

# Drug Hunter

## Bringing Laboratory-Accurate Drug Analysis to the Roadside

Drug Hunter is an award-winning portable drug analyser originally developed at Tallinn University of Technology (TalTech) in collaboration with the Estonian Police and Border Guard Board and forensic partners. Following successful validation and operational deployment, the technology entered the commercialisation phase through TalTech spin-off company SafePAS OÜ, which is responsible for further product development, market deployment, and international scaling of Drug Hunter.

### What Challenge does Drug Hunter address?

The solution addresses one of the growing challenges faced by police authorities across Europe: the rapid and reliable detection of illicit drugs during roadside controls, criminal investigations, correctional settings, workplaces, and other security-sensitive environments.

Current roadside drug testing primarily relies on immunoassay-based screening devices. While useful for initial screening, these tests often detect broad substance classes and their metabolites, leading to false positives and requiring laboratory confirmation. Drug testing is time- and labour-intensive, sample collection is sensitive, and laboratory confirmation often takes place hours, days, or even weeks after the roadside stop, depending on national procedures and laboratory capacity.

Recent assessments by Dutch authorities have shown that approximately 40% of drivers who test positive during roadside pre-screening are ultimately found to have no drug concentration above the legal threshold when laboratory blood analysis is performed.<sup>1</sup> This is particularly common for cannabis (THC), where concentrations can decrease significantly between roadside screening and blood collection. As a result, substantial police, laboratory, and healthcare resources are invested in cases that do not ultimately lead to prosecution.



1 The donor rinses the mouth with a 5 mL saline solution and spits it into the collection cup

2 The sample is inserted into Drug Hunter

3 The comprehensive report includes a detailed list of illegal drugs detected and their concentration levels

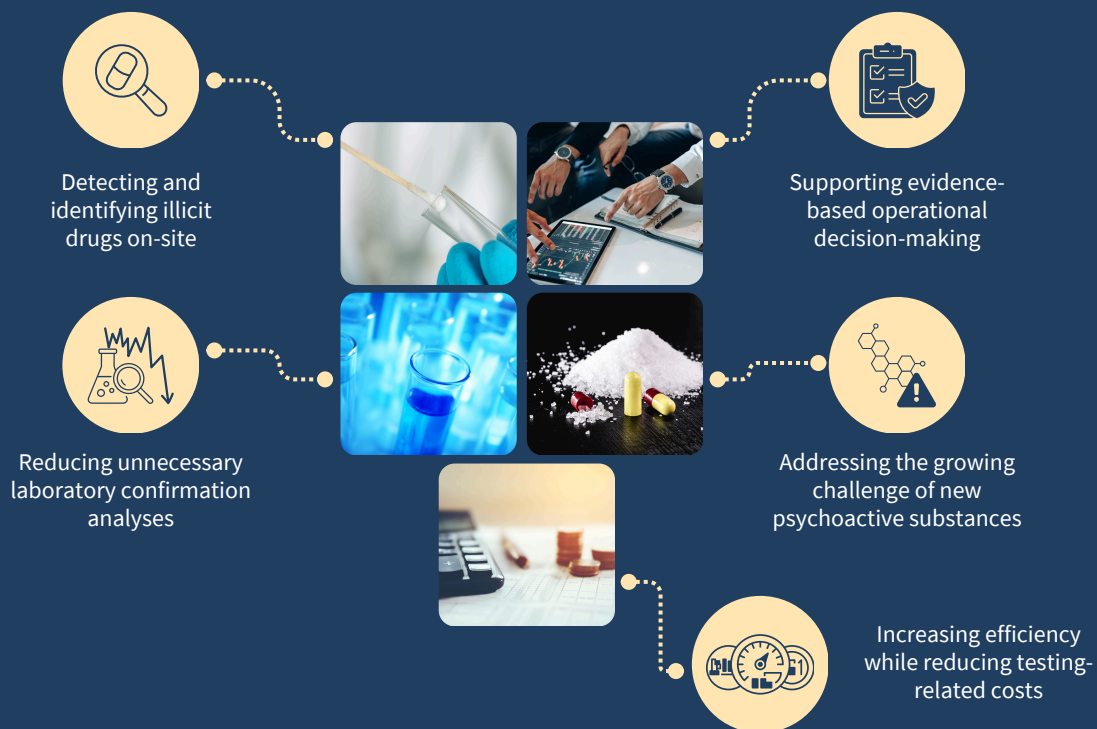
<sup>1</sup> <https://starthubs.co/nl/ministerie-van-justitie-en-veiligheid/rijden-onder-invloed/brief>

Current testing approaches are also relatively expensive and do not always fit the speed and operational realities of roadside enforcement. Law enforcement agencies increasingly need solutions that can rapidly identify signs of intoxication, support operational decision-making at the roadside, and reduce unnecessary blood tests and laboratory workload.

By providing laboratory-accurate quantitative analysis directly from oral fluid at the roadside, Drug Hunter has the potential to reduce unnecessary confirmatory testing, optimise the use of police and laboratory resources, and support faster operational decision-making.

Drug Hunter bridges the gap between screening and laboratory confirmation. Using capillary electrophoresis technology, the analyser identifies and quantifies drugs directly from oral fluid samples within minutes, providing laboratory-accurate results at the point of need.

The technology supports law enforcement agencies by:



## Innovative Aspects of the Solution

Drug Hunter is among the first portable analytical platforms capable of providing quantitative drug analysis outside a laboratory environment.

The technology combines miniaturised capillary electrophoresis, advanced fluorescence detection, and automated data analysis in a compact field-deployable format. Unlike traditional rapid tests that provide only positive or negative results, Drug Hunter measures actual concentration levels of substances, enabling a more informed assessment of recent drug use.

The platform has been validated in accordance with the internationally recognised **ICH M10 Guideline on Bioanalytical Method Validation** in collaboration with forensic laboratories and police authorities, and has already been evaluated in operational environments.

Its modular architecture allows future adaptation to emerging drugs, new psychoactive substances, and evolving security threats, making it a future-ready analytical platform for law enforcement and forensic applications.

 <p>Europol Innovation Award 2023</p>	 <p>Validated with Police and Forensic Partners</p>	 <p>Laboratory- Accurate Roadside Drug Analysis</p>	 <p>Next-Generation Platform in Development</p>
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## Real-World Impact

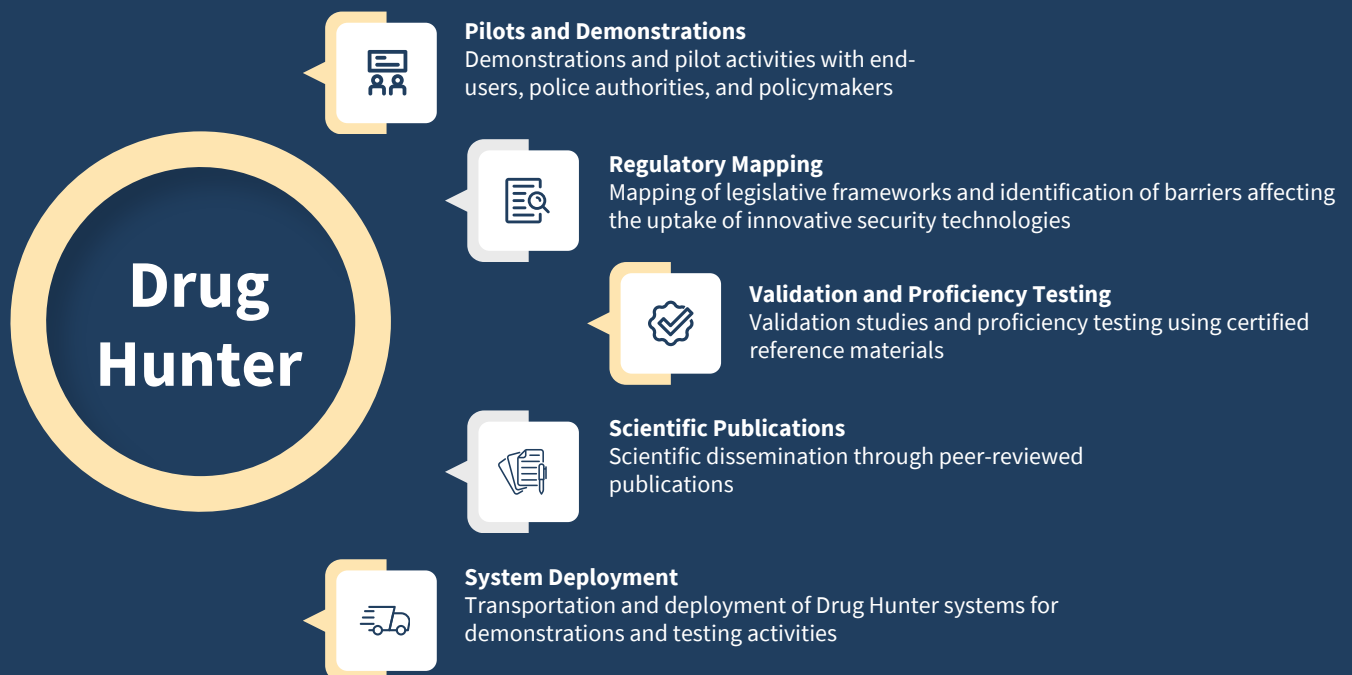
Drug Hunter strengthens roadside drug enforcement by bringing laboratory-accurate quantitative analysis closer to the point of need. By identifying and measuring drugs directly from oral fluid samples within minutes, the system can support faster and more evidence-based operational decision-making. The technology supports law enforcement agencies by helping to detect illicit drugs on-site, reducing unnecessary laboratory confirmation analyses, addressing emerging psychoactive substances, and improving the efficiency of drug testing procedures.

In recognition of its innovation and impact, Drug Hunter received the Europol Innovation Award 2023 in the category Innovative Technical Solution of the Year.



## How ENACT Funding supported Drug Hunter

ENACT funding has played a significant role in accelerating the communication, dissemination, validation, and exploitation activities of Drug Hunter across Europe. The support enabled the Drug Hunter team to participate in major international security and forensic events, including **GPEC Digital (Germany)**, **MILIPOL (France)**, **ENACT Annual Event (Portugal)**, and specialised workshops within the **DETECTION HUB initiative coordinated by KEMEA**.



As a result, Drug Hunter significantly increased its visibility among European law enforcement agencies, forensic experts, policymakers, ministries, and security practitioners. The activities generated new collaboration opportunities, strengthened validation efforts, provided valuable insight into market and regulatory requirements, and supported the pathway toward wider operational deployment across Europe.

By supporting validation activities, stakeholder engagement, and demonstrations across Europe, ENACT funding helped position Drug Hunter as a potential solution to reduce unnecessary confirmatory testing, improve resource efficiency, and support evidence-based decision-making in roadside drug enforcement.



## Future Developments

The next phase of Drug Hunter focuses on expanding pilot deployments with police authorities and forensic organisations across Europe, further validation against emerging psychoactive substances, continued assessment of the legislative landscape, and preparation of the next generation of the platform.

Building on the research and validation work conducted at TalTech, SafePAS OÜ is leading the commercialisation and next-generation development of Drug Hunter. The company is focused on expanding pilots, preparing for large-scale deployment, and further miniaturising the platform to make laboratory-grade drug analysis accessible wherever it is needed.

In parallel, SafePAS is developing a next-generation Drug Hunter platform through funding provided under the **Seal of Excellence grant connected to the EIC Accelerator (RES.5.04.25-0411)** by the **Estonian Business and Innovation Agency (EIS)**. The new platform aims to significantly reduce system size while maintaining laboratory-grade analytical performance and expanding operational deployment possibilities.

The next-generation miniaturised Drug Hunter platform is scheduled to enter pilot deployments in Q1 2027. SafePAS welcomes expressions of interest from police authorities, forensic laboratories, ministries, correctional services, and other security stakeholders wishing to participate in the assessment, validation, and deployment of the technology within their countries. Early adopters will have the opportunity to contribute to the development of next-generation roadside drug testing capabilities and help shape future implementation pathways across Europe.



## Further Information

**Organisation:** SafePAS OÜ; **Solution:** Drug Hunter Analyzer



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Funded by  
the European Union

Through the Cooperation Pillar, ENACT is supporting 12 innovative projects with additional funding to enhance their communication, dissemination and exploitation activities.