key components of an ad hoc designed software platform that will assist in the management and operational implementation of the gravity factor matrix through: data gathering (sensors and human reports), data processing, analysis, data fusion, data visualisation, decision support and communication. The design of similar platform it is not easy, in the EU there are no similar legislation and principles, something is forbidden in one country and allowed in others, some behaviour is censored in one country and accepted in others.

A key element in the platform is its embedded capability to share data and intelligence among LEAs and EU policy-making organisation, while respecting data ownership rights and enforcing security rules and protocols. As such, a pan-European model is envisaged where policy-makers and LEAs allow access to (raw and processed) data via an "Information Sharing Module", according to established access control rules. Dedicated intuitive and easy-to-use interfaces will allow LEA officers and policy-makers to access, visualise and download the information / intelligence required.

The real time "Information Sharing Module" works through different channels: the public one directly addressing citizens informing about correct behaviours to minimize potential harms, and the private channel to share information about intelligence, crime's new trends, best practice and more addressing EU law enforcement agencies.

The platform is structured in three different layers: Information, Knowledge, and Tools. The two main modules: Information Sources module, Distributed Knowledge module provide the basis for the LEAs toolkit module and policy-makers toolkit module. We will not get much more in detail regarding the first two main modules providing a short overview on the last two parallel modules, LEAs toolkit and policy makers.

LEAs toolkit module is a tool to deliver valuable capabilities that support LEAs in their daily crime-fighting operations, considering the visualisation of petty crime data, forecasting, risk analysis, best practice, lessons learned and decision support (alerts on potential surges of petty crimes,

recommendations on course of action and relevant security measures, training and educational materials, Apps to interact with citizens).

Policy-makers Toolkit module is a tool to deliver valuable outputs that support policy-makers understand the economic, legal, ethical and societal perspectives of security policies, assess the societal impact of security policies, determine evaluation methodologies for security policies and identify new security policies (reports, public survey results, statistics, infographics, recommendations on security policies).

Gravity Factor and Impact Matrix

As already stated on top of all these modules we place the core of the system, the Gravity Factor and Impact Matrix. Due to the wide range of elements that may influence this matrix we cannot refer to a simple static matrix, there is a need to implement a Dynamic Risk Assessment methodology.

In our vision there are different factors influencing the "gravity" of a crime due to: geographic location, local regulations, local crime tolerance and perception, time context, behaviour of media, specific situation, socio-political environment, etc. It is quite a challenge to consider all of them without biases and approximations.

Geographic location: laws and regulations change from country to country as well as petty crime typology, some drugs are allowed in some EU countries not in other, some countries are much more concerned about petty crime due to soccer match, or violence on women other less. More or less the same applies to Crime Tolerance and Crime Perception.

Time Context: the gravity and perception of some crimes change significantly through the time even due to changes in ethics and moral principles, sometimes "old" crimes that disappeared time ago are back due to social changes the reverse is valid as well.

Influence due to Media: in the age of Internet and Breaking News the role of media in disseminating information (good and bad – informing citizens or organising crimes and even promoting them or providing fake news) is more than relevant, it may deeply affect the perception of crimes and the feelings of citizens. Sometimes it is enough the way we entitle news to obtain the foreseen or required feedback from citizens. Temporary flooding of news about a specific set of crimes (even if not so relevant and not more frequent) may generate a feeling of danger and scare in citizens sometimes igniting dangerous behaviours (amplified reactions).

Specific circumstances and the socio-political environment influence as well the gravity and perception of some crimes: the victim is a girl or a disabled person, the suspect belongs to a specific ethnic group, the crime pertains to a suburban area of the city, a well-known dangerous quarter and

so on. All these aspects suggest to consider a dynamic approach and structure on different layers in designing our "matrix".

The Gravity Factor Impact Matrix – in the light of knowledge ecology - this may lead to take into consideration a layered Impact Matrix, devoting one layer for each member country having as "sub-layers" the local aspects described in above and at least one layer due to all the specific "impact factors" due to the context e.g. behaviour of media and news (new make some family of crimes more impacting on people). This matrix, time dependent, is the basis to collect and share information and solutions among EU law enforcement agencies.

Social and educational approaches to crime prevention are concerned with strengthening the capacities of individuals, families, or groups to live healthy, productive and pro-social lives, and reduce their chances of being victimized or becoming involved in offending. They include a wide range of practices, and are often targeted towards families, children and young people, since these are the age groups most at risk, and when interventions can have the most impact.

Based on the ICCS (International Classification of Crime for Statistical Purposes) and on the categories of crimes used in the International and EU Victimisation Surveys (ICVS and EU ICS), eleven types of crimes plus some non-conventional crimes, are divided into 4 categories:

- Vehicle-related crimes (theft of a car, theft from car, car vandalism, theft of motorcycle, theft of bicycle);
- Burglary (burglary, attempted burglary, theft of personal property and pickpocketing);
- Contact crimes (robbery, sexual offences, assault and threats);
- Non-conventional crimes (consumer fraud, corruption, hate crimes in the EU, exposure to drug-related problems).

As an additional option to better tune the platform the expert team will focus on different concrete use cases, that in our opinion could allow for the development of crime prevention, mitigation and investigation toolkits to be also applied in wider environments or targets.

Conclusions

The foreseen platform will represent a tile of the entire European Security Model mosaic. There is a clear need for new approaches and tools to face the recent generation of threats enjoying the absence of internal EU borders and the power of cyber technology. The international travel flows continue to rise, there is growing pressure to process large volumes of people and goods at international crossing points, migrants flow at external borders put under stress the entire European region. This situation facilitates the growth of organised crime and possible disaffection with society as a whole leaving open the door to other extremist options. Petty crimes are integral part of this mosaic being in some way the entry point for a general perception of insecurity and negatively impact the quality of citizens' life.

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