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ARTICLE

The European Union project SAFE-CITIES. More effective monitoring of threats in public spaces

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Abstract

Nowadays, human activity is supported by modern technologies and tools. Many of these solutions are used in areas that have so far been resistant to change, as their nature and the applicable regulations did not allow for modifications. Such areas include public spaces which, by virtue of their role, are publicly accessible and open most of the time. In the article, the authors presented the assumptions of the SAFE-CITIES – project aimed at ensuring the highest possible level of protection for public spaces in the face of the growing threat of terrorism – and described selected technologies and tools, created as part of the project, supporting the processes of monitoring threats. They also discussed related projects addressed by the European Union.

Keywords

Safe-Cities, European Union, public space, services responsible for safety, new technologies, threat monitoring

Introduction

Due to the expansion of large cities and urban agglomerations, the difficulties associated with their functioning are multiplying[1]. The basic ones include, among others, problems related to communication, environment, administration, order and maintaining an appropriate level of security, especially in open, publicly accessible facilities or areas. Therefore, an important feature of existing or planned security systems is the ability to detect threats early, enabling the relevant entities to respond quickly to incidents. Due to the number and diverse nature of events that may occur in these spaces, it is impossible to prepare for all of them. The managers of these places should focus on the specific scenarios.

Economic, social and political changes create conditions conducive to the spread of hatred, extremist behaviour and conspiracy theories, which creates the risk of an increase in the number of planned and carried out terrorist attacks. Due to the constant threat of terrorism, the security of public spaces is one of the most important challenges for those responsible for security of contemporary European cities. As the data shows, the number of terrorist attacks in Europe remains high. According to the latest report on terrorist threats in the European Union prepared by Europol, in 2023, in seven Member States (France, Italy, Germany, Spain, Belgium, Greece, Luxembourg), a total of 120 terrorist attacks were recorded, of which 98 were carried out, 9 failed and 13 were foiled[2].

Attack planners are increasingly using the latest technological advances not only for propaganda and recruitment purposes, but also to search for new methods of attack, e.g. using artificial intelligence. The widespread availability of training materials, including on the internet, means that such individuals can easily acquire knowledge about attack tactics, weapons production methods and drone operation. In addition, virtual environments can provide a space for realistic training simulations for terrorists, which can facilitate to prepare for the attacks.

In the face of these challenges, it is extremely important to implement and continuously improve modern technologies that support the process of monitoring and analysing threats to the security of public spaces. Such solutions allow public and non-public entities responsible for security not only to combat threats more effectively, but also to prepare for potential attacks. In response to these needs,

[1] See in more detail, e.g.: A. Kaya, M. Koc, *Over-Agglomeration and Its Effects on Sustainable Development: A Case Study on Istanbul*, "Sustainability" 2019, vol. 11, no. 1. https://doi.org/10.3390/su11010135.

[2] Europol, *European Union Terrorism Situation and Trend Report 2024*, https://www.europol.europa.eu/cms/sites/default/files/documents/TE-SAT%202024.pdf, pp. 5–11 [accessed: 13 III 2025].

numerous actions are being undertaken at various organisational levels. Their aim is to support institutions in ensuring the security of publicly accessible facilities and areas.

When it comes to safety, a variety of strategies and solutions should be used[3]. One of the most important European projects is the SAFE-CITIES[4]. Its implementation will enable more effective surveillance of public spaces. The article aims to present the objectives of this project and to describe selected technologies and tools developed as part of this initiative. The research question was: what kind of security initiatives will the EU undertake that will improve safety in public places? As part of their research, the authors used methods such as analysis, synthesis and inference. For formal and procedural reasons, they were unable to describe in detail some of the project assumptions as well as the technologies and tools developed. Some of them had been passed on for further work aimed at improving their performance and possible commercial use. Moreover, one of the initiatives described is still in progress and the results are not yet known.

SAFE-CITIES project

The SAFE-CITIES project[5] was aimed to ensure the highest possible level of protection for public spaces, primarily in areas such as proper risk management and the use of modern technologies that enable a transition from scattered action to a more comprehensive and systematic security and vulnerability assessment (SVA). As part of the project, the risks in public spaces were thoroughly analysed and strategies were developed to prevent its increase and mitigate the effects of potential terrorist threats. These actions are to be supported by an advanced interactive platform consisting of a variety of interconnected tools. These tools will enable detailed risk analyses to be carried out and will help to identify potential vulnerabilities in the locations under investigation.

The most important assumptions of the SAFE-CITIES project, which was completed on 30 June 2025, was the close cooperation between public and private entities, as well as the involvement of citizens in the process of shaping urban security

[3] J. Przyjemczak, *Wstęp* (Eng. Introduction) in: *Zadanie specjalne – człowiek, technologia, instytucja*, pt. 4, J. Przyjemczak (sci. ed.), Gdynia 2024, p. 7.

[4] European Commission SAFE-CITIES project under Horizon Europe: HORIZON-CL3-2021-FCT-01-07: Enhanced preparedness for attacks in public spaces, https://cordis.europa.eu/project/id/101073945 [accessed: 22 VII 2025].

[5] See: *SAFE-CITIES*, https://safe-cities.eu/ [accessed: 13 III 2025].

strategies, while maintaining their open nature. This was intended to enable more effective threat forecasting, faster response to incidents and better coordination of the activities of the services responsible for security. Another advantage was the opportunity to test innovative methods of minimising the effects of attacks during the project. These methods were to adapt security systems to dynamically changing threats.

SAFE-CITIES project partners

The project was implemented by a consortium consisting of 17 partners from eight EU countries: Italy, Cyprus, the Netherlands, Greece, Poland, Belgium, Finland, Slovenia, and one non-EU country, the United Kingdom. The role of coordinator was held by STAM[6], a private engineering company from Italy specialising in innovative technological solutions in the field of security, including the development of tools to support decision-making based on risk assessment and scenario simulation in crisis situations for critical infrastructure and soft targets[7]. Other partners included:

- technology companies developing analytical and simulation tools: IANUS Technologies (Cyprus)[8], D-Visor (Netherlands)[9], Thridium (United Kingdom)[10];
- research institutes and universities developing methodologies for assessing risk and vulnerability: National Centre for Scientific Research 'Demokritos' (Greece), University of Bologna (Italy), International Institute of Sociology in Gorizia (Italy), Università Verde di Bologna APS in Bologna (Italy);
- entities representing end users and key stakeholders for the effective implementation of solutions, such as: the Ministries of the Interior of Cyprus, Finland, Slovenia, the Provincial Police Headquarters in Gdańsk (Poland), the Red Cross in Gorizia (Italy), the municipality of Nova Gorica (Slovenia), the municipality of Gorizia (Italy), the Confederation of European Security Services (Belgium) and the Polish Platform for Homeland Security (Poland).

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[6] *STAM – Mastering Excellence*, https://www.stamtech.com/ [accessed: 13 III 2025].

[7] Soft targets that may be attacked by terrorists include both physical and human targets that are not covered by special legal protection and are therefore vulnerable to terrorist attacks due to the ease with which they can be carried out. See in more detail: A. Hołub, *Obiekty ataków terrorystycznych* (Eng. Targets of terrorist attacks), "Przegląd Policyjny" 2018, no. 4, p. 18.

[8] *IANUS Technologies*, https://ianus-technologies.com/ [accessed: 13 III 2025].

[9] *D-Visor*, https://www.d-visor.nl/ [accessed: 13 III 2025].

[10] *Thridium*, https://thridium.com/t4s/ [accessed: 13 III 2025].

Thanks to the cooperation of the above-mentioned entities, the initiative took into account the interests of a large group of recipients. This also made it possible to obtain extensive technological, practical and substantive support in the area of the issues addressed.

SAFE-CITIES tools

Innovative solutions based on knowledge and tools provided by partners, tailored to current needs and changing technologies have been developed within SAFE-CITIES[11].

SBS

Scenario Builder & Serious Gaming Simulator (SBS) is an advanced tool for creating and simulating threat scenarios, specifically simulations of mass events and other events taking place in crowded spaces. It allows for realistic representation of dynamic interactions between people and response methods to various threats. With its help, one can create and configure threat scenarios in a realistic 3D environment. The simulator uses, among other things, blueprint objects in conjunction with a timeline, which enables the modelling of complex sequences of events, the customisation of character behaviour and the simulation of security system responses. Based on the data obtained, users can generate and edit three-dimensional spaces by importing CAD, BIM and BFX models, and accurately reproduce real locations. The tool allows for the configuration of both static elements, such as security measures and urban infrastructure, and dynamic elements, including the behaviour of individuals and crowds, security services, as well as strategic places of a given space, e.g. entry and exit points, communication routes and technical nodes. This also allows for the implementation of ready-made scenarios in multiplayer mode, such as realistic training simulations or so-called serious games, where participants can take on different roles. It is an ideal training environment for all entities involved in ensuring public order. The system offers realistic threat simulations covering various complex scenarios, including bomb attacks, arson, knife attacks, shootings, and drone attacks with explosive charges, allowing for comprehensive risk analysis and safety procedures. This is also helpful during virtual reality (VR) sessions, providing an even more immersive experience, increasing the effectiveness of training and allowing safety procedures to be practised in conditions close to real life. As an important training tool, SBS enables more effective security planning as well as faster and more effective response in crisis situations, thereby increasing the level of security in public spaces.

[11] *SAFE-CITIES Architecture*, https://safe-cities.eu/tools/ [accessed: 22 VII 2025].

SERVE

SEcuRity Vulnerability assessment (SERVE) is an interactive tool to assess the risk and vulnerability of public spaces to various threats and the degree of attractiveness of attack targets in any public space. The system's functionality simplifies and streamlines the security analysis as well as offers a comprehensive approach to this process. With SERVE, users can mark the areas under analysis directly on a map or floor plan. The tool also offers the option of selecting threats from a predefined list, thus personalising the risk assessment depending on the specifics of the selected area. It also enables the analysis of various types of risks, such as terrorist attacks, fires or chemical hazards, and thus the precise adaptation of security strategies to specific scenarios or situations. The analysis covers three aspects: risk, impact of risk and the attractiveness of a given public space to attackers. The process is supported by an interactive wizard that guides the user through a set of questions to help determine the level of threat. Each of these three indicators has a separate, customised set of questions. The tool has been equipped with a number of advanced options, such as the ability to import, export and integrate data or modify information such as existing security measures, obstacles, urban infrastructure elements and surveillance systems. SERVE provides a detailed analysis of the vulnerability of an area in the context of specific threats as well as more effective planning and implementation of preventive measures. With its intuitive interface, advanced analysis functions and wide range of applications, the system is an indispensable tool for security experts.

SCoreboard

This is an intelligent analytical tool designed for monitoring and visualising data. Its most important function is to process and present simulation results in real time in a clear and useful way for users. It enables a comprehensive assessment of potential threats and analysis of crisis scenarios. The system visualises key indicators in an intuitive form, enabling quick interpretation of results and support for operational activities. Its easy-to-use interface, provides quick access to simulation results and easy situational analysis in dynamically changing conditions. The implementation of SCoreboard increases the effectiveness of crisis management and improves the coordination of services. The tool supports both the operational planning and threat response phases by providing necessary data for strategic decision-making.

Related projects

The SAFE-CITIES project was modelled on European initiatives funded by the European Commission, focusing on public safety, crisis management and new technologies supporting the protection of urban spaces, in order to build a more resilient, smart and safe urban environment in Europe.

ENLETS

European Network of Law Enforcement Technology Services (ENLETS) is a European network of public order services whose main objective is to monitor security-related technologies, disseminate best practices among European law enforcement agencies and initiate research and development projects in the field of combating crime[12]. The network has been operating since 2008 and brings together representatives from 27 EU Member States, the United Kingdom and Norway. It is supported by national contact points (NCPs), which act as liaisons between individual Member States and ENLETS management groups. An important part of the network's activities are the technology interest groups (TIGs), which bring together experts and practitioners in selected technological areas from various European services. One of the groups focuses on issues related to public order. ENLETS plays an important role in promoting cooperation as well as the exchange of knowledge and experience between European public order services. Cooperation between ENLETS and SAFE-CITIES contributes to a better match between technology and the real needs of public safety services.

PRECRISIS

The project was to develop innovative intelligent solutions in the field of public safety, supporting law enforcement agencies, emergency services, safety managers and other stakeholders[13]. Its main objectives were to strengthen public-private cooperation and integrate modern technologies with best practices in security management. As part of PRECRISIS, tools were developed, tested and implemented to enable more effective security in public spaces. The project was based on expert knowledge, good practices and a privacy-by-design approach, ensuring compliance with data protection and privacy requirements. The SAFE-CITIES and PRECRISIS projects shared a common goal: to increase safety in public spaces through the use of innovative technologies, threat analysis and cooperation between multiple stakeholders. The project was completed on 30 April 2025.

[12] *ENLETS*, https://enlets.eu/ [accessed: 14 III 2025].

[13] *PRECRISIS*, https://precrisis-project.eu/ [accessed: 14 III 2025].

SHRINES

The project focused on increasing the safety and security of places of worship. It was a multidisciplinary network of cooperation bringing together people of many faiths[14]. Its main objectives were to raise awareness of the threats occurring in places of worship and to develop innovative technological solutions and preventive measures serving to protect these places. SHRINE was a network connecting various religious communities, law enforcement agencies and local authorities jointly assessed risk factors, exchanged experiences and identified opportunities for cooperation in the area of protecting religious sites. SAFE-CITIES and SHRINES were based on cooperation between public institutions, social organisations and the technology sector, as well as promoted an innovative approach to risk management and critical infrastructure protection. The project was completed on 31 January 2025.

APPRAISE

The initiative aimed to quickly identify and implement measures that would prevent an attack from being carried out or spreading, or would make it possible to stop it. The main objective was to ensure the security of public spaces without restricting citizens' freedoms by minimising or completely eliminating the threat of attacks. The resulting solutions were to provide capabilities for predicting and identifying criminal and terrorist acts as well as to strengthen operational cooperation between services responsible for security before, during and after an attack. During the project, existing technologies were adapted or new ones were created, and the results of the work were tested in near-real conditions. As part of the tests, numerous study visits and pilot projects were organised to check the correct functioning of individual systems and technologies and to improve them on an ongoing basis. Such tests took place in Ljubljana, Bilbao, Gdańsk and Turin.

The conclusion of this initiative that came to end at the beginning of 2024[15] did not mean the end of work on the solutions developed. This is only the beginning of building a compact and uniform warning and analysis system designed to monitor public spaces and alert the appropriate emergency services when a threat arises, as well as to detect anomalies in human behaviour in order to achieve the highest possible level of situational awareness. The efforts of those involved in the APPRAISE project are being continued as part of other initiatives aimed at improving security[16].

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[14] *SHRINES*, https://shrines-project.eu/ [accessed: 14 III 2025].

[15] *APPRAISE*, https://appraise-h2020.eu/ [accessed: 14 III 2025].

[16] See in more detail: J. Przyjemczak, N. Czyżewska, *APPRAISE project. Building a security system for public spaces*, "Terrorism – Studies, Analiyses, Prevention" 2024, no. 5, pp. 411–421. https://doi.org/10.4467/27204383TER.24.015.19403.

SAFE-CITIES, by focusing on analysing the vulnerability of cities to threats and implementing simulation tools, complemented the activities of APPRAISE and provided additional data and models used to improve the effectiveness of crisis management systems.

Summary

Contemporary cities and urban agglomerations face an increasing number of challenges related to ensuring the safety of public spaces, especially in the face of the growing threat of terrorist attacks. The SAFE-CITIES project was intended to increase resilience to emerging threats and improve the safety of public spaces, including by the use of modern technologies, better coordination of actions and more effective risk management. The systems implemented as part of this project enable the identification of infrastructure weaknesses and the development, based on the data obtained, more effective protection strategies. Thanks to advanced data analysis, they allow for better forecasting of threats and more accurate decision-making. Interactive training and simulations increase the preparedness of services for real incidents and improve their communication and coordination, which speeds up the response to crisis situations.

On 27 March 2025 in Nova Gorica (Slovenia), the solutions developed within the project were demonstrated. For many key security stakeholders, it was a unique opportunity to learn first-hand about technologies aimed at ensuring safety in cities. The participants were able to take part in a special training session based on defined scenarios, aimed at the trying out of the tools and methodologies developed. Such projects contribute to building resilience to threats and provide excellent material for further work in the broadly understood area of security.

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