

Industry & Research Days

Security Delta (HSD), The Hague Netherlands

6 – 8 September 2022

This document highlights the outcomes gathered from a series of Practitioner Workshops organised and conducted by the i-LEAD team. Please review the material and note in the [Industry Days 3.0 application](#) the areas that your solution or service would be able to support.

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Common Trends

The tables below provide information on technologies related to various crimes. We do encourage readers to read the entire document, if possible, as it expands on topics covered in previous Practitioner Workshops.

Technology & Research Providers

Please familiarise yourselves with the high-level gaps and needs gathered during a series of practitioner workshops facilitated through the i-LEAD project. You are free to apply for the i-LEAD event to address any of the challenges outlined below. The process for applying is illustrated in the image. If anything is unclear, please contact the organising team via frontoffice@enlets.eu.

- 1 Fill out and submit the brief registration form with your organisation's information.
- 2 Attach a 3-5-minute introductory video/presentation to your tool/service.
- 3 Practitioners will review and shortlist the videos.
- 4 Shortlisted companies will receive an official invitation to the event.

[Apply to Present!](#)



| MOBILE HIJACKING | | |
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| Short Description | Description | Area |
| Surveillance Software for Satellite Phones and Encrypted Applications | Some current telephone tapping technologies have grown obsolete, and LEAs seek more effective methods for intercepting and monitoring satellite communications. LEAs require (unmanned) monitoring technologies for real-time coordination with other countries and to hinder culprits' ability to move freely between those countries. The system should also allow for real-time information exchange about (possible) suspects. | Technology |
| Open-Source Intelligence (OSINT) in Numerous Languages | LEAs demand OSINT that allows for easy data interchange and simultaneous interpretation, resulting in useable intelligence in multiple languages. | Technology |
| Speech-to-text Transcription Software | Audio transcription software that swiftly converts audio and video files to text is required by practitioners. | Technology |
| ANPR Software | Enhanced Automatic Number-Plate Recognition (ANPR) software is required, as well as cell site analysis software that is compatible with portable handheld devices. | Technology |

| VEHICLE MITIGATION | | |
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| <p>Pursuit activity and use of pursuit tactics are likely to place members of the public and police officers under a significant degree of risk. Wherever possible, trying to prevent a pursuit from taking place must be a primary consideration.</p> <p>Preventative tactics are those which can be used to prevent a pursuit from taking place. An officer may find themselves behind suspect vehicles and drivers in the normal flow of traffic. The driver of the subject vehicle may remain unaware of the police interest or decide to continue driving normally in the hope the officer's presence is coincidental. During this period, there is time to consider the use of preventive and pre-emptive tactics.</p> <p>Where preventive or pre-emptive actions are clearly proportionate to the intelligence available, their use is preferable to pursuit. Where an intervention before the subject vehicle moves off is not possible or is unlikely to succeed before the subject is alerted, then the police may have little choice but to conduct an intervention against a moving or a momentarily stationary vehicle.</p> <p>To assist with improving police and public safety in this operational context, law enforcement agencies need to consider how they might better use science and technology to provide a solution to the operational needs. Police require the ability to immobilise many types of vehicles from mopeds to lorries whilst they are moving or stationary. Solutions, therefore, need to take into account the requirement for the different approaches to tackling these crimes. The following three major priorities were identified:</p> | | |
| Short Description | Description | Area |



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| Effective stopping solutions | <p>A solution that is effective in bringing a vehicle to stop safely every time it is deployed. Ideally, the solution would be 100% effective every time it is deployed, be able to be operated from a distance and stop the vehicle immediately and in a controlled manner.</p> <p>Safe-stop Vehicle Mitigation Technology - Versatile software that offers remote access and control of target vehicle electronics like engine shutdown and brake locking, as well as the vehicle's audio and video functions. The program should be able to slow or stop the target cars swiftly and safely, regardless of the vehicle type.</p> | Technology |
| Improved pre-emptive tactics | <p>The ability to be able to prevent high speed pursuits, preferably by pre-emptive tactics. Practitioners would like technologies which would enhance situational awareness and information gathering, or easily tag, trace and monitor the suspect vehicle from a distance. This solution could be combined with current solutions such as tyre deflation.</p> <p>Risk-Flagging Technology - In order to ensure safety when bringing vehicles to a halt, officers need additional tools to alert nearby motorists and pedestrians of their presence and allow them to evaluate dangers.</p> | Technology |
| Compact and user-friendly solutions for frontline officers | <p>Numerous practitioners stated that they had few specially trained vehicle mitigation officers. For that reason, the development of tools which could be used by mainstream officers was seen as desirable. Tools therefore needed to be compact, simple to operate and the training required to use not onerous.</p> <p>Portable Vehicle Immobilisation Devices - Practitioners want a more compact alternative to present car immobilisation techniques.</p> | Technology |

CRIME SCENE RECORDING & DOCUMENTATION

The scene of a crime is always regarded as the starting point of a criminal investigation; therefore, the effective management of the crime scene is a critical component of the forensic process. Law Enforcement Agencies (LEAs) locate and collect trace materials which can either be examined onsite using 'Real Time Forensics', or at a later stage in a dedicated forensics laboratory.

The crime scene management process adopts a logical approach to ensure that the forensic processes are carried out to maximise the information available. A crucial element of the crime scene examination is to record the crime scene at the earliest possible opportunity. Using all means of recording methods, ranging from hand-drawn sketches to modern 3D image acquisition using airborne drones, an accurate account is made of the scene that was encountered by the first responders who attended. Especially important in this context are the place and condition of material evidence and the relevant visible traces recovered. Secondly, the identified traces and objects need to be preserved and recovered to ensure that the integrity of any evidence collected can be relied upon in any future legal proceedings.

A crime scene is usually only available for a limited amount of time - particularly crime scenes that are situated outdoors, in a public area or in a location where they impede traffic. Factors such as weather, human activity surrounding the scene and the need to restore the environment back to its operational state can also



impact a crime scene. Identifying areas in respect of the use of technology in crime scene investigations could be therefore hugely beneficial in recording and documenting crime scenes.

The general consensus amongst practitioners was that whilst there were a number of technologies available, they were large, expensive and typically weren't principally designed for use at crime scenes. As such, it was suggested that these technologies weren't as effective as they could be had they been specifically designed for use at crime scenes. Also, finding ways of managing and processing the mass volume of data now being collected at crime scenes was seen as a priority of the community. It was agreed that the community would benefit from technological development in the following areas:

| Short Description | Description | Area |
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| Data volume and retention | Large amounts of data can now be collected at crime scenes. This is creating issues with how to store it, process it, access it and retain it. Current data storage capabilities seem to be inadequate. Practitioners would like to see data stored centrally on a network which could be easily accessed and shared. | Technology |
| LEA Storage Capabilities | Due to recent advancements in technology, a huge amount of data can now be collected and recorded at crime scenes. These large volumes of data are creating issues with how to store it, process it, access it and retain it for future use. LEAs current storage capabilities seem inadequate to deal with the vast amount of data that is needing to be stored. Practitioners would like LEA data to be stored centrally on a network and capable of being easily accessed and shared on a shared platform. | Technology |
| Single Entry Point Platform for the Chain of Custody | Practitioners would like to see an integrated, electronic, single entry point platform for the chain of custody. All physical evidence and data would be barcoded and scanned directly at the crime scene, using a tablet, so that all data and evidence had a digital signature. This electronic chain of custody would then be used for the duration of the investigation. Forensic Intelligence Platform - This platform should integrate CS documentation with an electronic chain of custody, allowing for real-time collaboration, data sharing, and information exchange from the crime scene to other expert stakeholders for consultation and decision-making. | Technology |
| 3D Modelling Equipment | The laser scanners currently used at crime scenes are large, expensive and can take a long time to analyse a crime scene. Detailed 3D modelling is often required in complex crime scenes; but, a more basic laser scanner which could produce a rudimentary 3D model much more quickly at the scene would be helpful for less complex scenes. This 3D image could then be transmitted live from the crime scene to other colleagues and LEAs. Ideally, the scanner would be small and cost-effective. The software and scanner should also be easier to use so that all CSIs could be trained to operate it. Crime Scene Quantitative 3D Capture - (focus on laser scanners, photogrammetry and structured lights in application and training). Technologies should improve accuracy and functionality while avoiding scene contamination, with collected data useful for subsequent investigation and judgment. | Technology |



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| Tablet Devices for Use at Crime Scenes | <p>A small, cost-effective and secure tablet device with the following capabilities:</p> <ul style="list-style-type: none"> • Information inputted via speech and converted to text • Capable of live capture and visualisation capture • 360° video live streaming through a secure channel • Ability to transfer data from the crime scene to cloud storage • Able to access information from cloud storage • Ability to share information on a shared platform • Sketch software which can be used with other software on the device • The ability for evidence to be barcoded and scanned using the tablet (the single-entry point system outlined above). | Technology |
| Drones/Robotics | <p>Drones with enhanced functionalities (i.e., sensors) could increase their usefulness at crime scenes. The ability for a drone to locate traces at a crime scene and footprints and fingerprints, for instance, is desirable. Practitioners did consider that the development of robotics which could perform the first assessment of such crime scenes would be desirable.</p> <p>First-Assessment Robots - These robots will be used in place of humans in dangerous and CBRN-contaminated scenes where contamination risks are high.</p> | Technology |
| Training | <p>A lack of training and materials for the new technologies may be contributing to the unwillingness of some CSIs to engage with them. Practitioners would, therefore, like to see more structured training programmes rolled out in their respective LEAs.</p> | Training and Continuous Professional Development |

ONLINE INVESTIGATION

Whilst digital technologies clearly generate new opportunities and benefits for all, conversely, they pose new threats and risks. A widespread use of (new) technologies and techniques for criminal purposes can be seen. Encryption software or end-to-end applications, the provision of Anonymisation techniques and services such as virtual private networks or proxy servers are some examples. These techniques and technologies are constantly improving and, among other things, make it increasingly difficult for law Enforcement Agencies to identify suspects. These technologies can also be used to cause serious impediments to the investigation and subsequent provision of legal and convincing evidence in court. The result of this is that the conviction is much lower or, even worse, no conviction at all. This seriously undermines the rule of law and does little justice to the victims of these serious crimes.

Besides the dark web, (certain) social media/communication platforms and bullet proof hosting services play an important facilitating role in distributing Child Sexual Exploitation (CSE) content, the material can also be easily accessed via all kinds of devices.

The most pressing challenge for those carrying out these investigations is to undertake the necessary adaptations of technologies such as decryption tools and creativity within law enforcement to respond adequately to crimes facilitated by the use of such technologies. The amount of information and data that law enforcement officers must handle and manage daily, and the challenges posed by new and innovative digital technologies is enormous.



Furthermore, in an era of digitisation the need for innovation and cooperation amongst law enforcement is stronger than ever, so to respond adequately to the increasingly sophisticated global threats. Additionally, it is critical for law enforcement be open to new approaches for combating and preventing crime. The increased presence of digital data within the lives of citizens' is also a challenge for law enforcement authorities, as finding a balance between the use of such data to prevent and combat crime and the privacy of the public is one that is faced by the investigator every day. The globalisation and interconnection of mass communication networks, and the speed of connectivity and increased processing and storage capacity of the data provides us all with easier ways of enhanced communication. However, it is these very things that pose challenges and used to disable the safety and security of communities across the world.

| Short Description | Description | Area |
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| Tools for Facial Recognition and Synthetic Image Generation | Law enforcement agencies are interested in both creating synthetic images (for training facial recognition experts and conducting investigations) and identifying them (e.g. detecting a face in a social media account is fake). Violent Content Detection - | Technology |
| Violent Content Detection | LEAs also require automated detection tools for detecting violence in images and videos in order to ensure public safety, so that any violent activity generates an automatic security and police alert. | Technology |
| Natural Language Processing (NLP) | Tools for processing unstructured data and analysing speech and/or text are required by criminal investigators (Entity extraction). | Technology |
| Tools for Virtual Agents | Practitioners require technical solutions that enable the creation of virtual identities in online private channels/groups (e.g., Telegram, Snapchat, Discord, WhatsApp, etc.) and assist investigators in performing tasks such as capturing communications, identifiers, annotating, exporting, and creating reports. | Technology |

PUBLIC ORDER & COUNTER-UNMANNED AIRCRAFT SYSTEMS (C-UAS)

| Short Description | Description | Area |
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| Detection, Identification, Tracking and Neutralisation | Counter-UAS solutions often include one or more of these features. As a result, the technologies demonstrated should cover the entire chain of counter-unmanned aircraft systems, highlighting available counter-drone technical options for law enforcement agencies. Radio Frequency, Radar, Acoustics, Optics, Multi-Sensor Systems, Jamming, Spoofing, Kinetics, and other technologies should be used to get the required results. | Technology |
| Device Neutralisation in Built-up or Congested Areas | The safe neutralisation and retrieval of unmanned aircrafts in congested regions is a significant problem for LEAs. As a result, they need technologies to securely neutralise and secure UAS flying near critical infrastructure, sensitive locations, and other densely populated places. | Technology |



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| Tracking and monitoring of known offenders using Facial Recognition | <p>During the workshop, practitioners stated that facial recognition was not being utilised to its full potential, and that there was a great opportunity to capitalise on this type of technology within public order operations.</p> <p>Practitioners hypothesized that facial recognition could be used to identify people who had previously been identified as offenders, and that it could be useful in identifying individuals who had the potential to cause disorder and incite others to do the same. However, practitioners were aware of the potential risks of using this technology, and that is the possibility to alienate those law-abiding citizens who had no inclination or desire to cause disorder. Therefore, it was stated by the community that any business case or research put forward to facial recognition systems with a public order arena should take into account the social and ethical implications prior to its use.</p> | Technology |
| Tasking and Decision Making with Artificial Intelligence | <p>The use of Artificial Intelligence (AI) within decision making is being used more and more across many business sectors, especially in areas where large amounts of data need to be gathered and analysed. AI can process more data than any person and can make better and faster predictions without the bias and emotions of a human being.</p> <p>Furthermore, via the collected data, AI can identify patterns, and this can be done faster and more accurately than by humans. Therefore, the use of AI in public order scenarios, to analyse the large amounts of data sets in real-time, would be of great benefit. Practitioners would like to use Artificial Intelligence's tasking and decision-making capabilities to allow public order police officers to deploy personnel and equipment to the right place and right time, potentially preventing a hostile situation from occurring. This would require existing systems to be more integrated and feed into one repository rather than buying a new system, that forces could not afford.</p> | Technology |
| Automated Communication System for Public Order Enforcement | <p>Practitioners agreed that there is frequently too much information to consider, assess, and analyse following a large-scale public order operation. The ability to filter out the most important information would be extremely beneficial and time-saving for law enforcement agencies.</p> <p>Presently radio technology and cellular networks provide a suitable means of communication; however, police officers need to have more control over what information is important and what is inconsequential. Having an automated system that distinguishes between the two would be of great value and would also mitigate an overloading of systems. Furthermore, the group added that communication systems are set up to deal with 'normality' and not for major public order incidents. Therefore, to have a system that could 'identify' when large amounts of transmissions occurred and then alter its status to deal with this, would be of great benefit.</p> <p>It was recognised by the group that some of the issues experienced are not all technology-related and could be reduced by adopting an improved and more efficient communications strategy, having</p> | Technology |



better-defined requirements and thinking differently how communications are managed.

There were concerns amongst the group related to the introduction of 5G and the impact this will have on policing. The next generation of mobile internet connectivity will bring new challenges, especially as it will provide a means of faster sharing of information, thus bringing new and interesting challenges to Law Enforcement Agencies. Additionally, the group agreed that 'lessons learnt' post public order events in relation to communications should be shared with colleagues across Europe in order that improvements are made easier and faster.



Innovation - Law Enforcement Agencies' Dialogue



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