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Varia

How can local governments protect public spaces from vehicle attacks?

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Since 16 April 2022, alert BRAVO[1], the second level on a four-level scale, has been in force throughout Poland. Alert levels are introduced on the basis of the *Act of 10 June 2016 on anti-terrorist activities* in the event of a threat of a terrorist incident or the occurrence of such an incident. The second alert level is introduced in the event of an increased and predictable threat of a terrorist incident, but where no specific target has been identified[2].

The introduction of the BRAVO alert was a preventive measure. It was caused by the geopolitical situation in the region related to various activities typical of a hybrid attack carried out by the Russian Federation

[1] The BRAVO alert from 6 October 2022 also applies to Polish energy infrastructure located outside of the borders of the Republic of Poland. From 19 November 2025, a third alert level (CHARLIE) was introduced on railway lines managed by PKP PLK and PKP LHS. In addition, a second alert level for cyber threats (BRAVO-CRP) has been introduced, effective as of 1 March 2024. Previously, i.e. from 21 February 2022 to 29 February 2024, the third alert level CHARLIE-CRP was in force, and from 15 February 2022 to 21 February 2022, the first alert level ALFA-CRP was in force.

[2] Article 15(4) of the *Act of 10 June 2016 on anti-terrorist activities*.

and Belarus against Poland and other European Union countries, as well as the consequences of Russia's armed attack on Ukraine. As the Ministry of the Interior and Administration points out, (...) *alert levels are primarily a signal to security services and the entire public administration to remain particularly vigilant*[3].

The legal instrument of introducing alert levels had been used before, but in 2022 both the reasons for and the effects of this measure differed from previous cases. This time, the alert levels were not introduced in connection with the organisation of a specific event, such as state ceremonies, international meetings or elections, but as a consequence of events beyond the control of the Polish authorities and in response to direct intentional actions by other states. The first element of the aforementioned hybrid attack was the migration crisis on the Polish-Belarusian border, which is also the external border of the EU. It was artificially caused by the Belarusian authorities in cooperation with the authorities of the Russian Federation. Over time, hybrid activities began to take other forms, such as testing the resilience of Polish critical infrastructure, setting fire to shops and warehouses or cyber attacks and attacks on railway infrastructure, posing a direct threat to human life and health.

Another significant difference from previous cases of alert levels being declared is their duration. Previously, they were introduced for a short period of time in response to a specific event. This time, they have been in force continuously for over three years, and it is difficult to assess when they will be lifted[4]. As a result, the relevant services, public administration bodies and other entities whose work is affected by alert levels are required to maintain a heightened state of readiness for a long period of time and to implement specific measures in this regard. This is also an opportunity to verify the correctness and adequacy of existing regulations and procedures, as well as a key moment for implementing mechanisms to prevent threats or minimise their effects.

[3] *Stopnie alarmowe BRAVO i BRAVO-CRP na terenie całego kraju wciąż obowiązują* (Eng. BRAVO and BRAVO-CRP alert levels still in force throughout the country), Serwis Rzeczypospolitej Polskiej, 29 VIII 2025, https://www.gov.pl/web/mswia/stopnie-alarmowe-bravo-i-bravocrp-na-terenie-calego-kraju-wciaz-obowiazuja3 [accessed: 11 X 2025].

[4] M. Cichomski, I. Idzikowska-Ślęzak, *Alert levels – practical and legal dimensions of their use*, "Terrorism – Studies, Analyses, Prevention" 2022, no. 2, pp. 245–251. https://doi.org/10.4467/27204383TER.22.025.16345.

Regardless of the reasons for introducing alert levels in Poland, it remains necessary to continuously analyse terrorist attacks that have occurred in other countries, and identify on this basis potential targets for such attacks. This analysis cannot be limited to threats specific to hybrid activities, but should take into account a broader context not only related to regional conditions.

In the current circumstances, it is important to take measures aimed at preventing terrorist incidents or minimising their effects should they occur. Pursuant to Art.3(2) of the Act on anti-terrorist activities: *the minister competent for internal affairs is responsible for preparing to take control of terrorist incidents through planned measures, responding to such incidents when they occur, and restoring the resources used to respond to them*. It should be emphasised that these measures do not have to be implemented directly by the minister responsible for internal affairs. It remains important to initiate them or support other authorities that undertake the responsibility of preparing for threats of a terrorist nature.

The minister responsible for internal affairs chairs the Interministerial Team for Terrorist Threats. The team's tasks include initiating, coordinating and monitoring activities undertaken by the relevant government authorities in the field of preparedness for preventing terrorist incidents, taking control of them through planned measures and responding to them[5]. The role of the chairperson is therefore linked to statutory responsibility for the preparation phase for terrorist incidents, as well as being part of the overall responsibility for security and public order.

One of the methods of terrorist attacks already used in various countries, including the states of the European Union, is the use

[5] See: § 2(2) point 3 of the *Ordinance No. 162 of the Prime Minister of 25 October 2006 on creation of the Interministerial Team for Terrorist Threats*. Current legal status: *Order No. 162 of the Prime Minister of 25 October 2006 on the creation of the Interministerial Team for Terrorist Threats*, amended by Order No. 95 of the Prime Minister of 4 September 2008, Order No. 74 of the Prime Minister of 21 September 2009, Order No. 18 of the Prime Minister of 3 April 2014, Order No. 84 of the Prime Minister of 18 September 2015, Order No. 86 of the Prime Minister of 5 July 2016, Order No. 32 of the Prime Minister of 27 April 2017, Order No. 160 of the Prime Minister of 9 November 2017, Order No. 92 of the Prime Minister of 7 June 2018 and Order No. 37 of the Prime Minister of 8 April 2021. Cf. M. Cichomski, I. Idzikowska-Ślęzak, *Strategic level of the Polish anti-terrorist system – 15 years of the Interministerial Team for Terrorist Threats*, "Terrorism – Studies, Analyses, Prevention" 2022, no. 1, pp. 297–319. DOI: 10.4467/27204383TER.22.011.15427.

of a ramming vehicle. The use of a vehicle to attack people in urban spaces is one of the most serious threats in urban spaces, if only because of the high availability of this tool. Preventing such incidents is not solely the responsibility of services. In the case of open and mass events organised in public spaces, responsible for their security, especially in terms of infrastructure, which can be used to increase the security level of a given undertaking, is primarily the responsibility of local authorities.

Therefore, a document entitled: *Protecting public spaces from vehicle attacks – recommendations for local authorities* was prepared on the initiative of the Minister of the Interior and Administration. It was developed by police experts in cooperation with the Ministry of the Interior and Administration as well as the Internal Security Agency, drawing on the experiences of other states. Recommendations are intended to be helpful both in planning investments aimed at ensuring the security of public spaces, e.g. automatic anti-terrorist barriers or other fixed structures, and in the improvement of technical and architectural solutions already in use. The document was prepared in September 2025 and forwarded to provincial city mayors and provincial governors for further distribution to local authorities.

As indicated in the recommendations many technical and architectural solutions are currently available on the market, ranging from parking bollards and obstacles in the form of street furniture elements to certified road barrier systems that can minimise or even eliminate the risks associated with the use of a ramming vehicle. The effectiveness of these measures usually increases with the cost of their purchase and maintenance. Therefore, decisions in these matters must serve to ensure the highest possible level of protection within the available resources, including the effective use of law enforcement services, and must be adequate to the threats.

Recommendations include, among other things, the characteristics of threats involving the use of ramming vehicle, a description of the process of planning security measures for various public spaces, infrastructural and architectural protective measures, as well as possible forms of integrating security measures into urban architecture or the possibility of using temporary security measures and other existing architectural elements as barriers. The document also describes the role of local law enforcement services (municipal and communal guards)

as well as formal safety requirements for contractors and employees performing activities related to anti-terrorist barrier access control systems or their integration.

It is worth noting that recommendations include various types of public spaces that may become targets for vehicle-borne terrorist attacks, such as marketplaces and town squares, pedestrian zones and promenades, venues for mass events, as well as public spaces of a universal nature.

The document is not normative in nature, and therefore its use will depend on the willingness and capabilities of local authorities. The guidelines contained therein can be adapted to local conditions[6].

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[6] We publish the document on the following pages as an attachement to the text (editor's note).

Protecting public spaces from vehicle attacks – recommendations for local governments[1]

Introduction

The threat posed by attacks using vehicles, so-called vehicle-ramming attacks to run people over, is currently one of the reasons for the growing number of incidents of a terrorist nature. Attacks of this kind have been carried out in Europe and around the world for many years, and recently there has been an increase in their frequency and in the number of fatalities. An example is the incident that took place in Nice in July 2016 during the celebrations of the national holiday of France, when a truck driven by an attacker rammed through barriers and drove into people on the promenade, killing 87 people and injuring another 434. Similar attacks were carried out in other major cities in Europe and America, including in Berlin, Barcelona, London, Stockholm, New York, Toronto. Poland is a safe country, but terrorist incidents are also possible in our country, which is why it is necessary to take preventive measures or measures to minimise the effects of possible attacks.

It should be noted that a vehicle-ramming attack is a relatively easily accessible tool. Even an ordinary passenger vehicle can cause numerous casualties and trigger mass panic. On the other hand, this type of threat has led to the development of numerous architectural and technical solutions. These include various types of security measures, ranging from simple parking posts considered to be order maintenance measures, through small architecture obstacles capable of stopping vehicles, to certified road barrier systems offering the highest level of security. Due to the variety of available solutions, choosing the right one is not a simple matter. On the one hand, it depends on the type of facilities or the layout of the space that would be protected, and on the other hand, it often depends on the size of the budget allocated for this purpose.

[1] The Polish version is the original version of the document. Only changes to the graphic layout of the table were made. Translation provided by the editorial team (editor's note).

In summary, the use of a vehicle as a means of carrying out a terrorist attack is becoming a phenomenon that is part of the current picture of urban threats, if only because of the relatively simple mechanism of action of their perpetrators. The openness and accessibility of urban spaces make it impossible to completely eliminate the risk of vehicle attacks, but proper infrastructure planning can significantly hinder their execution and minimise their impact. In particular, this refers to infrastructure that can be used in such situations to increase the security level of a given public project, as well as being appropriately integrated into the resources of law enforcement services, including, for example, municipal guards.

These recommendations have been developed by the Police, in cooperation with the Ministry of the Interior and Administration and the Internal Security Agency, with concern for the safety of Polish cities and towns, and are intended to serve as a practical guide based on expert experience and international best practices (including those from the United Kingdom, Germany and the Netherlands). They are based on proven solutions used in other countries and specialist knowledge, without referring to detailed local risk analyses. The aim of this study is to present universal principles that every municipality, regardless of its size and budget, will be able to adapt to its own conditions in order to prevent or mitigate the effects of a vehicle attack.

The purpose of addressing this document to city and municipality authorities is that its contents will prove useful in making often difficult decisions regarding ways to protect public spaces, both in terms of future investment processes and in the context of developing existing resources.

Scope and application of recommendations

Recommendations include various types of **public spaces** that could become targets for attacks using speeding vehicles. This applies in particular to:

- **market squares and town squares** – central gathering places (e.g. market square, squares in front of town halls), often used for fairs, gatherings or special events,
- **pedestrian zones and areas** – streets closed to traffic, where pedestrians gather every day (shopping streets, promenades),

- **places of mass events** – areas where concerts, festivals, sporting events, etc. take place, both permanent (stadiums, esplanades) and temporarily arranged (e.g. streets closed for the duration of a street race),
- **public spaces of a universal nature** – e.g. parks, squares, boulevards, recreational and tourist areas, which are open by nature and can accommodate large groups of people.

For each of the above categories of space, typical **threats and challenges** as well as **appropriate countermeasures** have been identified. The document focuses on **infrastructural and architectural protective solutions** – such as physical barriers (fixed and automatic), posts, guardrails or specially designed elements of street furniture that serve a protective function. Furthermore, **methods of temporarily securing** spaces during periods of increased risk (e.g. during mass events) using portable barriers and other available means were discussed. Recommendations also define **the tasks of local security services** (municipal/communal guards) in supporting these security measures and address **legal and organisational aspects** necessary for the effective implementation of measures (division of responsibilities, cooperation with private entities, compliance with regulations).

Note: Recommendations should be treated as a starting point – they should be adapted to local conditions (urban layout, scale of risk, available financial resources). Where possible, a range of solutions has been indicated, from simple and low-cost to advanced and more costly, in order to facilitate their implementation in different municipalities.

Characteristics of a vehicle attack

Before we move on to solutions, it is worth understanding the specific nature of the threat:

- **Element of surprise:** A vehicle attack can occur **suddenly and without warning**, anywhere where there is a crowd. The perpetrator may use a passenger car, van or lorry – including a rented or stolen vehicle – which makes it difficult to detect their intentions in advance[2].

[2] https://www.rand.org/randeurope/research/projects/2022/preventing-and-mitigating-terrorism-attacks-using-vehicles.html#:~:text=The%20frequency%20of%20vehicle,such%20attacks%20in%20the%20future

- **High destructive power:** A vehicle travelling at high speed (even a medium-sized one) can cause serious casualties. A lorry weighing several tonnes travelling at high speed can ram obstacles and victims over a distance of several dozen metres[3].
- **Multiple potential targets:** There are many places where people gather, from shopping streets to outdoor events. It is impossible to secure literally every place at all times, so efforts are focused on **the most vulnerable locations** (city centres, pedestrian zones, public facilities) and **events that attract large crowds**.
- **Technical measures limitations:** Available security measures can **hinder or prevent** an attack, but they do not guarantee complete protection. Even solid barriers have their limits, and an attacker may find a vulnerability (e.g. an unsecured entrance). During crash tests, one of the parameters taken into account when checking the effectiveness of a security measure is the so-called penetration, which determines how far beyond the barrier line a vehicle can travel. Once this parameter is known, it must be taken into account when designing the distance between the barrier and the protected objects or pedestrian and vehicle routes. That is why it is important to have **a well-thought-out plan for the placement** of barriers – decisions on where to place them leave no room for error[4].
- **Psychological impact:** The presence of security measures affects the sense of safety of residents and visitors. Efforts should be made **to mitigate the 'bunker syndrome'**, i.e. avoid transforming the city into a visible fortress, which could cause anxiety. The solutions should be **discreetly integrated** into the urban space so that people can feel at ease, without even realising that they are being protected. As experts emphasise, **maintaining the open character of the city** is important – we do not want fear to dictate the appearance of our streets.

When determining the types of risk for a specific location, both the threat and the potential consequences of an incident should be taken

[3] https://www.dw.com/en/do-bollards-offer-protection-against-vehicle-attacks/a-43300057#:~:text=The%20barriers%20most%20commonly%20used,80%20meters%20behind%20the%20barrier

[4] https://www.dw.com/en/do-bollards-offer-protection-against-vehicle-attacks/a-43300057#:~:text=helped%20prevent%20Saturday%27s%20attack%20because,among%20those%20to%20be%20protected

into account, as well as the vulnerability of the location to an attack using a vehicle as a means of carrying it out[5].

Knowing these conditions, local governments can approach the problem realistically: **risk reduction instead of total elimination**. The aim is to transform and manage public spaces in such a way that a potential attacker encounters **physical barriers that delay or prevent** them from achieving their goal, and that the services have a chance to react before the greatest damage is done. Below are specific recommendations on how to achieve this.

Planning security measures in various public spaces

The nature and layout of a space influence the choice of security measures. Below are descriptions of key types of locations and recommended approaches to securing them against the entry of dangerous vehicles:

- **Markets and town squares:** Open squares are often surrounded by streets from which vehicles can potentially enter. **Fixed barriers around the perimeter of the square** (e.g. rows of posts, low walls, heavy planters) form the first line of defence, protecting people in the centre. Attention should be paid to securing the main **entrances to the square** – it is worth installing **fixed or automatic barriers** there to prevent unauthorised vehicles from entering. If the square is occasionally used as a car park or delivery point, **retractable bollards** can be used, which are opened to allow authorised vehicles to pass. When planning new squares, it is recommended to **design access roads with safety in mind** – e.g. using curves, narrowings or changes in surface levels to prevent vehicles from gaining high speed in front of the square. When organising mass events in the square, it is advisable to add **additional temporary barriers** for the duration of the event (details later in this document).
- **Pedestrian zones and areas:** Permanent pedestrian zones (streets closed to traffic) require security measures mainly **at the beginning and end of the zone** – where the pedestrian area normally begins. It is standard practice to install **fixed**

[5] https://www.abw.gov.pl/ftp/foto/Wydawnictwo/terroryzm/nr3/10_-_artykul_-_J__Jazwinski.pdf, p. 369.

bollards or **automatic barriers** at the entrances to streets leading to the pedestrian zone so that no vehicle can enter without permission. Many European cities (i.e. in France) use a combination of **fixed and retractable bollards** – fixed bollards block entry most of the time, while automatic bollards can be lowered for emergency vehicles or deliveries at specific times[6]. It is important to maintain **continuity of safety measures** – e.g. if a pedestrian zone crosses a street where traffic is not completely closed, consider **shielding the pedestrian route with barriers or solid elements of street furniture** at the intersection. An additional solution to improve safety is to **'naturally' slow down traffic** around the pedestrian zone: traffic islands dividing lanes, chicanes or raised crossings, which force drivers to drive slowly and make it difficult to suddenly steer a vehicle into a crowd.

- **Areas of mass events:** in the case of events attracting large crowds (concerts, street festivals, seasonal fairs) organised in open spaces, **temporary security measures around the perimeter of the event are particularly important**. All possible routes that a vehicle could use to enter the area should be identified and blocked in advance. **Access roads should be closed** at a sufficient distance from the crowd so that a speeding vehicle would not be able to reach it. In practice, a combination of measures is used: **heavy physical barriers (concrete or steel)** placed across streets, **special mobile anti-terrorist barriers** (modules placed on the road) or **service vehicles as blockades**. For instance, in Germany, following the attack on the Christmas market in Berlin, routine security measures were introduced for large events – during festivals in Stuttgart and other cities, multi-tonne lorries were placed on access roads, creating a barrier against any potential attack[7]. Efforts should also be made to ensure that service vehicles used as roadblocks have sufficient weight to serve as effective security measures (a vehicle weighing 1.5 or even 3.5 tonnes may not constitute an effective barrier, so,

[6] Ibid.

[7] https://www.dw.com/pl/niemieckie-miasta-reaguj%C4%85-na-zamach-w-barcelonie/a-40160693#:~:text=W%20STUTTGARCIE%20i%20innych%20miastach,kampanii%20wyborczej%20oraz%20na%20festynach

where possible, security measures should be implemented using heavy goods vehicles weighing over 12 tonnes, treated, of course, only as a temporary measure). Organisers should cooperate with the Police and local government to ensure that **the event security plan (required by the Act on the safety of mass events) takes into account the scenario of an attack using a vehicle**, including procedures for the rapid closure of roads and readiness to use available barriers.

- **Universal public spaces (parks, boulevards, etc.):** in open spaces, it is difficult to install physical barriers around the entire perimeter, but it is worth assessing **where a vehicle could potentially enter at high speed** (e.g. a long straight section of an alley leading into a park, a boulevard along a river with technical access). In such critical areas, it is recommended to **install obstacles in specific locations:** e.g. narrowing the entrance to the park with posts or decorative boulders, setting up **roadblock restricting entry** (barriers, guardrails) on side access roads used only by services. **Street furniture** can play a role here – benches, planters and bicycle racks placed in a row can prevent vehicles from speeding along the park path. It is important to strike a balance between accessibility for residents (e.g. not closing park entrances unnecessarily) and security – often, **simply making entry more difficult and introducing an element of surprise** is enough to deter potential perpetrators.

Regardless of the type of space, a **layered approach** is key: the more successive barriers and obstacles a vehicle encounters, the greater the chance of stopping or slowing it down, giving people time to escape and emergency services time to respond. Specific engineering and organisational solutions that can be implemented are described below.

Before installing anti-terrorist barriers, it is necessary to conduct an appropriate risk analysis and reconnaissance, taking into account the terrain and urban layout of the areas where such an investment is planned. It should be noted that the terrain itself or the layout of streets in urban agglomerations (e.g. winding, narrow roads preventing vehicles from accelerating) may determine that there is no need to install such barriers, or may indicate an increased likelihood of an effective terrorist attack using a vehicle ram in a given location (e.g. a wide pedestrian zone located near the city's main transport

routes, a square located near a slope allowing vehicles to quickly pick up speed, etc.).

Infrastructural and architectural protective solutions

This section presents the available **technical solutions** for protecting public spaces against vehicle intrusion. These include both **fixed infrastructure elements** that become part of the urban landscape, as well as **automatic devices** and **mobile equipment**. It is important to understand the capabilities and limitations of each measure in order to select the combination that best suits local needs. The table below summarises the basic types of barriers and their characteristics, while the following description presents their role and examples of their use.

Table 1. Overview of types of antiterrorist barriers and their characteristics.

Fixed posts and barriers (steel, concrete)			
Approximate cost	**Effectiveness**	**Installation requirements**	**Example applications/ comments**
Medium (one-time installation)	**High against passenger cars**; when using certified posts – also against heavier vehicles at moderate speeds. Certified models can even stop trucks (7.5 t at ~80 kph). They are also effective as everyday access control.	They require earthworks (foundations) and a design that fits into the space. After installation – minimal maintenance costs.	Fixed fencing of pedestrian zones, surrounding squares, protecting pavements from vehicles. Aesthetically, it can be adapted (e.g. stylised posts). They hinder access for emergency services if there are no gaps or removable elements[8].

[8] https://www.dw.com/en/do-bollards-offer-protection-against-vehicle-attacks/a-43300057#:~:text=The%20highest%20security,worth%20their%20often%20enormous%20cost

Automatic retractable barriers (retractable bollards, hydraulic barriers)			
Approximate cost	**Effectiveness**	**Installation requirements**	**Example applications/ comments**
High (purchase and infrastructure)	**Very high** (certified models can even stop trucks ~7.5 t at ~80 kph). They are also effective as everyday access control.	They require a power supply and control system, as well as solid installation (although shallow mounting systems are available). Technical servicing is necessary.	Entrances to restricted areas (old towns, important facilities). They allow authorised vehicles (e.g. public transport, supplies at designated times) to enter. In the event of a breakdown, they must have an emergency exit procedure[9].
Massive elements of small architecture (conrete flowerpots, blocking benches, low walls)			
Approximate cost	**Effectiveness**	**Installation requirements**	**Example applications/ comments**
Low to medium (often part of the space design)	**Average** – well-designed ones can stop or deflect lighter vehicles; **limited effectiveness against lorries** (which can push them aside or ram them). Certified models can even stop trucks (7.5 t at ~80 kph). They are also effective as everyday access control.	Installation as part of site arrangement (flower pots/benches may need to be anchored to the ground for stability). Maintenance is required as with ordinary street furniture.	They can serve a dual purpose: aesthetic and protective. Used in old towns, on public buildings (e.g. rows of reinforced concrete planters in front of the office can stop a heavy vehicle). They should be **arranged so as not to leave wide gaps**. It is worth combining them into groups or with additional steel elements to enhance the effect.
Temporary road barriers (partitions, concrete road barriers of a Jersey type)			
Approximate cost	**Effectiveness**	**Installation requirements**	**Example applications/ comments**
Low (often already owned by road services or easy to hire)	**Low to medium** – standard lightweight metal barriers do not constitute an obstacle for vehicles (only a visual signal).	Easy to use – simply place it in a desired location. Concrete blocks require transport equipment (crane, forklift).	Temporary closure of streets for the duration of the event, designation of a safety zone.

[9] Ibid.

Temporary road barriers (partitions, concrete road barriers of a Jersey type)			
Approximate cost	**Effectiveness**	**Installation requirements**	**Example applications/ comments**
	Heavy concrete blocks **slow down and hinder** entry, but **will not stop a speeding truck** (DEKRA tests: a truck travelling at 50 kph smashed through concrete blocks, only coming to a halt 80 m further on).	The arrangement should allow for a pedestrian crossing.	It is recommended to **connect the blocks in a row** (e.g. with steel cable or modular connectors), which increases their effectiveness. Lightweight barriers should only be used as an auxiliary measure (to fence off an area or regulate traffic), never as the main vehicle barrier[10]. They are a supplement to antivehicle barriers. Their use – for example in the form of chicanes – can effectively reduce the speed of an approaching vehicle. Therefore, it is possible to use certified barriers with lower impact resistance, as lower vehicle speed and weight mean lower forces acting during a collision. This may also reduce the costs of installing certified barriers, while maintaining their effectiveness in appropriately prepared conditions.
Mobile anti-terrorist barriers (blocking modules)			
Approximate cost	**Effectiveness**	**Installation requirements**	**Example applications/ comments**
Medium (cost of purchasing or renting a set)	**High** – certified steel modules can stop a speeding vehicle	They require little time to set up by trained personnel.	The best **temporary** protection in case of increased risk or events.

[10] https://www.dw.com/en/do-bollards-offer-protection-against-vehicle-attacks/a--43300057#:~:text=The%20barriers%20most%20commonly%20used,80%20meters%20behind%20the%20barrier

Mobile anti-terrorist barriers (blocking modules)			
Approximate cost	**Effectiveness**	**Installation requirements**	**Example applications/ comments**
	(available designs tested on lorries). Effectiveness depends on the model and configuration of the modules.	They do not need fixed installation – they are placed on the surface, often wedged in place by their own weight and friction. Storage space, transport to the site and assistance with unfolding are required.	Modules allow pedestrians and cyclists to move freely while protecting the area from vehicles ramming into it. They are easy to remove after the event. Recommended for protecting procession routes, public gatherings, VIP visits, etc. – wherever there are no fixed barriers and the risk is temporarily increased.
The use of vehicles as roadblocks (e.g. trucks, city buses)			
Approximate cost	**Effectiveness**	**Installation requirements**	**Example applications/ comments**
Low (use of own resources, fuel and possible overtime for drivers)	**High for passenger cars and medium for lorries** – properly positioned heavy vehicle (sand spreader, bus) is a very difficult barrier to overcome. However, **it is not anchored**, so a speeding lorry can move it or partially push it aside. Service vehicles used as roadblocks should have sufficient weight to serve as effective barriers. A car weighing 1.5 or even 3.5 t may not be an effective barrier, so where possible, barriers should be created using heavy goods vehicles weighing over 12 t. They should be treated only as temporary measures.	This requires the availability of heavy vehicles and drivers, as well as coordination with the services (e.g. the Police). Vehicles should be positioned at the correct angle (preferably sideways to the direction of a potential attack) and secured (brakes, wheel chocks).	A makeshift method used, for example, by German cities to secure mass events. Good as **a last line of defence** or emergency measure – e.g. placing vehicles at the end of a pedestrian zone during a large Christmas market. Barricade vehicles require constant readiness to be moved if necessary (e.g. to let an ambulance through), so they should be parked with the driver nearby or with the possibility of quick departure.

Approximate cost: "low" – low-cost or existing solution (to be used within current resources), "medium" – moderate purchase/installation cost, "high" – significant investment and maintenance cost.

Effectiveness: relative assessment against attacks – the actual ability to stop a vehicle depends on the weight and speed of the vehicle and the specifications of the barrier.

Installation requirements: key technical, logistical or formal requirements for implementing a given measure.

Commentary to the above solutions: It should be emphasised that the **advantage of the best systems** (certified barriers) is their **predictable effectiveness** – they have undergone standardised crash tests (e.g. in accordance with PAS 68, IWA 14-1 or ASTM F2656, DOS (K4, K8, K12) or ISO 22343 standards), which means that it is known what mass and speed the vehicles are capable of stopping. In practice, however, local governments often have to resort to makeshift or lower-standard solutions (for budgetary or aesthetic reasons). Even these can **reduce the risk**: the presence of even partial barriers may discourage the perpetrator, who will assess their chances of success as lower[11]. However, one should be aware of the limitations – e.g. **ordinary road barriers or loosely placed concrete blocks will not stop a speeding lorry**[12]. Therefore, whenever possible, **choose proven and certified solutions** or those that increase the effectiveness of simple measures (e.g. by connecting blocks in a row, using double rows of barriers, utilising the natural terrain such as kerbs, trees, lampposts, etc. as additional obstacles).

Integrating security measures into urban architecture

In order to secure public spaces, it is worth using **"Security by design"** approach, i.e. incorporating protective elements into urban and architectural design. This allows the city to be safe **without**

[11] https://www.abw.gov.pl/ftp/foto/Wydawnictwo/terroryzm/nr3/10_-_artykul_-_J__Jazwinski.pdf, p. 372.

[12] https://www.dw.com/en/do-bollards-offer-protection-against-vehicle-attacks/a43300057#:~:text=The%20barriers%20most%20commonly%20used,80%20meters%20behind%20the%20barrie%20r

compromising its charm and functionality. Here are some good practices for such integration:

- **Decorative elements with a protective function:** Many physical barriers can be turned into visually appealing installations. The example is Emirates Stadium in London, where **big concrete letters forming the word "ARSENAL" serve as a vehicle barrier** protecting the entrance to the building. Similarly, **concrete benches and sculptures** can block access roads while looking like part of the street furniture. Such 'ram-proof landscape features' have been successfully used around government buildings in London (e.g. discreetly built-in barriers on Whitehall street).
- **Flowerbeds and urban greenery: Massive planters** arranged in rows are a popular way to block a vehicle's potential path. They are aesthetically pleasing and, when properly constructed (made of reinforced concrete or steel and filled with soil), they form a solid obstacle. Experts point out that **even innocent-looking flowerbeds can stop a lorry if they have an anti-ramming structure inside**. Such flower pots are used, for example, in France in front of government buildings and in the United Kingdom at shopping centres. These types of products, i.e. flowerbeds and planters can also be certified.
- **Designing streets with safety in mind:** Landscape architects recommend that the **layout of communication routes should not allow vehicles to accelerate for long distances in a straight line towards crowds**. This can be achieved through **bends, roundabouts, chicanes, narrowings** – anything that forces a potential vehicle to slow down or manoeuvre. For example, a pedestrian zone can be designed with a slight meander instead of a perfectly straight line, and a town square can have a **buffer zone** around it with trees, lampposts and benches positioned to make it difficult for a vehicle to gain speed.
- **Resistance standards and certifications:** If possible, **use products that have been certified** as effective in stopping vehicles. International standards have been adopted, such as the British **PAS 68** or international **IWA 14-1**, ISO 22343, classifying barriers according to the weight and speed of the vehicle they can stop. In practice, this means, for example, that a certified post can withstand the impact of a 7.5 t lorry travelling at 50 kph, while an uncertified element of similar appearance can be broken by

a passenger car. **Ordinary road barriers should not be confused with anti-terrorist barriers** – the former are designed to limit the effects of accidents, not deliberate attacks[13]. Therefore, for example, **grey concrete road separators** used on roads (so-called "New Jersey") do not guarantee that a lorry will be stopped and should only be treated as an auxiliary measure.

- **Avoiding installation errors:** Even the best barrier will not work if it is poorly installed. **Unanchored, poorly chosen barriers can be moved by a vehicle**, causing more damage – a barricade pushed by a lorry can fall into a crowd instead of protecting it[14]. Therefore, when planning the installation, attention should be paid to the **technical requirements for assembly** (whether a given element should be fixed to the ground, how deep the foundation needs to be, and how far away from the protected object it should be placed). If concrete blocks are used temporarily, try to **connect them to each other** or to other structures (e.g. place them behind a lamppost or tree) to increase their resistance. In turn, when opting for automatic bollards, make sure that they have an **emergency power supply system** or can be lowered manually in the event of a power failure, so that emergency services do not get stuck in front of their own barriers in a critical situation.

Temporary safeguards and use of existing barriers

Local government units often face the challenge of securing one-off or recurring events (e.g. annual festivals, street marathons) without having a permanent, extensive anti-terrorist infrastructure in place. In such situations, it is crucial to **make effective use of the temporary measures available**. Recommendations in this regard are described below.

- **Road barriers in a new role:** typical barriers used in traffic management (steel spans, bollards, road barriers) **will not stop an attack on their own**, but they can be used as an auxiliary

[13] https://www.abw.gov.pl/ftp/foto/Wydawnictwo/terroryzm/nr3/10_-_artykul_-_J__Jazwinski.pdf, p. 362.

[14] https://www.abw.gov.pl/ftp/foto/Wydawnictwo/terroryzm/nr3/10_-_artykul_-_J__Jazwinski.pdf, p. 367.

measure. For example, **a series of road barriers** can be used to create an obstacle course, forcing a vehicle to slalom and preventing it from accelerating straight into a crowd. Metal barriers can also be used to separate pedestrian areas from the road, maintaining distance. **However, on their own, they only provide partial protection**. If concrete segments are available (e.g. from road repairs), they can be placed behind such a line of barriers as physical reinforcement. **Water and sand** – filling containers – this will improve the weight of the barrier, but its effectiveness will still be limited with larger vehicles[15].

- **Renting or sharing mobile barriers:** More and more companies are offering mobile **anti-terrorist barriers for hire**. Local governments in the region may consider **jointly purchasing** such equipment for use in securing various events. Alternatively, it is worth establishing cooperation with private companies that own such barriers (e.g. by renting them for large municipal events). It is important to practise assembly in advance – ensure that employees or municipal guards are trained in the quick assembly and disassembly of modules. Mobile barriers should be **strategically placed**: for instance, instead of placing a single row of barriers directly in front of the concert stage, it is better to place two rows several metres apart on the access roads to the venue (creating a buffer zone). We should also remember that **techniques can be combined** – mobile barriers can be supplemented with service vehicles, warning tapes and even natural elements of the environment (e.g. blocking the entrance between buildings with a heavy rubbish container or concrete municipal bins).
- **Use of municipal and service vehicles:** According to the data presented in the table, the use of heavy vehicles as blockades is a proven temporary measure. **The crisis management plan for a mass event** should specify where such vehicles can be obtained if necessary – whether from the municipal fleet (rubbish trucks, sand spreaders, buses) or from partners (construction companies, public transport). It is worth **establishing a procedure**: who

[15] https://www.dw.com/en/do-bollards-offer-protection-against-vehicle-attacks/a43300057#:~:text=The%20barriers%20most%20commonly%20used,80%20meters%20behind%20the%20barrie%20r

decides on the provision of vehicles, where exactly they should be stationed, who is in charge. It is good practice to keep vehicles on standby on the outskirts of the event. For example, during the Christmas market, two street spreaders can be placed around the corner, ready to block the main entrance when signalled. It is important to ensure that **priority signals are visible** – a vehicle used as a barrier should have its warning lights (flashing lights) so that it is clearly visible and unambiguously associated with the activities of the services, which prevents panic and facilitates communication (people and drivers should see that the blockade is intentional and not, for example, the result of an accident).

- **Temporary infrastructure modifications:** If a given location is regularly used for events (e.g. a town square for a New Year's Eve concert every year), **permanent mounting points** for temporary barriers may be considered. These could be, for example, **anchors in the pavement** covered with decorative caps on a daily basis, into which additional posts/barriers can be inserted if necessary. Another idea is to have **chain barrier segments** that fit fixed elements – for example, if the square is surrounded by fixed posts, you can have chains or beams that can be quickly attached between them to create a continuous barrier. These are simple solutions, but they can save valuable time when securing the area.

In summary, in special situations, **one should make creative use of what is available to a given local government**. Even a makeshift barrier can save lives if used wisely. However, whenever only temporary measures are planned, it is essential to have a **plan B** – what to do if they fail. This is why the role of security services during secured events is so important, as discussed below.

The role of local security services (municipal/communal police)

The municipal or communal police, as a formation subordinate to local government, plays an important role in supporting architectural and organisational security measures against terrorist threats. Its tasks and competences in this context include:

- **Supervision of public spaces:** City guards patrolling the streets can **monitor the condition of security measures** – check whether

fixed barriers have been damaged or deliberately removed, ensure that automatic bollards are not left down unnecessarily, and check for unauthorised vehicle traffic in protected areas. They are the 'eyes and ears' of the local government in the field, so their observations can quickly identify potential weak points (e.g. an open roadblock, a broken barrier mechanism, a detour that allows entry from another side).

- **Enforcement of traffic restrictions:** Most architectural solutions work in conjunction with regulations – e.g. no-entry signs in vehicle-free zones, delivery hours, etc. The municipal police have the authority to enforce these local regulations (issuing fines for entering a prohibited zone, removing incorrectly parked vehicles). **Removing illegally parked vehicles** from pavements or pedestrian zones is not only a matter of order, but also of safety – a parked car could be used as a means of committing a terrorist attack or hinder the operation of barriers (e.g. someone could drive around a bollard on the pavement). Therefore, guards should emphasise **keeping protective zones free of vehicles**.
- **Support in closing roads and organising events:** During temporary road closures (e.g. for demonstrations, street races, concert) in the anti-terrorist context, guards may **set up and guard barricades**, e.g. station themselves at the entrance to a closed street with a police car across the road to physically stop any attempts to enter if necessary (the police car can also act as a barrier in an emergency, although the lives of officers are obviously the priority here). Guards may also direct authorised vehicles to take detours so that they do not drive into the crowd.
- **Operation of security devices:** Many local governments entrust municipal police with the administration of access control systems – for example, **the remote control for lowering automatic bollards** is often at the disposal of patrols or the police officer on duty. Guards may be tasked with opening barriers for municipal service vehicles, closing them after deliveries, etc. It is important to have clear procedures in place: who decides when to raise/lower the bollard, so that unauthorised entry does not occur due to a communication error. It is good practice to equip the security control centre with CCTV monitoring (city surveillance) of entrances to protected areas – the guard can

remotely verify the need for entry and unlock the barrier, while also having a recording of the event.

- **Monitoring and rapid response:** Many local governments have access to **urban video surveillance systems**, often operated by municipal police. Camera operators should be trained to pay attention to unusual vehicle behaviour in pedestrian areas, such as a car speeding towards a closed street or a van repeatedly circling near a gathering. **Early detection of a threat** will allow the municipal police or police to respond (set up an additional roadblock, stop the driver before they enter the crowd). Municipal guards, as the first on the scene, can attempt **to redirect traffic** or **evacuate people** if they notice a speeding vehicle.
- **Cooperation with the Police and other services:** in a terrorist threat situation, the main role falls to the Police (primarily Police counter-terrorist units), but the municipal/communal police may perform auxiliary functions, such as securing the surrounding area, directing people to safe areas and providing information to the crisis management team. It is good to establish communication channels and division of tasks in advance (e.g. the guard immediately closes traffic on neighbouring streets so that emergency services have free access). **It is also worth involving guards in anti-crisis training and exercises** related to terrorist attacks – their knowledge of the city's topography and experience in working with residents can significantly improve the course of action.
- **Education and awareness raising:** Municipal police can conduct **information activities concerning** appropriate behaviour in emergency situations on the street. This includes, for example, providing advice on '**what to do if you see a car speeding into a crowd**' – run sideways, hide behind the nearest obstacle (wall, tree, lamppost), warn others. Conscious and alert citizens are an additional element of the security system, and guards can shape this alertness by teaching people to recognise danger signals and respond appropriately.

In summary, municipal/communal police provides a natural support in the implementation of the activities described in these recommendations. In order to fully exploit its potential, **the local government should clarify the scope of its competences** (e.g. include tasks related to anti-terrorist security in the regulations governing

the municipal/communal police) and **provide appropriate training** in this area. Good cooperation between the municipal/communal police, the Police, road administrators and event organisers will translate into more efficient and effective security at the local level.

Legal and organisational aspects

Implementation of the described solutions requires consideration of a number of legal and organisational issues. The most important ones that local authorities should bear in mind are discussed below:

- **Administrative responsibility:** The safety of public spaces is the responsibility of local government and state administration bodies. In practice, **the city president/mayor/commune head** is responsible for public order tasks in their area, cooperating with the provincial governor and state services. The installation of fixed safety measures (posts, barriers) on municipal roads requires a decision by the road administrator (often the municipal road authority, subordinate to the president) – hence, the local government must ensure formal approval of traffic organisation projects that take into account the new barriers. It is worth appointing a **public space safety coordinator** within municipal structures – a person or unit responsible for planning and supervising the implementation of these measures. This may be part of the municipal crisis management team or a separate presidential representative for security. It is important to clearly define who maintains and monitors individual devices (e.g. whether the investment department, road administration or an external company is responsible for servicing automatic bollards).
- **Coordination with owners and managers of private public spaces:** in cities, many **formally private** spaces serve a de facto public function – e.g. shopping centre arcades, squares between office buildings, private university campuses, supermarket car parks, etc. The local government cannot unilaterally impose its installations there, but **cooperation is crucial**. It is recommended to invite the managers of such facilities to **joint meetings** within the framework of a safety committee or crisis management team. It is worth developing **minimum security standards** for such

places – e.g. encouraging (or requiring in administrative decisions, if possible) the installation of bollards in front of shopping centre entrances and the installation of barriers at driveways to passageways. A **safety audit** can be used here: municipal services (e.g. the State Fire Service, Police, municipal police) in cooperation with the owner inspect the facility and suggest improvements. **Practical exercises** (e.g. simulation of an attack or evacuation in a shopping centre) involving the services and facility staff will also reveal shortcomings and allow procedures to be developed. Legally speaking, the owner of the site is responsible for ensuring the safety of users – the municipality may therefore argue that **implementing security measures is also in their interest (limiting civil liability)**. In the case of large public facilities (stadiums, shopping centres), a security plan agreed with the Police is often required – it is worth ensuring that it also takes into account the **threat posed by vehicles**.

- **Compliance with building regulations and technical regulations:** Installation of fixed anti-terrorist barriers may be subject to building regulations. Some elements (e.g. walls, foundations for barriers) will require a building design and a building permit or notification of construction works. It is necessary to ensure that the design is prepared by a person with the appropriate qualifications. **The placement of barriers on public roads** must comply with traffic regulations – approval of the new traffic organisation (signs, traffic safety devices) is required. In addition, **health and safety as well as fire regulations** require that safety measures do not impede the evacuation of people and access for emergency services. This means, for example, that **pedestrian walkways next to posts must remain passable** (ensuring a minimum passage width), and if a street is closed, it must be possible to quickly remove the barrier in case the fire brigade needs to enter. In areas under the supervision of a conservation officer (e.g. old towns), **the choice of security measures** should be agreed with the conservation officer – sometimes concrete blocks cannot be placed freely because they spoil the historical layout, so alternative solutions must be sought (e.g. stylised posts that fit in with the aesthetics of the place).
- **The Act on crisis management and planning documents:** Pursuant to the Act on crisis management, each municipality

should have a **Crisis Management Plan** that identifies potential threats (including terrorist threats) and defines response procedures. In the context of vehicle attacks, it is advisable for this plan to:

- include a **scenario for such an attack** (risk analysis, identification of the most vulnerable locations in the municipality),
- specify the **forces and means** of counteraction – i.e. an inventory of available security measures (e.g. a list of locations where there are fixed barriers; a warehouse of mobile barriers; available trucks and vehicles for blocking roads, together with contact details for the operators),
- assign **roles and responsibilities** – e.g. who decides to raise the security level in the event of an increased alert (BRAVO/CHARLIE/DELTA), who is responsible for physically setting up barriers in the event of a threat, etc.,
- include **cooperation with other entities**, e.g. with the administrators of national roads running through the city (if it is necessary to block the exit from such a road to the event site), with neighbouring municipalities (when the event has a wider impact), with the provincial crisis management centre (reporting). Regular updates to the plan and exercises (even at the level of decision-making games) will help maintain readiness. In addition to the crisis plan, **local spatial development plans** for sensitive areas may also include safety guidelines (e.g. a requirement to design shopping malls with elements that block entry).

- **Financing safety investments:** The purchase and installation of professional anti-terrorist systems can be costly. Local governments should seek **available sources of external financing**, such as European funds (the EU Internal Security Fund provides funds for the protection of public spaces). It is worth preparing **projects justifying the need** (e.g. when applying for funding for the installation of automatic barriers in the old town, refer to risk analyses and good practices from other cities). Furthermore, involving private entities (e.g. shopping centres) in joint initiatives, costs can be shared – for example, the city builds the infrastructure for automatic locks, and the shopping centre provides the devices themselves. **Maintenance costs** should also

be planned for: servicing, repairs, periodic crash tests (if required by the manufacturer). It is better to invest in a certified solution than to be responsible for a faulty half- measure that will fail – this awareness should guide decision-makers when allocating funds.

Formal safety requirements for contractors and employees performing activities related to anti-terrorist barrier access control systems or their integration

It is reasonable to check whether the contractor has a licence from the Ministry of the Interior and Administration to conduct activities in the field of personal and property protection. In the case of access to classified information, it is advisable that the contractor has a valid Facility Security Clearance up to the 'CONFIDENTIAL' level without safeguarding capacity. Compliance with this requirement does not include the obligation to have a registry.

Employees performing activities related to access control systems or their integration should:

- hold a personal security clearance of at least 'CONFIDENTIAL' level;
- be included in the list of qualified technical security personnel, according to the Act of 22 August 1997 on the protection of persons and property (Journal of Laws of 2025, item 532).

Employees performing general construction work (e.g. excavation, cable installation, equipment assembly) are not required to have personal security clearance, however, they should have a current certificate of no criminal record. These requirements also apply to subcontractors involved in installation or maintenance work.

Adaptation of recommendations to different local government units

The recommendations presented are of a general nature – their implementation will look different in a metropolis than in a small town. Each local government unit should **conduct its own analysis of needs and possibilities**, taking into account factors such as: the volume

of tourist traffic, the number of mass events per year, urban layout (e.g. historic old town vs. scattered housing estates), budget and staff.

Here are some tips on how to adapt the recommendations to local conditions:

- **Small towns and municipalities with limited budgets**: The priority should be to **identify the most vulnerable locations** (e.g. the main market square, the pedestrian zone near the town hall, the harvest festival grounds) and implement even simple measures there. If an entity cannot afford automatic bollards, it should start with **fixed posts or concrete planters** – the unit cost is not high, and they can be installed gradually. Many such municipalities already have street furniture elements that only need to be **strategically placed**. You can also look for **used equipment** – e.g. obtain barriers from a larger town (after modernisation) or from demobilisation. It is also important to **train municipal guards and volunteer fire brigades** in responding to such incidents, because in a small community they will be the first on the scene.
- **Medium-sized towns:** Already having some infrastructure and a budget for investments, they should take a **systematic approach** to the issue. It is worth to develop a **municipal programme to improve the safety of public spaces** over several years, with funds allocated in the budget. Such a programme could, for example, include: stage I – installation of barriers in the market square and main pedestrian zone, stage II – purchase of mobile barriers to secure events, stage III – creation of a monitoring centre, etc. It is also important to exchange the experience – for example, through the Union of Polish Metropolises or other city associations, it is possible to draw on the knowledge of leaders (large cities are often willing to share the solutions they have developed). Medium-sized cities should also consider **inter-municipal exercises** – terrorist threats rarely affect only one municipality.
- **Large cities and metropolises:** Here, residents' expectations regarding security are high, and the potential risk (due to the attractiveness of the targets) is greater. Large cities should invest in **the most effective technologies available**, such as **integrated systems** (barriers linked to traffic lights, remote control of barriers from a monitoring centre, sensors that detect

unusually fast-moving vehicles and automatically raise barriers). Budget is obviously a barrier, but large entities have easier access to external funding and can justify their needs on security grounds, for example critical infrastructure or of international importance (tourism, institution headquarters, etc.). It is important to maintain a **network of cooperation** with experts – e.g. using anti-terrorist security advisers (plans can be consulted with the Internal Security Agency or police terrorism specialists). A large city should also commission **external audits** from time to time – a fresh expert perspective will help identify gaps that its own services may have overlooked.

- **Flexibility and updating:** Terrorist threats evolve – new techniques emerge (e.g. in the future, potentially remote takeover of autonomous vehicles), and the technical capabilities of security measures also change. Therefore, these recommendations cannot be regarded as an exhaustive list. For instance, the European Commission publishes guidelines for protecting public spaces from attacks (e.g. The guideline to selecting barrier solutions against vehicle-ramming attacks[16]), and industry organisations present new technical solutions (conferences, security fairs). It is worth taking advantage of this. It is equally important to **analyse incidents** that do occur – if a vehicle-ramming attack takes place anywhere, the question must be asked: *could a similar scenario occur in a given city? Are there measures in place to prevent this, and if not, what needs to be improved?* Learning from the experiences of others is the key to continuous improvement in security.

Summary

A safe public space is one where **people can freely gather and enjoy themselves without being unnecessarily disturbed by the sight of fortifications**, while at the same time **potential aggressors encounter hidden obstacles** that thwart their plans. This goal is achieved through **multifaceted measures**: from fixed infrastructure (barriers, posts, railings), through organisational solutions (security

[16] https://ec.europa.eu/newsroom/pps/items/665632/en#:~:text=JRC%20Guideline%20Selecting%20proper%20security,now%20also%20available%20in%20French

plans and procedures during events), to the human factor (vigilance of services and citizens).

Well-designed and implemented measures can significantly **reduce the likelihood of a successful attack or limit its impact**. As indicated, even simple barriers can save lives by delaying a vehicle or changing its trajectory, giving people extra seconds to escape. Ultimately, however, no measures can provide a 100% guarantee, which is why a **comprehensive approach** is so important: combining different solutions and maintaining readiness to respond to unforeseen situations.

Local governments in Poland, drawing on the experiences of other European countries, can **effectively improve the safety** of their towns and municipalities without straining their budgets or disrupting the friendly nature of public spaces. The key is to plan ahead (before a tragedy occurs), to cooperate continuously with experts and services, as well as to educate the local community. This is how cities that are resilient to threats but still **open and friendly** are created – places where safety becomes a natural part of the infrastructure, almost invisible to the casual passer-by, but ensuring their peace of mind.