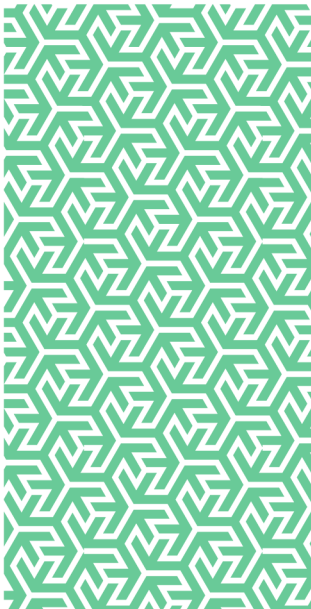



rmp

Risk control

Protecting buildings from
vehicle attacks



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Protecting buildings from vehicle attacks

Introduction - What is Terrorism?

The UK describe terrorism as *'the use or threat of action, both in and outside of the United Kingdom, designed to influence any international government organisation or to intimidate the public and for the purpose of advancing a political, religious, racial or ideological cause'*¹.

Examples can include:

- Serious violence against a person or damage to property
- Endangering a person's life (other than the person committing the offence)
- Creating a serious risk to the health and safety of the public
- Action designed to seriously interfere with or seriously disrupt an electronic system.

It can take many forms including IED and bombs, biological, radiological, suicide, cyber, chemical and vehicles. The use of a vehicle as a weapon is where it can be used intentionally to injure and kill people. It is a low complexity methodology requiring little or no training which can make it harder to detect due to the lack of planning. Thankfully, vehicles used to attack buildings and the people within them are rare. Despite this they do, and have occurred, not just across the world but in the UK as well so complacency cannot be underestimated. People can commit these offences due to motivation that is racial, political, ideological and personal and is often a strategy rather than a random act of violence.

Sadly, to maximise impact crowded places will often be seen as an attractive target. The Home Office (HO) describes a crowded place as *'a location or environment to which members of the public have access that may be considered potentially liable to terrorist attack by virtue of its crowd density'*. Places where large numbers congregate could be both permanent and temporary, large or small. The HO recognise this could include iconic buildings.

Hostile Vehicles

This is one of the ways that terrorists can target buildings and public realm spaces. A major consideration by counter terrorism is how to prevent unauthorised access of vehicles and maintaining integrity of these places. RIBA, who design spaces and buildings state that there are five styles of vehicle threat^{7,9}.

The first is **parked** whereby the vehicle is stationary and contains explosives. **Encroachment** is where the perpetrator identifies and uses a gap in the perimeter defences. This may include 'tailgating' a vehicle through a barrier system. **Penetrative** is based on ram raiding whilst **entry by deception** involves human deception or a Trojan vehicle. Finally, **entry by duress** to a driver, with access or

authority, or the operator of the barrier themselves such as security.

UK Threat Levels

The UK has 5 levels of risk as defined by the Joint Terrorism Analysis Centre and M15. These levels are Low – an attack is highly unlikely, Moderate – an attack is possible but not likely, Substantial – an attack is likely, Severe – an attack is highly likely, and Critical – an attack is highly likely in the near future. The UK current level is considered to be 'substantial' as at March 2025¹⁰.

Previous Attacks

9/11 attacks (2001)

Aeroplanes were hijacked and driven into the twin towers in New York causing both towers to collapse. A third plane crashed near the Pentagon and the last crashed in Pennsylvania. It was thought to be heading for the White House. 67 UK citizens lost their lives.

Glasgow Airport (2007)

In this incident a vehicle was driven at the glass doors of Glasgow City Airport terminal and turned into an inferno. It was packed with 60 litres of stolen fuel alongside gas containers. Five people were injured. The jeep failed to explode and security bollards outside the entrance stopped the vehicle from physically entering the terminal, where 4,000 people were waiting to board flights.

Westminster Bridge London (2017)

An SUV was driven into pedestrians crossing the bridge in a hired SUV. Four people were killed and 32 injured. The attack moved to Parliament where an on-duty police officer was killed.

London Bridge (2017)

A hired van was directly driven at pedestrians on the bridge, resulting in the death of 2 people. A later attack then occurred at Borough Market

Finsbury Park (2017)

A hired van was driven into a crowd of worshippers. One man was killed and 10 received treatment for injuries.

Parliament Square (2018)

A premeditated attack occurred on civilians by driving at cyclists at a set of traffic lights and then driven at Police Officers guarding the side entrance to the Palace of Westminster.

Principles

The National Protective Security Agency (NPSA) provides guidance to mitigate the risks for buildings and sites from an attack. It uses five principles ²:

Deter: stop or displace the attack.

Detect: verify and initiate the response.

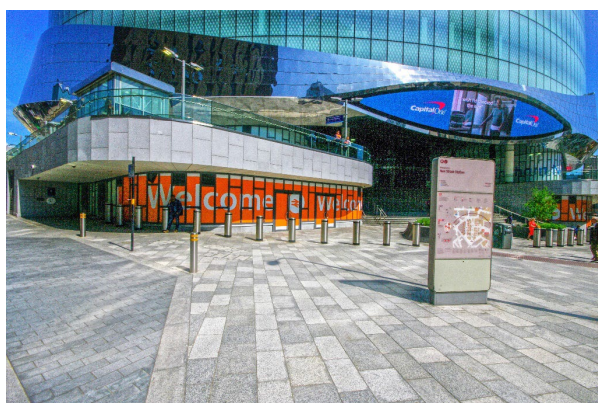
Delay: maximise delay through the use of appropriate security measures.

Mitigate: minimise the consequences of an attack against the site.

Respond: actions to prevent the goal of the attack being completed.

Perimeter

To prevent damage to buildings it is important to manage the perimeter areas through a number of measures, all designed to delay or prevent access. Providing a safe zone between the perimeter and building will need to be maintained. This could go as far as having pedestrian zones and the creation of public gardens where a car park previously stood.



Birmingham New Street Station entrance

Fences and gates

These act as a barrier to vehicles. Gates should be given additional consideration as, whilst they act as a deterrent from attack, they must also provide emergency access and egress to and from the site.

Design considerations

Blast Management

When designing new buildings consideration should be given to building materials, which reduce the risk of fragmentation including blast resistant glazing and structural design, which reduces the risk of collapse ^{3,4}.

Glazing can have two functions namely blast mitigation and protection. Blast mitigation measures feature the use of anti-shatter film, bomb blast net curtains and laminated glass ⁵.

Protection mitigation utilise laminated glass in normal window frames, laminated secondary glazing and blast resistant glazing in special blast proof frames.

Doors and locks should be able to withstand entry from armed intruders and provide robust ground floor facade material, which provides cover for people in the event of an attack ⁶.

Building Management and Perimeter Barrier entry

Access will be required for employees and visitors to move through a building perimeter. It is still necessary to provide security and controlled

access through individual access cards, CCTV, direct challenge, control rooms, pre visit authorisation and vehicle inspection.

External barriers or a strengthened perimeter prevent a penetrative (ramming) or close proximity (parked or encroachment) attack.

Measures need to reduce damage from an attack or prevent the attack completely.

Any entrance arrangements need to resist hostile entry. These can be both passive, such as physical static measures by design, and active measures such as security controls.

Communication systems must be capable of passing on immediate advice to those caught up in a firearms attack.

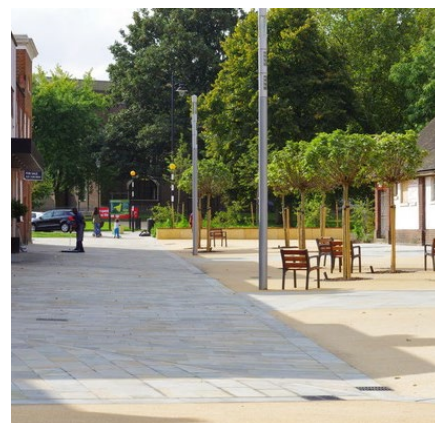
Traffic Management

Structural measures need to prevent access to, or close proximity, of unscreened vehicles to the building or space. These measures can result in total traffic exclusion, controlled access, footway protection, traffic calming, permanent with occasional access, or temporary barriers ⁸.



Measures can reduce the speed of vehicles approaching the site, or its defences, such as bends, chicanes and traffic calming.

The National Protective Security Agency advises that street furniture can take a variety of forms including bus stops, planters, bike racks, seating, lighting and signs. This can be further enhanced by security barriers through bollards (fixed or raising), gates, raised arm barriers, and fences. Further design features are ditches, walls and statues or art installations.



National Assembly for Wales, Cardiff

Parking – should this be allowed in underground car parks below the building?

Deliveries – consider how they will gain access, with vehicles challenged in every scenario.

Better oversight

When designing spaces around a building through landscaping consider incorporating crime prevention measures. This can include:

- Clear lines of sight around the building
- Water features, whilst wildlife friendly, can also provide a physical barrier for vehicles.
- Absence of recesses on the façade or elevations of the building
- Uncluttered street furniture and appropriate lighting.

- Well managed and maintained litter free building surrounds that reduce the opportunity for suspicious hidden items and suspect activity to go unnoticed
- ANPR, CCTV and security guards to provide formal oversight
- Orientating the building so that it overlooks public space and neighbouring buildings to support informal oversight by those who use and visit the location
- Well-managed access points and reception facilities that offer less opportunity for intruders to go undetected and may deter them from taking further action.

Additional considerations for security

- Be security aware, monitor and report unusual behaviour
- Report driver and operator concerns
- Waste management – who has access to the bins and is this restricted?
- Car parks – can these be placed away from the building concerned. Is it overseen by ANPR and barrier controlled? Do vehicles need to be pre-booked for entry?

Summary

There are a number of ways to design or retrospectively improve building safety from threat of attack

1. Access control both outside the perimeter and at the building with ID, and restrictions to the wider building such as swipe cards and door key codes. Built controls can include vehicle security barriers and ANPR.
2. Hostile vehicle mitigation measures including control of deliveries, and restricted loading bay access. The key is to prevent unauthorised vehicles from getting too close to buildings.

3. Surveillance and CCTV, which is actively monitored, rather than acting only as a deterrent. It can help detect and identify unusual or concerning activity.
4. Reception should be designed so that vehicles do not have direct access and cannot be driven at or into the building. Using design measures helps prevent vehicles coming into close proximity such as planters, bollards and concrete barriers.
5. Maintain communications for business continuity.
6. Install hostile vehicle mitigation barriers which should be at least 30m away from the buildings. Stand-off is the distance between the building and a bomb, with blast loading distance reducing over 30 metres. If this is not possible in dense urban areas then pedestrian zones can be created which limit vehicle presence. Reception can be moved to higher floors leaving public atriums at street level.
7. Service areas. The rear doors may be poorly monitored and could provide an easier access for someone to gain unauthorised access. It is not uncommon for these doors to be propped open or left unlocked.
8. Hostile Vehicle Mitigation - Schemes for the streetscape
<https://www.npsa.gov.uk/resources/npsa-hvm-schemes-high-street>
9. Hostile Vehicle Mitigation – Publicly accessible locations
<https://www.protectuk.police.uk/hostile-vehicle-mitigation-hvm>
10. Current Terrorism Status
<https://www.gov.uk/terrorism-national-emergency>

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2. National Protective Security Authority – protecting your assets
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4. National Protective Security Authority – Structural framing
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6. National Protective Security Authority, Forced Entry Standards
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7. RIBA guidance on designing for counter terrorism
<https://www.frontierpitts.com/wp-content/uploads/Documents/RIBAGuidanceoncounterterrorism.pdf>

Further information

For access to further RMP Resources you may find helpful in reducing your organisation's cost of risk, please access the RMP Resources or RMP Articles pages on our website. To join the debate follow us on our LinkedIn page.

Get in touch

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