P10 – Protective Security in the Public Realm

ACKNOWLEDGEMENTS
This guide has been drafted by security design specialists and developed in collaboration with various teams across the Council, including the Public Safety team, utilising information from the National Protective Security Authority (NPSA) as a basis.

INTRODUCTION

What is the purpose of this factsheet?

The purpose of this factsheet is to inform a design approach to protective security in the public realm that is appropriate, proportionate, and sensitive to the local context.

What is 'Protective Security'?

Protective security measures within the context of this guidance are primarily defined as physical public realm interventions that act as a barrier to vehicle borne threats and are typically installed at locations which are predictably crowded and deemed at risk, with a particular focus on:

- Hostile Vehicle Mitigation (HVM) measures (temporary and permanent)
- Protective landscape interventions including street furniture and planting

It should be noted that the installation of any security intervention should be the result of a carefully developed holistic security strategy, considering a range of potential physical, technological and operational options. The guidance therefore describes a wider security conscious approach to design development, to assist in justifying and discussing intervention options.

Who is this factsheet for?

The guidance is intended primarily for use by project managers and designers involved in the planning and design of streets and major works projects for the City of Edinburgh Council (referred to as 'the Council'). For Capital Maintenance schemes where protective security is identified as a requirement, the Public Safety team will form an integral part of the overall project team to provide the necessary advice and guidance.

FACTSHEET CONTENTS

*The content of this guidance draws on industry best practice, while also describing local design considerations. Users of this factsheet are encouraged to consult the **Women's Safety factsheet** for complementary guidance on (perceived) safety in public spaces.*

*The information provided is not exhaustive, nor prescriptive – please refer to national guidance and standards produced by the **National Protective Security Authority (NPSA)** for further information. Security requirements should always be considered on a case-by-case basis.*

PART 1: A PROTECTIVE SECURITY DESIGN APPROACH

1.1 Key Considerations for Project Managers

It is important to **consider security in all public realm projects at RIBA Stage 0 Strategic Definition, however only certain projects will require a security measure and the specific involvement of security stakeholders**.

Project managers should refer to the following flow diagrams over the next two pages to guide the initial applicability of a project and subsequent involvement of wider teams. In cases of uncertainty, it is advisable to consult with relevant security stakeholders and/or a Suitably Qualified Security Specialist (SQSS).

Early consideration of security in applicable projects not only fosters a more cohesive design integration and cost saving, but also minimises the risk of design flaws that could introduce security vulnerabilities.

THE PROTECT DUTY

The Terrorism (Protection of Premises) Act 2025, also known as Martyn's Law, was introduced to ensure that major premises and events are well prepared to respond to a terrorist attack.

Project managers and designers must refer to the Act and its guidance (Terrorism (Protection of Premises) Act 2025: Overarching factsheet) for any project that interfaces with a major public building, attraction or public space, as well as for any major event space.

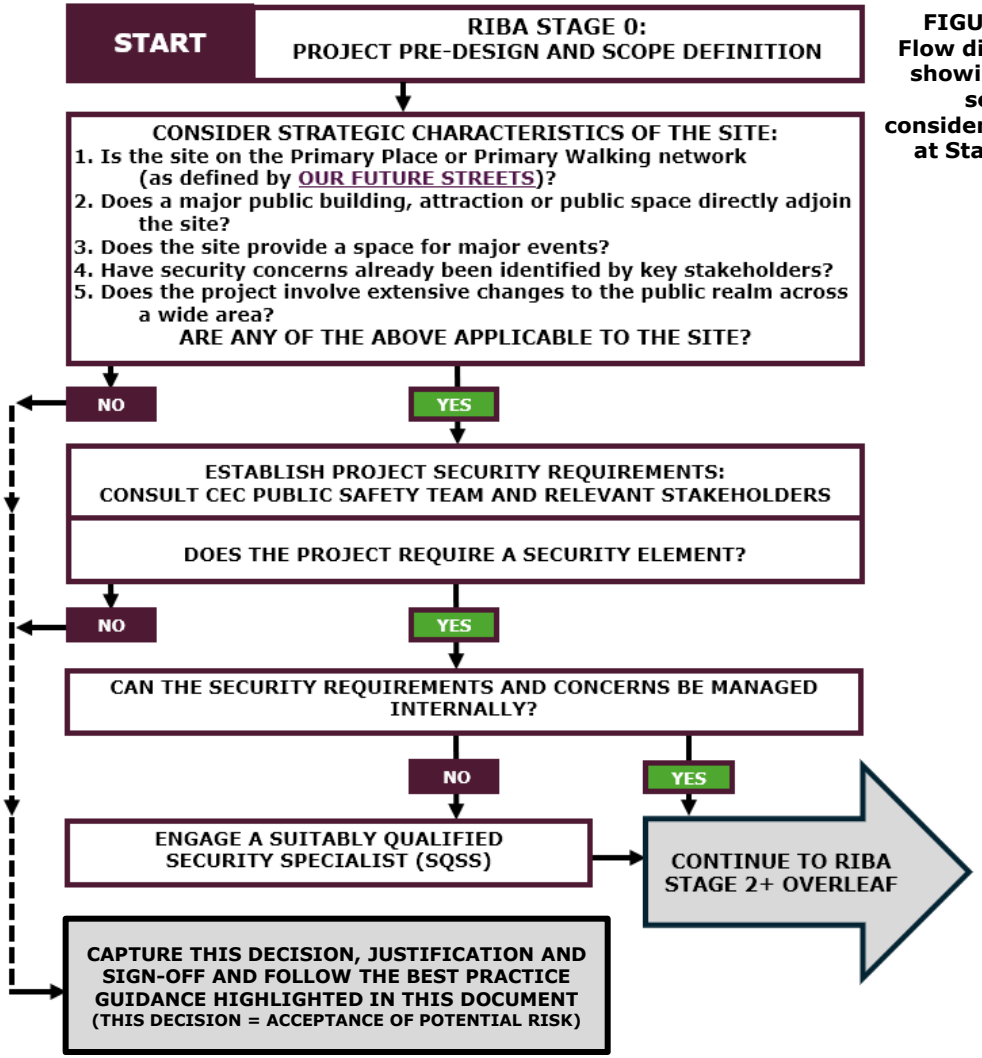


FIGURE 1A. Flow diagram showing key security considerations at Stage 0-1

1.1 Key Considerations for Project Managers (continued)

At RIBA Stage 2 onwards, technical assessments are likely to be deemed necessary. The flow diagram provides an overview of key considerations following an assessment(s) and the continued involvement of stakeholders to inform decisions. Further details on these assessments are covered in section 1.4 Specialist Security Assessments.

SECURITY STAKEHOLDER ENGAGEMENT

Engaging key stakeholders from the initial scoping phase and throughout the project lifecycle is essential, with the extent of engagement dependent on the project's nature and scale.

Consider including the following stakeholders:

- Council teams including Public Safety, Traffic Signals, CCTV / VSS, Strategic Transport and Planning.
- External security stakeholders such as Police Scotland (including local Counter-Terrorism Security Advisers (CTSAs)).

Management partners for the World Heritage Site (Edinburgh World Heritage and Historic Environment Scotland) should also be involved at the initial scoping stage, where relevant.

It is important to note that Anti-Terrorism Traffic Regulation Orders (ATTRO), and Traffic Regulation Orders (TRO) may require approval from both the local authority and police. Collaboration with these stakeholders ensures that security measures align with regulatory requirements and best practices.

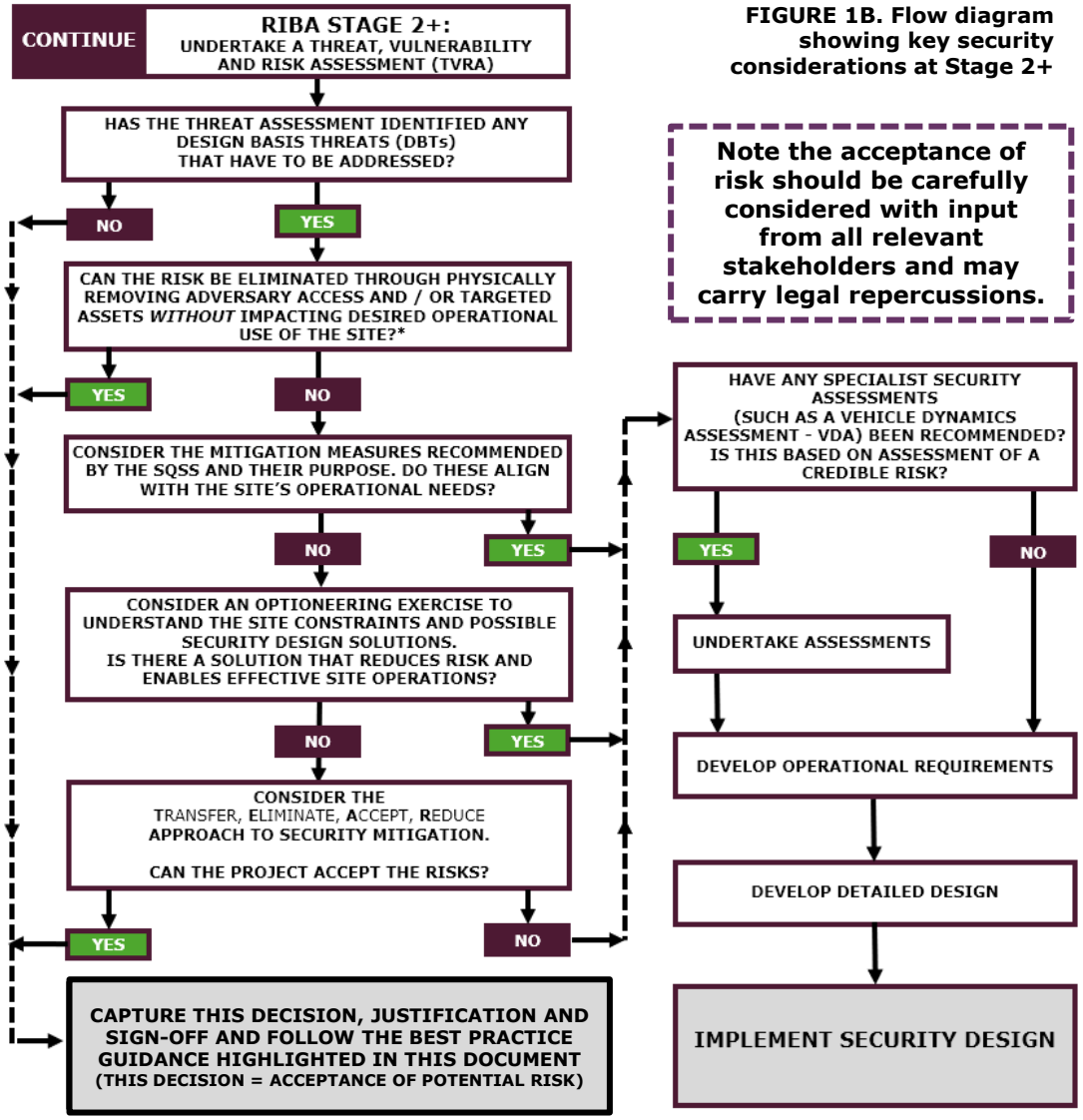


FIGURE 1B. Flow diagram showing key security considerations at Stage 2+

*** 'Operational use of the site' may refer to: use of space for events, sufficient widths for walking/cycling, or preserving/enhancing the character and appearance of the historic environment, amongst other things**

1.2 Taking a Risk-Based Approach

RISK-BASED SECURITY DESIGN

In risk-based design, the emphasis lies in addressing threat deemed credible to the location.

Public realm and major works projects often face heightened risks due to factors such as the introduction of areas in which the public are invited to dwell, and changes to the significance of an area.

The typical approach to comprehensively understand the risks to a space, involves **undertaking a Threat, Vulnerability and Risk Assessment (TVRA)** where a Suitably Qualified Security Specialist (SQSS) identifies the Design Basis Threats (DBTs) specific to the project.

The DBTs offer insights into the specific threats that should be addressed in a project design, with the risk assessment connecting the DBTs to site vulnerabilities.

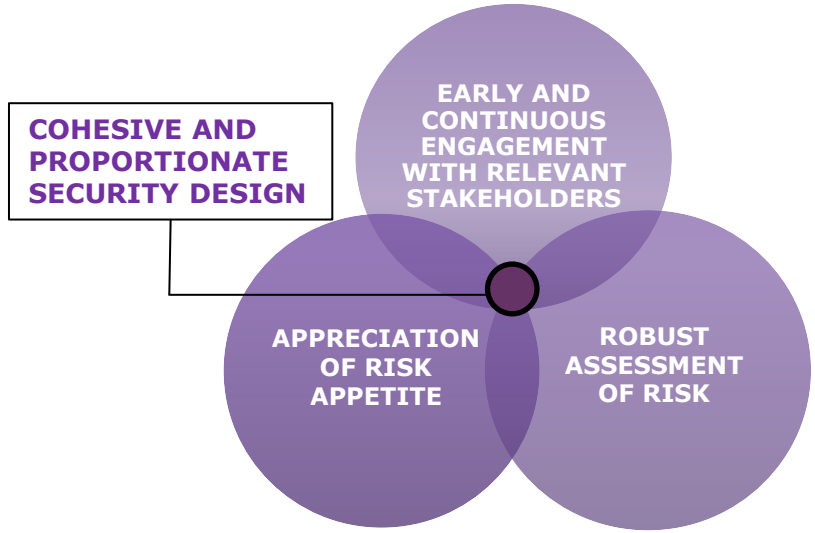


FIGURE 2. RISK-BASED SECURITY DESIGN CONSIDERATIONS

RISK APPETITE

Understanding a project's risk appetite is key to interpreting the results of a security assessment and developing mitigation measures. **'Risk appetite' refers to the level of risk a project is willing to accept**, acknowledging that complete risk elimination may hinder other necessary actions.

In public realm projects, eliminating risk entirely would involve restricting all access to spaces, which is often impractical and undesirable. The determination of risk appetite falls primarily to the risk owner, who is responsible for the risks associated with the project, usually the Senior Responsible Officer.

When designing for public realm security, the goal is to **reduce risks to As Low As Reasonably Practicable (ALARP)**. It is important to acknowledge that achieving this level of risk reduction may not always be feasible.

A due diligence approach is essential for assessing issues and implementing security measures. In cases where an effective design solution cannot be reached and risks remain unmitigated, accepting the residual risk may be necessary; however, this requires thorough consideration.

Engagement with key stakeholders will assist in determining risk appetite. For instance, the Council's Public Safety team will be able to point out locations of key concern, and Police Scotland has capacity to provide intelligence on relevant threats.

1.3 Protective Security Design Principles and Measures

The well-considered integration of protective security measures into public realm design is crucial for developing a robust and cost-effective security strategy.

A common approach involves identifying specific threats and implementing a tailored combination of measures, each serving a distinct purpose.

When integrating security measures into the public realm it is essential to consider the following questions:

- **What is the purpose of the measure being considered?**
- **Does this measure effectively mitigate a credible threat?**
- **How will this measure operate?**
- **Does this measure impede intended operational use of the site?**
- **Is the measure compliant with relevant laws, regulations, and standards?**

The following pages outline technical and operational measures for public realm security design**,** detailing their intended purpose, high-level design considerations, and integration recommendations. Measures should be tailored to specific risks to ensure the final design is appropriate for the context.

The National Protective Security Authority's protective security methodology sets out a holistic five step approach to the protection of assets. These principles assist in considering which protective security measures would be commensurate with the threats being faced, to reduce the probability of an incident taking place.

FIGURE 3. PROTECTIVE SECURITY PRINCIPLES (ADAPTED FROM NPSA GUIDANCE)

PHYSICAL MEASURES	▪ Physical security barriers (temporary and permanent) ▪ Hostile Vehicle Mitigation (HVM) measures (temporary and permanent) ▪ Landscape, including street furniture and planting ▪ Carriageway and footway levels
TECHNOLOGICAL MEASURES	▪ Video Surveillance Systems (VSS) ▪ Video analytics and intelligence ▪ Audio analytics ▪ Security lighting ▪ HVM operation systems (applicable to active measures such as pop-up wedge barriers, drop-arm beams or retractable bollards) ▪ Public Address and Voice Alarm (PAVA)
OPERATIONAL MEASURES	▪ Traffic Management ▪ Maintenance operational procedures ▪ Security staff operations ▪ Operational emergency procedures. ▪ Staff training ▪ Operational procedures to deal with security events

TABLE 1. OVERVIEW OF POTENTIAL PUBLIC REALM SECURITY MEASURES

1.3 Protective Security Design Principles and Measures

Tables 2A and 2B are designed to illustrate various security measures mapped to their purposes within a security strategy, along with suggestions for their integration into broader project design and cross-measure collaboration.

An optimal design will incorporate a combination of physical, systems, and operational measures, that mitigate threats by deterring, detecting, delaying, or responding effectively. It is important to note that not all measures will fall within the Council's remit for implementation (such as video analytics and emergency response) but these have been noted for completeness.

PURPOSE	MEASURES	HIGH-LEVEL DESIGN CONSIDERATIONS	INTEGRATION WITH OTHER ELEMENTS
DETER Stop or displace the threat	PHYSICAL SECURITY BARRIERS / HVM	• HVM and barriers can act as a strong deterrent, indicating that carrying out the planned attack will be more challenging. Ensuring that the protected space is clearly demarcated is beneficial.	• Elements of landscaping design such as street furniture, signage and shrubbery can be employed to increase deterrence through visual impact. This needs to be evaluated against the potential impact to accessibility.
	STREET FURNITURE LANDSCAPING / CPTED	• Street furniture should not provide opportunities for concealment and should be easily maintained.	• Consider integration with the rest of the landscape design and HVM, as a visual deterrence but also to enable natural access control through directing pedestrian flow.
	ROAD LAYOUT / SECURITY PATROLS	• Provide opportunity for ease of natural surveillance through street layouts.	• Consider the relationship between active and passive surveillance, how they can support each other to produce complete coverage and ease of response.
DETECT Verify a threat, initiate the response	VSS (Video Surveillance System) VIDEO ANALYTICS AND INTELLIGENCE	• Ensure the VSS design aligns with vulnerabilities identified during the threat & risk assessment stage.	• VSS supported by lighting, requiring design to be holistic. • Natural landscaping, shrubbery, and maintenance to consider impact on VSS. For instance, maintaining trees to ensure height does not block VSS field of view.
	SECURITY LIGHTING	• Ensure lighting scheme does not enable creation of secluded areas. • Ensure lighting enables VSS, does not dazzle or discolour.	• Lighting to support VSS, requiring design to be holistic. • Natural landscaping, shrubbery, and maintenance to consider impact on lighting. For instance, creation of shadows.

TABLE 2A. MAPPING MEASURES TO PURPOSE

1.3 Protective Security Design Principles and Measures

PURPOSE	MEASURES	HIGH-LEVEL DESIGN CONSIDERATIONS	INTEGRATION WITH OTHER ELEMENTS
DELAY Prevent the threat from reaching the asset	PHYSICAL SECURITY BARRIERS / HVM	• Ensure any impact-rated measures align with the output of the VDA (or that residual risk is accepted). • Ensure airgaps between the components of the HVM line is a maximum of 1.2m. • If employing use of impact-rated measures, ensure they are rated to ISO22343 or equivalent.	• HVM and / or barriers implemented should consider their position in the landscape and their orientation and placement regarding road layout. • If using operable measures consideration to be given to how these integrate with electronic systems and / or operational procedures.
	ROAD LAYOUT	• Consider designing road layout to reduce possible vehicle approach speeds where necessary and designing the landscape in line with CPTED principles.	
RESPOND* Apprehend the threat and prevent further progress	PUBLIC SECURITY FORCES (POLICE) PRIVATE SECURITY FORCES SECURITY PATROLS	• When designing the physical security, including HVM, ensure consideration is given to emergency response access requirements. This may include inclusion of removeable bollards in a row of static measures.	• Consideration to be given to where VSS will be monitored and by who, as well as how these system components will be integrated across the city (if required). Consider enabling VSS assessment verification.
MITIGATE Minimise the consequences of a threat	*ALL OF THE ABOVE MEASURES*		

*While mitigation measures such as use of public security forces falls outside of the remit of the Council, a security design should ensure careful consideration of such elements of a security design strategy to ensure it enables effective emergency response rather than hindering it.

TABLE 2B. MAPPING MEASURES TO PURPOSE

1.4 Specialist Security Assessments

Specialist technical assessments are vital for informing protective security design decisions. They help assess credible threats, specify impact-rated vehicle measures, and address other security-related concerns. It is important these assessments be undertaken by a Suitably Qualified Security Specialist, whether internal or external.

Tables 3A and 3B outline a range of potential assessments, expected outputs for the commissioning party, and how these outputs should be utilised in the final design and/or scheme.

RIBA DESIGN STAGE	ASSESSMENT	EXPLANATION	DESIRED OUTPUT(S)	APPLICATION TO DESIGN
RIBA STAGE 2 EQUIV	THREAT, VULNERABILITY AND RISK ASSESSMENTS (TVRA)	The Stage 2 security report may be a TVRA, or other relevant documents equivalent to RIBA Stage 2. The required level of detail and project budget will influence which report is commissioned, but the outputs will remain consistent. The threat assessment may be qualitative or quantitative, providing an evidenced based foundation for implementing site specific mitigation measures if desired.	• Design Basis Threats (DBTs) • Site security vulnerabilities & risks • High-level security design recommendations. *The report should be produced in line with ISO 31000 or equivalent, and NPSA guidance.*	The DBTs provide detail on *credible* site threats, showing which risks need to be considered in the design. Once mapped across vulnerabilities to provide site security risks, this enables the designer to ensure proportionate measures are implemented in a manner that targets reduction of identified risks. It should be noted that any measures recommended within this report are integrated at the client's will and if not considered will likely require acceptance of residual risk.
END OF RIBA STAGE 2 – START OF RIBA STAGE 3	VEHICLE DYNAMICS ASSESSMENT (VDA)	Where the TVRA identifies credible threats such as Vehicle As a Weapon (VAW), Vehicle-Borne Improvised Explosive Device (VBIED), or other vehicle-related security threats, a VDA may be necessary. The VDA requires selection of an appropriate Design Basis Threat Vehicle (DBTV) and identifies routes that the hostile vehicle may take to impact the site. This assessment also determines the maximum speeds and impacts a vehicle can achieve using these routes.	• HVM specification • Where relevant, specific vulnerabilities may be highlighted • Where relevant, areas requiring additional traffic calming measures may be identified. *The report should be produced in line with ISO 22343 (PAS 68 / 69, IWA 14-1 superseded).*	The HVM specification produced in the VDA should be used when selecting impact-rated measures for a site. The report may also be used to inform the HVM design where vulnerabilities have been highlighted that enable vehicle access. A VDA should be used in combination with an associated TVRA, and benefits from development of an Operational Requirements (OR) report and HVM Options Study.

TABLE 3A. PROTECTIVE SECURITY ASSESSMENTS

RIBA DESIGN STAGE	ASSESSMENT	EXPLANATION	DESIRED OUTPUT(S)	APPLICATION TO DESIGN
END OF RIBA STAGE 2 – START OF RUBA STAGE 3	BOMB BLAST ASSESSMENT (BBA)	When explosive related threats and associated risks are identified for a site, a BBA may be requested. The BBA assesses potential vulnerabilities in a building's static structural design when exposed to blast pressures and dynamic loads from DBTs. It evaluates how structural elements respond and determines whether enhancements are needed to minimise hazard to users or the structure. While BBAs are typically associated with buildings, their relevance to public realm projects should not be overlooked.	• Blast mitigation strategy to enhance security, such as considering stand-off distance (a defined distance to reduce adverse impacts) in public realm spaces.	The BBA may impact site design through materials selection, or simply the stand-off between neighbouring structures and the site if there is a responsibility towards reducing displaced threat.
RIBA STAGE 3	OPERATIONAL REQUIREMENTS (OR)	The OR, in line with NPSA guidance [1], builds on recommended mitigations outlined in the TVRA. It outlines the performance specifications for the security measures.	• Developed risk treatment strategy, produced with engagement from all required stakeholders • Desired performance levels of the measures recommended • An understanding of residual risk once mitigations are applied.	The selected security measures can be agreed, and subsequently carried forward into the detailed design stage.
RIBA STAGES 3-4	HOSTILE VEHICLE MITIGATION (HVM) OPTIONS STUDY	A HVM options study may be considered based on the Vehicle Dynamics Assessment (VDA) findings. This study should involve consultation with relevant stakeholders, including the design team, and aims to select HVM measures that meet operational, security and aesthetic requirements.	• An array of HVM options applicable to the site which align with the HVM specifications ascertained in the VDA, and site operational requirements. *The report should be produced in line with ISO 22343 (PAS 68 / 69, IWA 14-1 superseded).*	The options, aligned with the required HVM specifications, can be integrated into the overall landscape design.
RIBA STAGE 4	DETAILED DESIGN	In the Detailed Design Stage, the design team completes the design and produces a detailed specification of each security design element. This includes final specifications and drawings.	• Completed detailed security design accompanied by drawings if required.	The security designs should be incorporated into the project design.

TABLE 3B. PROTECTIVE SECURITY ASSESSMENTS

PART 2: HOSTILE VEHICLE MITIGATION (HVM)

OVERVIEW

The primary purpose of a Hostile Vehicle Mitigation (HVM) solution is to prevent a hostile, unauthorised vehicle from entering a controlled space, thereby protecting individuals within that designated area. HVM is particularly effective against Vehicle as a Weapon (VAW) attacks.

By creating a physical barrier that unauthorised vehicles cannot breach, HVM enforces a safe stand-off distance for vehicle-borne improved explosive devices (VBIED) and can help mitigate issues such as nuisance parking. The implementation and operation of HVM depend on the specific location and context.

While HVM is effective, it can be expensive and may significantly detract from the visual quality or heritage designation of an area if poorly designed. Therefore, it is important to consider the risk(s) specific to the site**. If threats such as VAW or VBIED are not credible based on the assessment, exploring alternative design solutions would be recommended.**

IMPLEMENTING HVM

Collaborating with external security stakeholders, such as local Counter-Terrorism Security Adviser (CTSAs) or security consultants, can provide valuable insights and advocacy for your project. It is recommended to use the Register of Security Engineers and Specialists (RSES) to identify accredited companies within this area of expertise. It is important to gauge the appetite for HVM early in the project, due to associated costs. These costs encompass scheme design, the HVM measures themselves, possible testing, installation, ongoing maintenance and operational expenses. Consider appointing an HVM consultant for the Design and Build using an engineering and construction contract such as NEC4 ECC Option A. An Anti-Terrorism Traffic Regulation Order (ATTRO) will often be required when implementing HVM.

The following pages aim to establish a baseline of information necessary for understanding HVM design and strategy in the development of public realm and major works projects. The information is based on best practice guidance and adheres to relevant testing and manufacturing standards for HVM.

Figure 4 offers a possible approach to HVM selection. To maximise effectiveness, each HVM design should be tailored to the specific site. In order to do so, the VDA (as described in Table 3A) provides site-specific HVM requirements, in that it determines the appropriate rating for the design based on the potential impact of a VAW attack in the area, ensuring the design functions as intended.

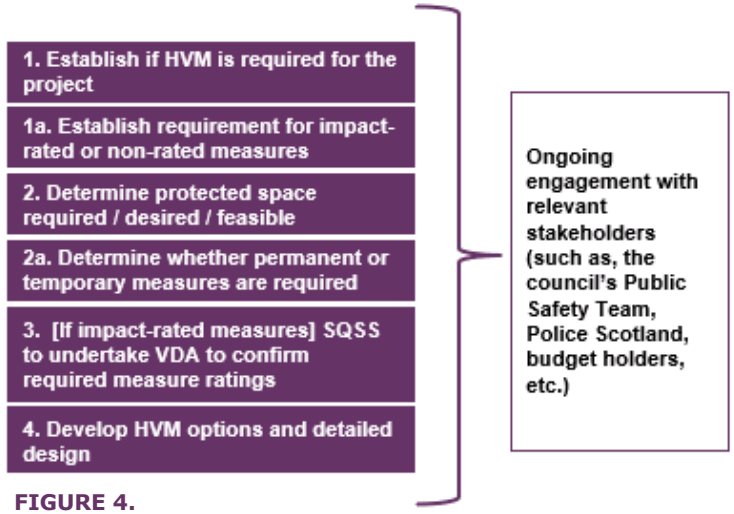


FIGURE 4.
POSSIBLE HVM DESIGN PATHWAY

IMPACT AND/OR DELAY-RATED	▪ When VAW or VBIED has been deemed credible to your site or location ▪ Spaces with significant public presence ▪ Areas in which members of the public are invited to congregate or loiter ▪ Public realm spaces near significant vehicular access routes.
NON-RATED	▪ Where VAW or VBIED have not been assessed as credible in a TVRA ▪ Where natural landscaping inhibits vehicular passage entirely ▪ Where vehicles are excluded by design not just by principle.

TABLE 4.
APPLICATION OF IMPACT-RATED VS. NON-RATED PRODUCTS

2.1 HVM Design Considerations

INTEGRATED APPROACH TO DESIGN

As outlined in Section 1.3, taking an integrated approach to HVM in wider public realm designs is recommended. This should allow measures introduced to respond to and enhance public realm, accessibility and heritage while protecting a site.

This may involve incorporating (non-rated) street furniture, street geometry, or other placemaking features in combination with rated measures – slowing any attacking vehicles before reaching a site, or acting as a visual deterrent. This may also involve use of rated measures themselves as placemaking elements, or elements that serve multiple functions. Rated seating, planters, bins, cycle parking and public art, among other elements, can be provided by HVM suppliers.

RATED VS. NON-RATED

The decision to implement rated versus non-rated measures carries inherit risks and should be informed by a robust understanding of the site and associated threat context, developed in conjunction with key stakeholders.

FIGURE 5. EXAMPLES OF RATED BENCH, BIN AND CYCLE PARKING FROM A HVM SUPPLIER

- **Impact-rated:** engineered and tested to meet predetermined specifications relating to high-speed impact. The NPSA's HVM catalogue, referenced at the end of this document, lists items categorised by their specifications.
- **Delay-rated:** engineered and tested to withstand repetitive ramming for at least 30 seconds. Described as Vehicle Attack Delay Standard (VADS) barriers.
- **Non-rated:** Typically refers to street furniture or design elements intended to create a perception of divided space. They may also involve employing impact-tested measures in ways that have not been formally tested for specific application.

It is important to install impact-tested measures according to the manufacturer's guidelines to maintain their rated effectiveness.

PERMANENT VS. TEMPORARY

- Permanent measures should be considered where regular ongoing protection is likely to be required. These may not always be the most practical or cost-effective solution for providing heightened security for specific events.
- Socketed permanent solutions that can be easily removed may have a higher up-front cost to temporary measures, but can be cost effective over time if similar protection is required regularly on a periodic basis
- Temporary HVM measures are often employed during events or periods of increased security risk. These can be effective for less regular events or events that do not have a fixed location.

STATIC VS. ACTIVE

- **Static**: Static measures are not operable physical barriers. They provide a fixed form of protection and can be useful in creating a secure environment.

- **Active:** Active measures are operable and include telescopic rising bollards, sliding bollards, wedge shaped blockers or gates (sliding / opening or rising barriers). Active measures are beneficial for areas needing frequent vehicle access to ensure ease of entry and exit for authorised users. Drainage must be considered for retractable bollards (e.g. soakaway drainage).

The selection of appropriate active measures should consider the site's security posture, aesthetic preferences, and Electronic Access Control System (EACS) requirements. For cost-efficiency and infrequent vehicle access, consider using removable static measures such as manually removable bollards. There is increased cost associated with systems-operated HVM due to ongoing costs of running and maintaining the systems.

2.1 HVM Design Considerations

HEIGHT & SPACING

To prevent unauthorised vehicle access, maintaining appropriate spacing between Vehicle Security Barriers (VSBs) or other HVM measures is crucial, especially for smaller vehicles. For larger vehicles, the height of the measure is equally important.

Consider the following guidance from the NPSA:

- **The maximum gap between VSBs or other structural elements should be 1200mm**, preventing most 2-axle or larger vehicles from navigating between the measures.
- VSBs should be **a minimum of 500mm above ground level**, with increased height recommended to reduce potential for vehicle ingress.

Measures with increased height are more visible and can enhance the barrier's effectiveness against hostile vehicles. The height of a VSB should be sufficient to prevent the vehicle from mounting it, typically exceeding the chassis of the vehicle.

The Department for Transport's Inclusive Mobility guide recommends a minimum height of **1000mm** for bollards and other freestanding items like raised flower beds. A 1000mm minimum height should be applied on busy footways and where there may be interaction with cyclists.

FIGURE 6. HVM PLANTERS SPACED 1200MM APART, WITH MORE THAN 1000MM HEIGHT

FOUNDATIONS

VSB foundations will vary by product; however, the following overarching factors should be considered:

- The foundation design must be strong enough to resist impact forces generated by the threat vehicle travelling at the final impact speed, without significant deflection.
- Selecting an appropriate approach **requires comprehensive ground investigation** and pre-construction information including **Public Utility drawings, Ground Penetrating Radar surveys and trial pits (vacuum excavation if appropriate)**
- The connection between the VSB and its foundation should be strong enough to prevent brittle shear failure.
- For these measures to work effectively, foundation installation must align with testing conditions.
- Ground bearing conditions vary by site, requiring consideration of VSB performance and potential foundation adjustments.
- Some PAS / IWA certified products tested in softer grounds may require alterations based on site specifics.
- Foundation types can vary from deep to shallow and surface mounted. Shallower foundations generally require a larger footprint, though are more suited to urban environments.
- Project managers should liaise early with public utilities affected by VSBs and obtain agreement in writing

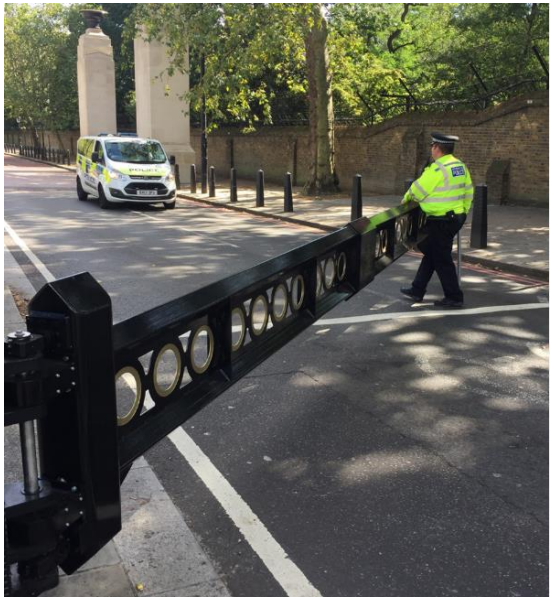


FIGURE 7. 'ACTIVE' (RATED) GATE DEPLOYED AROUND LONDON'S ROYAL PARKS CAN EASILY BE OPENED/CLOSED AND LET VEHICLES THROUGH DURING EVENTS COMPARED TO TEMPORARY MEASURES PREVIOUSLY DEPLOYED

2.2 Heritage and Placemaking

HERITAGE CONSIDERATIONS

Given the UNESCO World Heritage status of Edinburgh's Old and New Towns and considerable number of listed buildings and Conservation Areas, it is essential to integrate security considerations into the heritage and site context, preserving and enhancing the character and appearance of the historic environment where possible.

Traditional security measures can have an adverse impact on the historic environment. Designers should assess the significance of the heritage designation(s) and mitigate/reduce any potential impacts to their cultural significance, which can be demonstrated through a Heritage Impact Assessment, or similar document.

Protection of archaeology will be important in many parts of the city and it is recommended to engage with an archaeologist as early as possible, as late involvement could add delays to delivery timescales.

Depending on the designation of the area (e.g. Conservation Area, Scheduled Monument, in proximity to listed buildings) designs should be considered alongside the relevant stakeholders (Edinburgh World Heritage Trust, Historic Environment Scotland etc). In some cases this may also entail referral to the Planning Authority to determine whether works count as permitted development.

As with all HVM schemes, a successful approach to design involves understanding the use and role of places and designing out the need to employ VSBs where possible. In the Old and New Towns, this approach requires specific sensitivities. Where VSBs are deemed necessary, products should be selected from an approved palette, with a consistent look and feel throughout an area.

PLACEMAKING CONSIDERATIONS

Places that require HVM will also be locations where crowds gather. In these locations, creating people-centred places/landscapes that can be enjoyed should be part of the design ethos. It's important that HVM measures selected don't inhibit the enjoyment of a place, and are integrated into the site context.

Placemaking and HVM, as part of an integrated approach to design, can serve multiple functions and can be more cost effective while reducing excessive street clutter. This could include combining HVM with rain gardens, public art, or street furniture, etc. Relevant guidance should be consulted when doing so e.g. Edinburgh's Public Art Policy and Sustainable Rainwater Management guidance.

'Disguising' VSBs as street furniture or other elements is the council's preferred approach, and should be considered, if possible while still meeting operational and rating requirements of the measures.

FIGURE 8. VSBs 'DISGUISED' INSIDE BOUNDARY WALL WITH RAILINGS AT GREEN PARK, LONDON

FIGURE 9. VSBs INTEGRATED INTO PLANTERS AT SELFRIDGES, LONDON

2.3 Accessibility

ACCESSIBILITY CONSIDERATIONS

Accessibility should be considered carefully when implementing HVM as part of an integrated approach to design. An Integrated Impact Assessment should be completed during the design process, with negative accessibility impacts mitigated where possible.

When considering HVM, especially when using non-rated street furniture in combination with rated measures, a balance should be struck between introducing street clutter and protecting a site. Street clutter should be minimised, while street furniture is carefully sited as part of an integrated approach to HVM.

Recommended spacing of HVM measures (1200mm air gap) aligns with BS8300 required widths for wheelchair access, and should not be reduced below 1200mm. Height and layout of HVM measures should be such that they do not create trip hazards, particularly for visually impaired pedestrians.

HVM measures should have an element of colour contrast to aid detection, particularly by visually impaired pedestrians.

LAYOUT CONSIDERATIONS

The following layout considerations should be discussed with a SQSS to ensure security standards are adhered to, while providing an optimal arrangement for everyday users:

- Arrange barriers in straight lines perpendicular to established pedestrian flow lines to maintain seamless movement for pedestrians.
- Carefully design adjacent features to complement the HVM measures, focusing on visibility and reducing street clutter, to benefit all site users, including those who are visually impaired or neurodiverse.
- While barrier lines at crossing points do not affect typical crossing behaviour, it remains advisable to assess the relationship between HVM lines and tactile paving to ensure accessibility for all users.
- To adhere to security requirements, barriers should be spaced no more than 1200mm apart. For sites with high pedestrian volumes, conducting a pedestrian comfort assessment may provide valuable insights into the implications of such installations.

Studies demonstrate that barriers positioned with a 1200mm airgap have limited impact on pedestrian convenience, and the health and safety of site users [2]. For more detailed guidance on the topic, refer to the links provided at the end of the document.

CYCLE ROUTES

A security assessment should determine whether the cycle route needs to be positioned within an HVM cordon.

It should be noted that the required 1200mm spacing for HVM is narrower than the minimum standard for cycle access at 1500mm.

Designers should therefore take particular care to place HVM measures in such a way that ensures security while safeguarding everyday access for people cycling, with due consideration for people that need to use large or adapted cycles.

Some temporary VSBs restrict or prevent cycle permeability. When selecting approach to HVM, the greatest effort should be made to maintain cycle access where possible.

FIGURE 10. 1200MM HVM AIRGAP ON A CYCLE ROUTE (WESTMINSTER BRIDGE, LONDON)

2.4 HVM Application Examples

There is a wide range of HVM products available, with manufacturers offering bespoke shrouds and finishes to cater for different situational requirements.

The following images provide some examples of HVM installations in the UK, including in heritage and UNESCO World Heritage locations.

WHITEHALL, LONDON
GOOGLE MAPS

THE OLD ROYAL NAVAL COLLEGE, GREENWICH LONDON (UNESCO WORLD HERITAGE)
FRONTIER PITTS

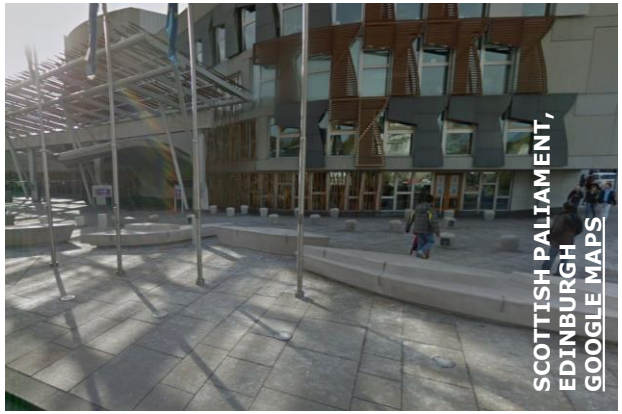
ST PANCRAS, LONDON
ATG ACCESS

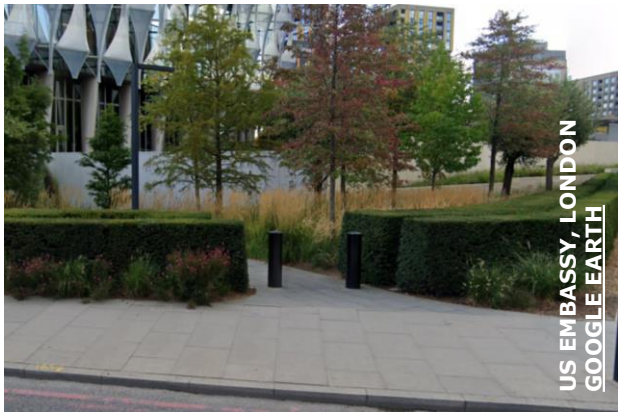
TRAFALGAR SQUARE, LONDON
GOOGLE MAPS

WESTMINSTER BRIDGE, LONDON
GOOGLE MAPS

TEMPORARY HVM – EDINBURGH (UNESCO WORLD HERITAGE)
CROWDGUARD

INTEGRATED LANDSCAPING / STREET FURNITURE HVM


SCOTTISH PALIAMENT, EDINBURGH GOOGLE MAPS

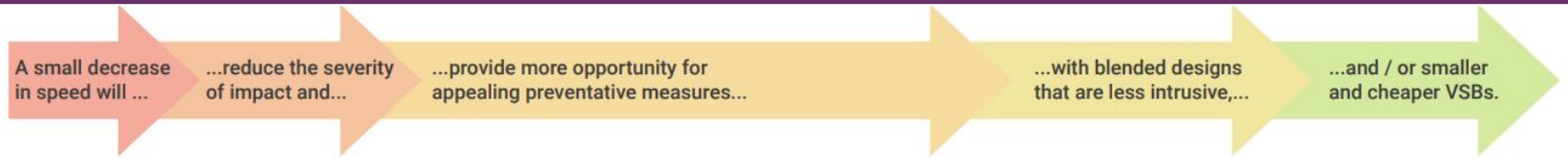

US EMBASSY, LONDON GOOGLE EARTH

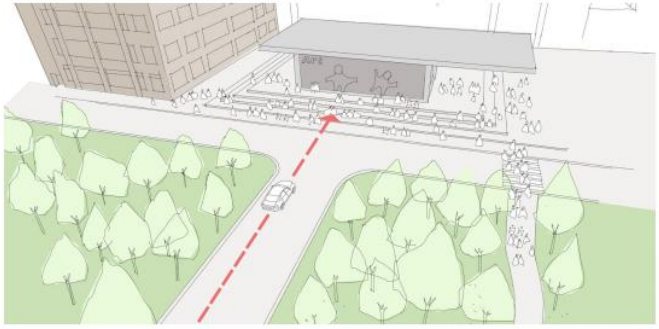

TODD STREET, MANCHESTER TOWNSCAPE


STRAND, LONDON GOOGLE MAPS

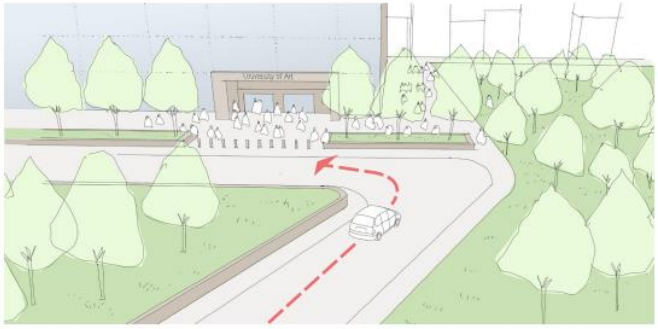

YORK MINSTER TOWNSCAPE

EMIRATES STADIUM, LONDON GOOGLE MAPS

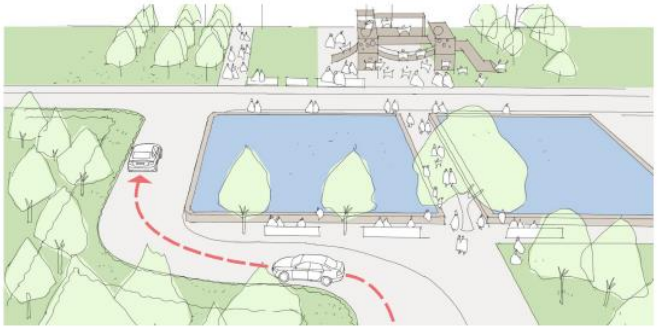




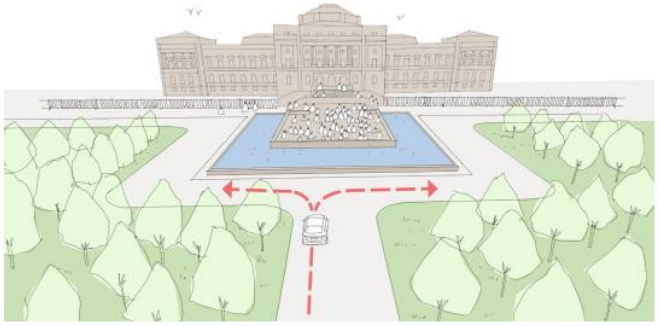
A direct approach route towards the target allows a hostile vehicle to build up speed on approach.



Moving a road or relocating a vulnerable location or asset, to create an indirect approach, will reduce the opportunity for a hostile vehicle.



Chicanes and offset approaches reduce hostile vehicle approach speed.



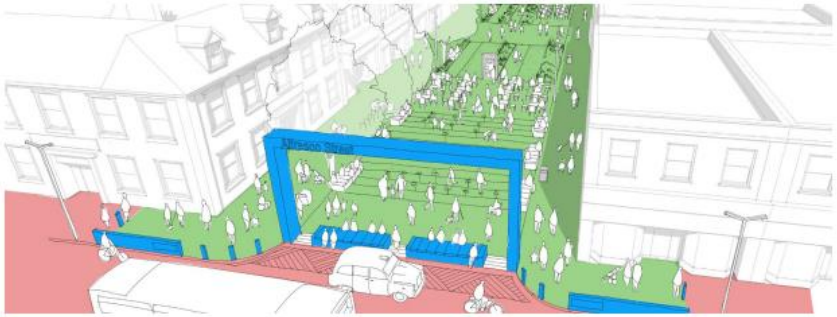
Removing vehicle access removes the potential for using a vehicle as a weapon and establishes a stand-off distance from parked hostile vehicles.

EXAMPLES OF LANDSCAPE ALTERATION TO REDUCE VEHICLE IMPACT

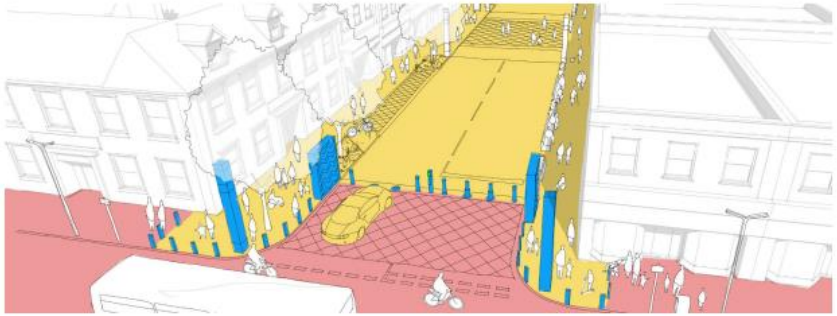
Extract from: NPSA, *Public Realm Design Guide for Hostile Vehicle Mitigation,* pp.40-41 [3]

No protection Reduced protection Full protection HVM

The following traffic management options can be utilised:

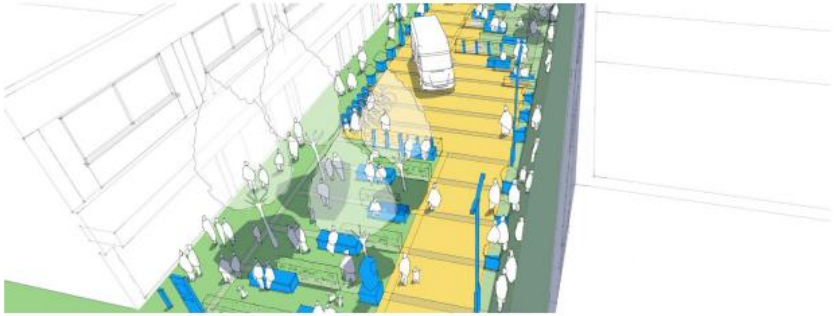


(a) Vehicle exclusion - In certain situations total vehicle exclusion enforced by Vehicle Security Barriers (VSBs) may be appropriate.



(b) Vehicle inclusion - In other instances, controlled access for authorised vehicles such as emergency services, utilities, deliveries, buses, residents and Blue Badge holders may need to be accommodated through a Vehicle Access Control Point (VACP) and should be carefully managed to avoid being defeated by hostiles.

(c) Temporary protection - Temporary or redeployable Vehicle Security Barriers (VSBs) may be employed at times of heightened threat or pre-planned special events. These barriers require specialist equipment to deploy, tend to be more visually intrusive and less permeable for pedestrians than permanent solutions.



(d) Traffic calming methods - The application of horizontal deflections (e.g. bends and chicanes) that are enforced by VSBs will limit hostile vehicle speeds. Reducing hostile vehicle speeds significantly reduces the severity of a vehicle-borne attack with fewer casualties in a VAW attack on people and less damage from a penetrative vehicle impact on other assets. Reducing vehicle speeds can reduce the requirements and associated costs of HVM measures and provide more opportunities to deploy discreetly integrated protection.

TRAFFIC MANAGEMENT AND HVM DESIGN OPTIONS

Extract from: NPSA, *Public Realm Design Guide for Hostile Vehicle Mitigation,* pp.38-39 [3]

Technical Glossary

Throughout this document, several key security terms and acronyms are used, as defined below.

TERM: Definitions
THREAT: A source of potential harm. A factor or event which could potentially cause the loss of, or damage to, assets and people.
DESIGN BASIS THREAT (DBT): Threats that have been deemed credible to a site / event / facility through use of a threat assessment.
VULNERABILITY: A weakness or flaw in a system or process that could conceivably be exploited by a threat.
RISK: A potential event that carries foreseeable consequences for assets and impacts on operations / success criteria.
RISK OWNER: An individual or group accountable for understanding and managing risks to a site / project.
RESIDUAL RISK: The risk of loss or harm that remains once mitigation measures have been put in place.
HISTORIC ENVIRONMENT: the physical evidence of past human activity, connecting people with place, and the traditions, stories and memories linked to those places.

ACRONYM: Definitions	
ALARP: As Low As Reasonably Practicable	**OR:** Operational Requirements
ATTRO: Anti-Terrorism Traffic Regulation Order	**PAL:** Publicly Accessible Location
BBA: Bomb Blast Assessment	**PAVA:** Public Address and Voice Alarm
CCTV: Closed-Circuit Television	**RIBA:** Royal Institute of British Architects
CPTED: Crime Prevention Through Environmental Design	**RSES:** Register of Security Engineers and Specialists
CSyP: Chartered Security Professional	**SQSS:** Suitably Qualified Security Specialist
CTSA: Counter-Terrorism Security Adviser	**TRO:** Traffic Regulation Order
DBT: Design Basis Threat	**TVRA:** Threat, Vulnerability and Risk Assessment
DBTV: Design Basis Threat Vehicle	**VAW:** Vehicle As a Weapon
DfT: Department for Transport	**VBIED:** Vehicle-Borne Improvised Explosive Device
DOCO: Designing Out Crime Officer	**VDA:** Vehicle Dynamics Assessment
EACS: Electronic Access Control System	**VSB:** Vehicle Security Barrier
EWH: Edinburgh World Heritage	**VSS:** Video Surveillance System
HVM: Hostile Vehicle Mitigation	
NPSA: National Protective Security Authority	

Relevant Resources

ONLINE RESOURCES

NATIONAL PROTECTIVE SECURITY AUTHORITY (NPSA)

- Public Realm Design Guide - Public Realm Design for Hostile Vehicle Mitigation | NPSA
- Catalogue of Security Equipment - The Catalogue of Security Equipment | NPSA
- HVM Catalogue - HVM - Impact Rated | NPSA
- Risk Management - Protective Security Risk Management PSRM | NPSA
- Specialised guidance: Anti-Terrorism Traffic Regulation Order

OTHER

- Home Office - Terrorism (Protection of Premises) Act: Overarching factsheet
- Home Office – Counter-Terrorism and Border Security Act 2019: Traffic Regulation factsheet
- Protecting Publicly Accessible Locations - Physical security | ProtectUK
- RIBA Security Overlay - Security Overlay to the RIBA Plan of Work (architecture.com)
- Secured Environments - Principles (securedenvironments.com)
- Transport for London, Pedestrian Comfort Guidance for London - Pedestrian Comfort Guidance for London (tfl.gov.uk)
- DfT & NPSA, The Influence of Bollards on Pedestrian Evacuation Flow - The influence of bollards on pedestrian evacuation flow: traffic advisory leaflet 01/16 (publishing.service.gov.uk)
- DfT & NPSA, Vehicle Security Barriers within the Streetscape - Vehicle security barriers within the streetscape: traffic advisory leaflet 1/11 (publishing.service.gov.uk)
- DfT, Inclusive Mobility: A guide to best practice on Access to Pedestrian and Transport Infrastructure
- City of Edinburgh Council, Public Art Policy
- City of Edinburgh Council, Sustainable Rainwater Management guidance

RELEVANT STANDARDS

- ISO 31000 – Risk Management
- ISO 22343 - Security and resilience, Vehicle security barriers

SUITABLY QUALIFIED SECURITY SPECIALIST (SQSS) – BREEAM

Minimum of three years' experience in a relevant security profession (in the last five years). This experience must clearly demonstrate a practical understanding of factors affecting security in relation to construction and the built environment, relevant to the type and scale of the project being undertaken.

1. Holds a qualification relevant to security.
2. Maintains a full membership to a relevant professional body, institute or certification scheme that has a professional code of conduct, to which members adhere.

The following licensing/registration schemes are recognised as meeting the requirements of criterion 2 and as such, individuals listed are also eligible to perform the role of SQSS:

- Chartered Security Professionals (CSyP)
- Register of Security Engineers and Specialists (RSES) 'General Security Advisor' (GSA) or 'Hostile Vehicle Mitigation Advisor'.

References

External Document References

[1] NPSA, *Operational Requirements Guidance,* 2018 - Operational Requirements Guidance (npsa.gov.uk)

[2] Department for Transport (DfT) & NPSA, *Traffic Advisory Leaflet 2/13 – Bollards and Pedestrian Movement,* 2017 - Traffic Advisory Leaflet 2/13 (publishing.service.gov.uk)

[3] NPSA, *Public Realm Design Guide for Hostile Vehicle Mitigation,* 2023 - Public Realm Design for Hostile Vehicle Mitigation | NPSA

[4] BREEAM, *SQSS – Individuals Recognised*, 2021 - SQSS – Individuals Recognised – Knowledge Base (breeam.com)

Table References

Image References