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EUROPE: PRIVATE SOLUTIONS TO SECURE PUBLIC SPACES EVOLVE IN RESPONSE TO INCREASING VEHICULAR ATTACKS

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Since July 2016 **vehicular attacks have fast become the deadliest and most widespread type of terrorist attacks in Western Europe**, representing nearly 80 percent of fatal casualties in all terrorist incidents that happened at that period. Although this trend is far from new - Al Qaeda's Yemeni branch had encouraged its Western recruits to use trucks as weapons as early as 2010 - the **phenomenon has proliferated since the Nice promenade truck attack** on July 14, 2016, which killed 84 people and maimed 434 others, becoming an 'inspirational example' for the Islamic State propaganda and its followers.

These methods, first used by Islamist terrorists, have since been embraced by far-right extremists and also triggered copycats among mentally unstable people (as was the case in Marseille on August 21). For instance, the June 19 terror attack on Finsbury Park Mosque in London saw Darren Osborne, a 47-year old man who had expressed anti-Muslim views, drive his van into a crowd of worshipers, leaving one person dead and eleven people wounded. Another incident largely qualified as "domestic terrorism", occurred on the 13th of August when James Fields ploughed his car into a crowd of anti-fascist protesters in Charlottesville (USA), killing a woman and injuring nineteen others.

In the West, at least **13 attacks are to be deplored since the Nice carnage**, with 8 occurring in 2017, which have led to the loss of at least 138 lives (excluding perpetrators). The main countries to be targeted by vehicular attacks have been France, Germany, Israel, Spain, Sweden, the United Kingdom and the United States while Belgium witnessed a failed car-ramming attempt in the city of Antwerp in mid-2017. Crowds in iconic landmarks such as the Champs-Elysées (France) or Las Ramblas (Spain) have been attacked alongside everyday locations including Ohio State University (USA), exemplifying the devastating **capacity of this modus operandi to sow violence and associate fear with a variety of sites.**

This shift to unsophisticated and thus less predictable terrorist tactics has triggered **a demand for innovative solutions in helping secure public spaces** from vehicular attacks. In turn, this has led to an **expansion and diversification of the se-**

curity market, where start-ups and entrepreneurs have multiplied alongside the traditional industry giants. Such rapid reaction on the demand of new security solutions is not surprising, given that following the latest series of vehicular attacks in Western Europe and constant calls from the Islamic State to its supporters to use such methods against 'crusaders', the **protection of 'soft targets' such as pedestrians in crowded public spaces has become a priority.**

These vehicular attacks lead **architects and urban planners to approach materials and so-called street furniture differently** in order to avoid scenarios like those witnessed in Nice, Berlin or Barcelona. They have been largely solicited by public authorities in order to adapt for their **furniture and designs to meet heightened security criteria.** A striking example of this evolution is the "anti-ballistic" wall which is being constructed at the base of the Eiffel tower. Three meters high and entirely transparent, it is both bulletproof and aimed at preventing individuals or vehicles storming the building while trying to remain aesthetically harmonious with the surroundings. Elsewhere in Europe, **"anti-ramming landscape features"** as they are known in the jargon of architects have sprung up: from large concrete letters spelling out the word Arsenal in front of the London Stadium to oversized flowerpots in Florence, Italy, cities are integrating bollards and barriers into urban areas for added safety.

Law-enforcement authorities have also taken it upon themselves to design or equip their units with more efficient tools in the fight against such kinds of attacks. A product called Talon, recently unveiled by Scotland Yard, falls precisely in this category. This **spiked, vehicle-stopping net** is designed to stop vans and lorries targeting crowds in terror attacks. They can be "laid out in less than a minute and halt even heavy vehicles by puncturing their front tires and then becoming entangled in their wheels".

Similarly, **portable modular barriers**, such as the Israeli company Mifram's Mobilar Vehicle Barrier, have seen their popularity soar among the French and German police forces. Their "special design (L shaped) stops vehicles travelling at high speeds by transferring the vehicles horizontal momentum to vertical momentum" and are **far easier to deploy than erected cement blocks while presenting no risk of fragmentation upon impact**.

While most of proposed solutions against vehicular attacks represent various forms of barriers or fences, **new technologies are also being looked into in order to act before attacks can even fully unravel**, ensuring minimal impact on the general public. Going beyond the already well-established Autonomous emergency braking (AEB) technology equipping new cars since 2015 (as per EU regulation), the idea of **a remote 'kill switch' to immobilize heavy goods vehicles** (HVG) is reportedly being explored by UK government scientists. Dubbed 'Project Restore', which stands for the REmote STOpping of Road Engines, this technology would be a built in standard and would enable authorities to interfere with the electronic management of a high-risk vehicle in order to immobilize them.

Similar in nature, a UK-based company named Teledyne e2v, has designed **a "target deactivation technology"** which is "capable of bringing moving targets across land, sea and air to a controlled stop at a safe distance" by employing a directed pulse of L

Band (1 to 2 GHz) and S Band (2 to 4 GHz) **microwave energy to disrupt the electronics of the target vehicle's components** up to a distance of 50m. This technology, developed as early as 2014, has been adopted by some police units in the United States and is likely to see its use increase.

Another solution being developed is **'geo-fencing' technology.** Should an unauthorized vehicle cross the **electronic boundary of a geographically defined area**, the system would connect with their on-board computer and limit the speed to a safe level or even prevent driving altogether. Following the attack in Stockholm in April 2017, vehicle manufacturers Volvo and Scania have been working in conjunction with the Swedish Transport Administration on trials of this system.

Trak Global Group on the other hand - a UK firm - have been developing **black box-style equipment that would create IDs linked to drivers' smartphones**. This "tool could prevent hijackings by disabling vehicles when the driver isn't nearby and logged in". This idea is particularly interesting for **preventing the theft of large means of transportations** such as was the case for the lorries used in the 2017 Jerusalem and Stockholm attacks.

Vehicular attacks across Europe have also prompted **further research and innovation into surveillance and detection technologies**. The United Kingdom has for example recently allocated £2 million "to fund research into cutting edge technology and behavioral science projects designed to keep people safe" by "using the crowd as a sensor". A **new type of camera** is also being developed with funds from the European Union and tested in Spain. The FORENSOR project, a consortium of eleven partners from the EU, will eventually lead to a miniaturized camera, able to survive on one-tenth of the power of a normal surveillance camera and easily concealable, which will be able to **scan a scene and differentiate what it sees, immediately flag suspect scenes or behaviors**, such as abandoned packages or someone driving around a neighborhood suspiciously.

Another **noteworthy solution in detection techniques is PATSCAN**, a NATO-funded project developed by Patriot One Technologies. This "innovative cognitive microwave radar system is designed to instantly detect concealed weapons, even on moving targets" by "analyzing metal content and then relating that content to a database of known weapon signatures" which would prove **helpful in determining whether individuals emerging from a vehicle are armed or not**, as was the case during the Westminster attack.

In the future, the **introduction of self-driving vehicles equipped with collision avoidance technology** may significantly reduce the risk of vehicular attacks, but it will also inevitably raise the **issue of a potential hijacking of the car's electronics.**

Today vehicular attacks are cheap, easily planned and carried out and hard to predict. The **growing variety of security solutions, proposed by public and private initiatives to protect crowded areas is an encouraging development.** Although these measures and innovations are welcome additions to law-enforcement arsenals and help in mitigating this threat, many of them are costly and do not eliminate the possibility of an attack but merely shift the target. **No foolproof system exists: any gathering, anywhere is a potential target**. New technologies may deter or

impede a terrorist act in a particular, geographically-defined perimeter placed under the protection of some of the products or technologies aforementioned; it is not however feasible to turn entire cities into bunkers.

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