



GCDN

Commissioned Research

Beyond Concrete Barriers

Innovation in Urban Furniture and Security in Public Space

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GCDN

Global Cultural
Districts Network

An Initiative of AEA Consulting

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Foreword

THE GLOBAL CULTURAL DISTRICTS NETWORK (GCDN) is a network of global centers of arts and culture that fosters cooperation and knowledge-sharing among those responsible for conceiving, funding, building, and operating cultural districts. Founded in 2013 by AEA Consulting, members include cultural institutions, non-profit and private organizations, as well as city-level governments from Australia, Canada, China, Europe, New Zealand, Singapore, the United Arab Emirates, and the United States. The Network connects the leadership of organizations in the public, private and non-profit sectors who are responsible for planning and managing cultural districts or precincts — or any areas with a significant concentration of cultural activities — through convenings, research, and collaborations. It also provides a context for cultural leaders to discuss and share emerging practice across a range of issues related to the successful creation and management of cultural districts.

A fundamental responsibility and concern of many members is *public safety*, both in the context of events and more generally. Following the rise in terror attacks around the globe — specifically those involving fatal vehicular attacks on public spaces, many of which have affected GCDN member organizations — our members have placed the complex cluster of issues to which public safety today gives rise high on the agenda. This research brief addresses one aspect: the role of urban design.

Safety is a fundamental, if often unspoken, premise of successful placemaking, informing both the design and programming of public spaces. More and more placemaking efforts are focused on the creation or revitalization of public spaces, often in downtown areas involving heavy foot and vehicle traffic. For these projects to be successful, it is critical that the design, technology and security oversight be effective but also recessive, requiring imagination and intelligence to be applied to the design process from the start. Managers of cultural districts, Business Improvement Districts, and other public spaces are seeking innovative solutions for securing their public spaces in ways that retain the beauty and attraction of these areas.

Whilst public safety is a constant, the circumstances and contexts are always changing. In recent years, the frequency, complexity, and impact of terror attacks in public spaces have increased the need to address how the design of public spaces can help reduce the risk of, or minimize, the overall impact of, vehicular attacks. One dimension is the effective segregation and protection of pedestrians and groups. Street furniture is being designed to serve the purpose of protection whilst adding an aesthetic or functional dimension to public space beyond its role in safety.

Initiated by the *Quartier des Spectacles* Partnership in Montreal, GCDN commissioned this study to identify good practice with respect to the use of street furniture for safety in public space, uncovering where this has been done most effectively, and giving an account of the way in which the furniture operates *in situ*; the design process; and lessons learned since its installation, together with a brief account of how it has served its purpose from the user's perspective.

The report features case studies and technical specification sheets, with in-depth analysis of innovative examples of urban furniture to tell the story of how various operating entities are thinking about the use of urban furniture for these security purposes, the development, manufacturing, and installation of the furniture, and the intended outcomes of their deployment.

We would like to thank our GCDN members and the research team: Professor Jon Coaffee of the University of Warwick and Judith Portier, Myriam Peixeiro, and Émilie Cormier of Design par Judith Portier.

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About GCDN

An initiative of AEA Consulting, the GCDN is a membership-based network that fosters cooperation and knowledge-sharing among those responsible for planning and running districts and clusters that include a significant cultural element.

Founded in 2013, GCDN provides a context for cultural leaders to discuss emerging best practice across a range of issues related to the successful creation and management of cultural districts and cultural planning around the world.

For more information visit:

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About the Research Team

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Design par Judith Portier Inc.

Design par Judith Portier Inc. is an environmental design studio mandated to develop urban and other spaces in a sustainable or temporary way to create gathering spaces and broadcast content. Services offered include: artistic direction, development of event and festival sites, kiosks and temporary spaces, exhibition and information design, installations in public places and commercial development. Our work of design, manufacturing and installation integrates the design of objects, furniture and constructions on a larger scale. Our design experience in the public space allows us to quickly identify the issues surrounding our interventions and to provide the right solutions in collaboration with our clients. The interaction between space and its users is at the heart of our approach.

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Introduction

by Jon Coaffee

PUBLIC SAFETY HAS ALWAYS BEEN a fundamental premise of successful public spaces, and the design, management and programming of public spaces require it to be a material consideration in planning and public realm improvement processes. Especially since the events of 9/11 2001, the threat of urban terrorism has necessitated that the owners and managers of public spaces consider installing or retrofitting protective security features, possibly in the form of street furniture, in order to mitigate the impact of terror attack against “soft targets” that are relatively open to attack due to their easy accessibility and high crowd density.

Most recently, attacks in Berlin, Nice, Stockholm, London, New York, Melbourne, and elsewhere using fast moving vehicles against crowded public spaces have led to a re-evaluation of security in many public locations and cultural districts. Whilst this study focuses specifically on the challenges of responding to vehicular attacks, we should acknowledge that urban security challenges are numerous — for example *how do the public and private sectors best respond to marauding knife or gun attacks, how do they respond to Las Vegas-type ‘sniper’ incidents, and what are the future threats they should be prepared for?* A wide-ranging, integrated and adaptable public realm security approach should be adopted where possible to reduce the likelihood of such attacks occurring and mitigate the impact of them if they do.

For limiting the occurrence and impact of vehicle attacks against crowds in public locations, urban designers and security experts have, to date, primarily put in place measures that reduce vehicular access to public spaces, as well as seek to maximize the “standoff” distance between the road and “target” locations. Most common amongst such initiated public realm interventions have been ‘barrier’ methods of protective security, notably crash-rated security barriers, steel bollards, or simple temporary concrete or wooden blocks, all of which are intended to limit access by vehicles seeking to attack crowded public places.



Perpignan, France, 2017.
Image courtesy of Jon Coaffee.

However, such an approach to securing the public realm is seen by many as ‘disproportionate’ as it impacts significantly the livability, walkability, character, and accessibility of public spaces. For some, such hyper-security risks create “sterile” public spaces where the general public fear to tread. Protective security in this sense does not provide feelings of safety and security and indeed can have the opposite effect — and be viewed as an “architecture of paranoia.”



Birmingham UK, 2016.
Image courtesy of Jon Coaffee.

Until recently, the security techniques that have traditionally been applied to public spaces have largely been based on policing or military-style approaches that seek to secure access to risky locations through robust physical interventions. Often such approaches are similar to commonly understood planning techniques such as “Secured by Design” or “Crime Prevention through Environmental Design”. These concepts are implemented by use of security cordons, barriers, and enhanced surveillance to seek to make spaces safer through the manipulation of the built environment in ways that reduce the attractiveness and physical access to possible targets. In practice, and faced with an escalating threat of urban terrorism, this has meant the mass use of security barriers, bollards, and high-visibility policing.

Re-designing for new terror threats

Whilst public safety is a constant requirement in public places, the circumstances and contexts are always changing; notably terror groups are increasingly targeting crowded places that cannot be altered without radically changing how we experience our cities. *Is it possible, then, to put in place effective counter-terrorism measures without upending how we use and feel about our urban centers?* Whilst ongoing urban revitalization and cultural renaissance has increasingly emphasized inclusivity, livability, and accessibility, these “quality of life” values often sit uneasily beside concerns to “design-out” terrorism, as security becomes an integral part of the design process.

In recent years, the frequency, complexity, and death-toll of terror attacks using vehicles to target public spaces have increased the need for the use of specialized street furniture — not just security bollards — that can help reduce the risk of these atrocities in ways that balance the effectiveness of intervention measures with their acceptability by users of those spaces. According to The Risk Advisory Group, in 2016, vehicular attacks accounted for the largest number of terrorism casualties in the West, resulting in 601 deaths.

After recent tragic instances of vehicle-based terror attacks hitting Western capitals, cities have once again looked to bollards and barriers for protection. In many locations, these have been literally “thrown” around key sites to stop further vehicle attacks or to reassure the public that the threat of terrorism is being taken seriously. But how do we prevent accessible public spaces from turning into ones of eternal vigilance? How does subtler landscape alteration and the innovative use of street furniture become the go-to option rather than swathes of obtrusive security features that litter the landscape?

There are important measures cities and the owners and operators of public spaces can take in their design plans to help avert this growing trend of terrorist attack and to mitigate the damage done in the event they do take place. In reimagining such a public realm improvement process, where possible, the design, technology, and security oversight should be as recessive and un-intrusive as possible. This requires innovative thinking to be applied to the design process. For example, can street furniture provide additional benefits (co-benefits) and be designed to serve the purpose of protection, whilst adding an aesthetic or functional dimension to public space beyond its role in safety? Can this provide the effective segregation and protection of pedestrians and groups from vehicular intrusion, whether intentional or accidental? And, importantly, what are the experiences of how such street furniture operates in situ and in relation to the other functions of public spaces and cultural districts?

The predominant view that is emerging is that security features should, where appropriate, be as unobtrusive as possible. In some locations, this has led to security features that are increasingly camouflaged and subtly embedded within the cityscape, although in many cases barrier and bollard-type solutions still prevail as a default response. Examples of such “stealthy” features include balustrades or artwork erected as part of public realm improvements or hardened benches, lampposts or other streetscape elements that still provide a “hostile vehicle mitigation” functionality, with designs capable of stopping a seven-ton truck traveling at 50 miles per hour.



Emirates Stadium, London. Image courtesy of Jon Coaffee.

In some cases, the use of specific types of trees can also be used in place of crash-rated bollards to provide protection. In response to rising threat levels, Copenhagen is aiming to first decorate security barriers and eventually replace them altogether with trees and benches. Similar decoration of barriers and bollards has also become more widespread in a number of cities as a way of demonstrating against the imposition of security ‘eyesores’.

Subtler design alterations can also reduce the speed of vehicles traveling to a target location. Small bends or turns in roads approaching crowded locations have often been used as a way to limit the speed at which a vehicle attack can be launched, hence reducing potential damage. After recent vehicle attacks, alternatives to bollards are being contemplated as part of a desire to maintain an open city.



Edinburgh barriers, 2017.
Image courtesy of Jon Coaffee.



Protective balustrades in Whitehall,
London, 2017.
Image courtesy of Jon Coaffee.

There is greater engagement in a number of cities with the artistic and cultural community with regard to designing alternative security interventions that reduce the appearance of security whilst keeping the city as open and accessible as possible.

In response to such challenges, a number of cities — notably in the UK, the US, Europe, Australia, and Abu Dhabi in the UAE — have now advanced strategic guidance on how the owners and operators of public spaces can respond to the latest wave of vehicle-borne terror attacks against crowded locations. This has been done through embedding security into design plans in ways that reflect upon and turn threat information into effective, protective security measures that are considered at the earliest opportunity within a design process, and which are proportionate with the level of risk faced. In many countries, standards and regulations are being advanced to encourage appropriate security design and a range of less-well tested security products are also available. The anticipated need for security design also

highlights that counter-terrorism is a task that requires the integrated input of a range of stakeholders who design, manage, secure and use public places and who work together to protect the public realm from vehicular attacks.

What kind of public space do we want to live in?

How our public places are designed tells us a lot about the type of society we are and the type of society we would like to be. In this sense, providing prescriptive guidelines on protecting against terrorism in public places is a difficult task, especially in societies that value freedom of movement and expression but are seen as under threat of attack. More broadly, counter-terrorism measures deployed in public places must seek to balance security effectiveness with social and political acceptability. We live in dangerous times; but how we react to the risk of terrorism has an impact on our public realm and civic sense for many years, as Donald Trump's outspoken comments on terrorist acts in London and New York, and his muted response to the Las Vegas shooting — and the ensuing reactions — underscored. In many ways, the threat to cities comes as much from our policy responses to such risks as the actual act of terrorism. Both have the potential to harm the freedom of movement and expression that define a vibrant city.

If we want a humane and accessible public realm and a genuinely open society, we should not let exceptional security measures become the norm as we seek more adaptable and effective ways of coping, in a calm and measured way, with urban terrorism. Put simply, bollards are not enough. We need to think innovatively about how we can secure public spaces effectively whilst retaining the essential characteristics that make them accessible, friendly, walkable, and welcoming places that are attractive, sustainable, and safe.

The following sections of this document illustrate — through a range of diverse case studies or design vignettes — the implementation of counter-terrorist security features in public places. These examples illuminate the trade-offs that a range of urban professionals have to make when seeking effective and appropriate security design in situ. This document also includes a range of examples and specific photographic insights into what exists and what is being planned around the world for urban furniture and security in public space.

Case Studies

Case Study 1

United States: Times Square, New York City — Integrated Security Design

Why: Context and requirement

Immediately after the events of September 11, 2001, iconic locations in Manhattan have been subject to security design due to fears of attack. Initially, this was most noticeable around the Stock Exchange/Wall Street district where an integrated security scheme was designed. Here, temporary bollards/jersey barriers were replaced with bronze 'no-go' barriers, and, where vehicular access was required, crash-rated bollards were placed atop turntables.

More recently, and in response to heightened threat levels, other public locations have been subject to design interventions to enhance security. For example, Times Square — one of the densest and most visited public areas in the United States — has been transformed from a congested vehicular space to a largely pedestrianized location in the name of enhancing security. The Times Square area, through the Times Square Alliance has also embedded security in its redesign of the public realm in order to replace the usual large blocks of concrete. The new design scheme was in part driven by security advice received in 2012 and 2013 that noted concerns about users of this recreational space being protected from vehicles used either accidentally or intentionally against them. The threat was seen to come from a number of sources: drunken drivers, drivers who lost control of their vehicles for other reasons, terrorists who planned to drive into crowds (al Qaeda propaganda had called for such attacks), and would-be bombers who could leave car bombs in the Square (as they did in 2010).

Through the use of strategically placed and crash-rated steel bollards and granite benches, the area has, as much as possible, attempted to limit the opportunity for vehicle attacks, whilst not detracting from the vibrancy of the area. The bollards and barriers are an integral part of the ambitious improvement project that has attempted to make permanent the pedestrianized landscaping in and around Times Square. This included the closure of Broadway to vehicles in May 2009, and the creation of pedestrian streets (the first section of which opened in 2014).

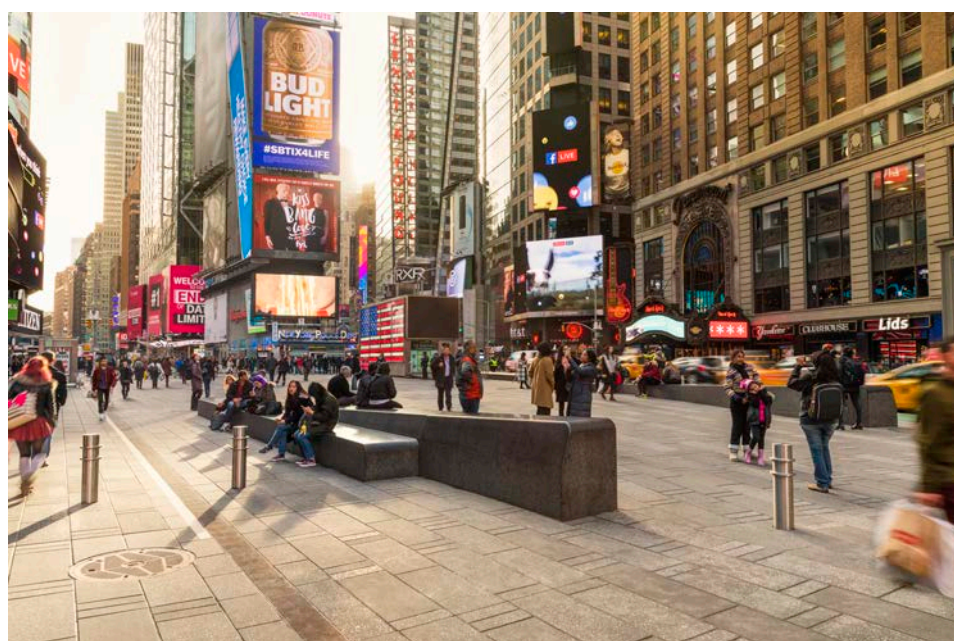


Image credit: Michael Grimm for the Times Square Alliance.

How: Implementation and design process

Due to the high traffic and heavy pedestrian presence in Times Square, there were many safety and security requirements that had to be met during the design and manufacturing stage of the project. Two main elements were agreed upon in a new security plan in January 2013 that combined to make Times Square more secure from vehicle attacks: bollards and granite seating.

As noted in the media¹, Times Square was to get 'Belts of Steel and Granite'. For Snøhetta, designers of the new public plaza, the security functionality of the plaza was to be integrated as far as possible into the overall design:

Our method has been to protect the plaza areas while also using design elements that don't overwhelm the public experience. We wanted to be sure safety measures did not define the public space while also creating highly effective protective features in the most populated areas. Bollards, in connection with other integrated security features, form the basis of the security design for the plaza. These elements allow for fluid and intuitive circulation between the plazas. This was a fundamental concept of the redesign as a whole, which focused on reducing visual and physical clutter and confusion in the Square, creating a simplified surface that allows people to move comfortably and naturally through the space.²

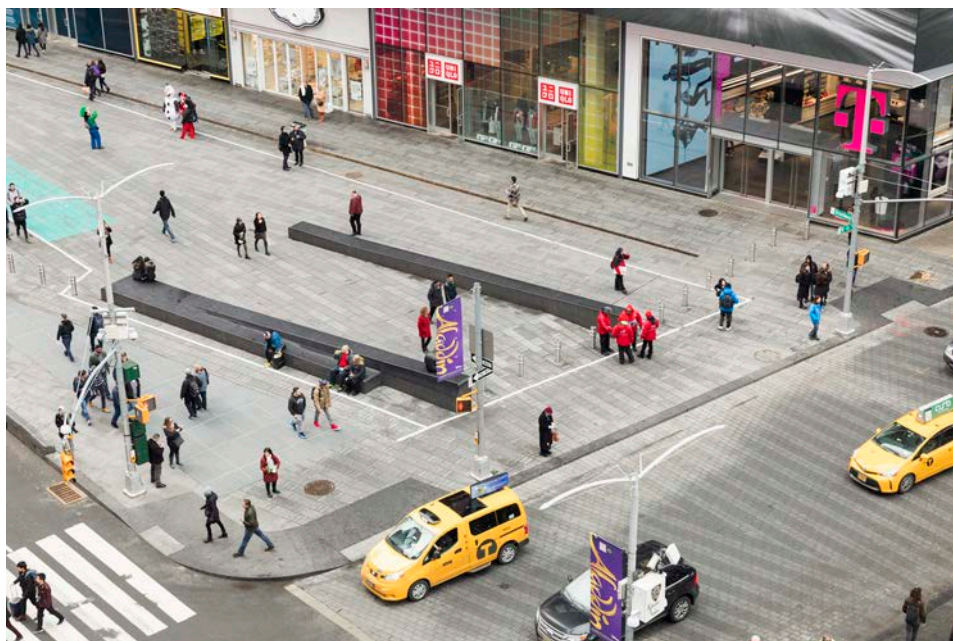


Image credit: Michael Grimm for the Times Square Alliance.

Bollards designed by Rogers Marvel Architects and produced by Calpipe were installed. Design requirements meant that the bollards had to be removable and lockable so that authorized vehicles could access the protected area. In consideration of the large crowds at a location like Times Square, the bollards were also designed to be tamper-resistant. They also had to be shallow-mounted so that they would not conflict with NYC's subway system, which sits only feet below the surface. The 200+ bollards are also designed to blend in with other stainless-steel elements in the wider landscaping plan.

In addition to the fixed, but removable, security bollards, ten, fifteen-meter long granite benches that act as hostile vehicle mitigation barriers have been oriented along Broadway to define and frame the area's public plazas. According to their designers "These benches will act as a magnet for visitors, create an infrastructural spine for events, and provide a clear orientation device for tourists and locals alike."³

- 1 See New York Times, January 13, 2013: <https://cityroom.blogs.nytimes.com/2013/01/13/times-square-bow-tie-is-to-get-a-belt-of-steel-and-granite/>
- 2 See Architect's Newspaper, May 19, 2017 : <https://archpaper.com/2017/05/snohetta-times-square-car/>
- 3 See Snøhetta Press Release, April 19, 2017: <https://snohetta.com/news/362-snohetta-celebrates-opening-of-times-square-redesign>

Outcome: Usage and evaluation

The Times Square Alliance, which runs the local business improvement district and commissioned the plan, noted in 2013 at the start of the security masterplan construction phase, that the proposals sought to balance reasonable protection with keeping the city’s most symbolic and visible public space both open and appealing. The Alliance sought to move beyond the imposition of too many ‘ugly’ concrete barriers, and embed security in more innovative ways within the streetscape as part of wider landscaping plans. Whilst the overall scheme decided upon was relatively high-cost, it has provided assurance to businesses and those frequenting the Square that safety and security are being taken seriously.

In recent surveys, over 80% of visitors now agree that the pedestrian plaza makes Times Square feel safer. In addition, pedestrian injuries have decreased by 40%, vehicular accidents have decreased by 15%, and overall crime in the area decreased 20%. And with the removal of vehicles, air pollution in the Bowtie area has fallen by as much as 60%, making the space safer and healthier for everyone. In addition to the benefits to public health and safety, surveys show that New York residents, Times Square employees and tourists all feel that the pedestrian plaza improves the Times Square experience, making it a more pleasant place to be and creating a unique atmosphere that was not there before⁴.

Total security cannot, however, be guaranteed. Following a car crash in Times Square in April 2017 that killed one person and injured dozens of others before being stopped by newly installed security bollards, a reappraisal of security has been ongoing to further enhance pedestrian safety measures at one of America’s busiest landmarks. Such reappraisal is also being catalyzed by the vehicle attack in New York in October 2017, in which a rental truck was driven down a bikeway, killing 8 people and injuring 11 others. As a result of this attack, hundreds of concrete blockers have been placed along the length of the entire bike path as well as in other locations. In early 2018, New York Mayor de Blasio, symbolically standing in Times Square, announced plans for over 1,500 permanent security bollards to be installed across the five boroughs to protect popular public spaces, at a cost of over \$150 million. He also noted that the city has taken steps to make sure that the bollards “integrate into the life of the city.”⁵

	Low	Medium	High
Security effectiveness			✓
Design integration		✓	
Cost			✓

4 See Snøhetta Press Release, April 19, 2017: <https://snohetta.com/news/362-snohetta-celebrates-opening-of-times-square-redesign>
5 <http://www1.nyc.gov/office-of-the-mayor/news/003-18/mayor-de-blasio-extensive-plan-install-security-bollards-protect-new-yorkers-#/0>

Case Study 2

United Kingdom: Cardiff City Center — Public Realm Improvements

Why: Context and requirement

In 2009, Cardiff City Council began to plan a major development scheme to help boost shopping facilities and tourism in the city. The scheme focused around the redevelopment and extension of the St David's shopping center in the central city in order to create an internationally renowned shopping, leisure, cultural and tourist destination.

Improving the function, character, and quality of the public spaces and bringing a cosmopolitan look and feel to the city center was central within the redevelopment efforts. In line with the UK national strategy of encouraging urban planners and designers to consider designing in counter-terrorism features to vulnerable and high profile crowded locations, the planning and design team at Cardiff city council also consulted with experts with regard to how security could be blended into the public realm improvements under the guise of regeneration and renewal efforts.

The company Marshalls was employed to assess physical security requirements and the council was advised to introduce security standards throughout the city, to provide adequate protection against potential vehicle-borne terrorist attacks (to meet British standards with products capable of resisting an impact from a 7.5 ton lorry traveling at 50 mph).



Images courtesy of Marshalls.

How: Implementation and design process

The selected security scheme for St David shopping center included eighteen 50-liter capacity 'planters' around the development. Subsequently, a bespoke solution was designed that would not only allow tree planting by accommodating the root ball of a tree, but also coordinate visually with other temporary planters already located in the city center.

In addition to the large planters, other street furniture was added in the form of seating which was installed in between the planters. Bench-type seating was made from robust and durable materials (steel and hardwood) and in the words of the designers, "reflects the best of modern urban design: simplicity, sustainable, and robust materials in a low-profile form. [It] is contemporary, yet its simple discreet unobtrusive lines make it equally suited to both historical and modern settings". Reinforced cast stone benches/seats were also put in place to provide occasional seating. According to the designers these granite blocks are both attractive,

minimalist and effective as a security product: “With the utilitarian attributes of an occasional seat, this is not a bench; it not a design. It is a landmark that distils its reminiscence of an altar or a sarcophagus, while its height, material and situation lets you rest just as you would on a tree trunk or in a doorway, for a while, without expecting great comfort.”⁶



Images courtesy of Marshalls.

Outcome: Usage and evaluation

The security design scheme utilizing street furniture put in place in and around St David’s shopping center to protect a critical site in the city provided an innovative solution to the counter-terrorism requirements and in particular vehicle-as-weapon-attacks. The integrated scheme utilized a range of street furniture products tested to British standards (so-called PAS 68) and remains sympathetic to the historic architecture of the surrounding area. Its use of trees (in planters) and seating areas create an attractive yet secure public space that is both effective and visually attractive.

More broadly the scheme is emblematic of how Cardiff City Council has embraced the need to design-in counter-terrorism without resorting to a bollards-first approach. It has successfully integrated security into Cardiff’s public realm, safeguarding against vehicle attacks without sacrificing design quality. Such approaches have now been mainstreamed across Cardiff and are reflected in the city’s recently updated public realm design manual.

	Low	Medium	High
Security effectiveness			✓
Design integration		✓	
Cost		✓	

6 See Marshalls Case Study — St David’s, Cardiff City Centre: <https://www.externalworksinindex.co.uk/entry/113935/Marshalls-street-furniture/Decorative-and-terrorist-protection-planters-Cardiff/> and https://cms.esi.info/Media/documents/550092_1366209035986.pdf

Case Study 3

Australia: Federation Square, Melbourne — A Dedicated Ring of Steel

Why: Context and requirement

In recent years, the threat of terrorist attack against high profile cultural locations in Australian cities, such as Federation Square in Melbourne, has pushed leading public authorities and the private sector to explore preventative measures to reduce the likelihood of a successful strike. Particular concern has been expressed about so-called 'vehicle as weapon' attacks with temporary security measures being deployed in an ad-hoc fashion and plans advanced for a more integrated security and public realm schemes in a number of locations.

Federation or 'Fed' Square is a modern piazza that has become the heart and soul of Melbourne and has subsequently become a key target of terrorism. It is home to major cultural attractions, world-class events, tourism experiences and retail stores. Since its opening in 2002, Fed square has welcomed more than 100 million visitors and is recognized internationally as a contemporary world site and Melbourne's inspirational public space showcasing its civic and cultural strengths.

In Federation Square, security plans have been rapidly developed given recent security events in the locality. For example, in January 2017, six pedestrians were killed in Bourke Street after a car was driven at high speed through the CBD. Other potential attacks against the Square have been thwarted by security services.

The planned security interventions also follow hot on the heels of Australian National Government advice on the protection of crowded places from terrorism that aims to 'protect the lives of people working in, using, and visiting crowded places by making these places more resilient to terrorism'⁷ as well as specific hostile vehicle guidance that argues that 'no longer must we equate effective physical protective security with cold, sterile measures of austerity. Creative innovation [should pave] the way for seamlessly integrated protection measures that complement and enhance current needs and desires within public and private spaces'⁸.

How: Implementation and design process

Security interventions to protect Federation Square have evolved in two main phases and have attracted global media attention. Initially in June 2017, as a result of a heightened threat profile given recent vehicle-as-weapon attacks in London, Berlin and Stockholm, over 150 temporary concrete anti-terror barriers were placed in and around key public places in Melbourne, including Fed Square. This also followed the allocation of \$10 million in the Victoria State budget to increase security measures across its jurisdiction. Additional CCTV cameras and loud-speakers were also installed. These actions followed a deadly siege in central Melbourne in early June 2017 that left two people dead. As the State of Victoria premier noted at that time, speed of response was of the essence, despite the ugly appearance of the concrete blockers: "We weren't going to wait around for six months or twelve months while planter boxes are built so they look better". He continued: "The threat of terror — the threat of hostile vehicle attacks, the threats to public safety — are all too real" and there is "no time to be wasted."⁹

7 See *Australia's Strategy for Protecting Crowded Places from Terrorism* 2017 <https://www.nationalsecurity.gov.au/Media-and-publications/Publications/Documents/Australias-Strategy-Protecting-Crowded-Places-Terrorism.pdf>

8 See *Safe Places — A Comprehensive Guide for Owners, Operators and Designer*, 2012 <https://www.emergency.nsw.gov.au/Documents/publications/guidelines/Guidelines-Safe-Places-Vehicle-Management.pdf>

9 See *The Age*, June 10, 2017: <http://www.theage.com.au/victoria/premier-announces-counterterror-security-measures-for-melbournes-cbd-20170609-gwokeu.html>

In Melbourne, a counter-protest to the installation of such security measures was organized and went viral on social media — #bollart — where the concrete blockers placed around pedestrian hotspots were artistically decorated as a reaction against what many saw as an unnecessary eyesore that risked turning the city center into a fortress rather than the world's premier livable city.



Image from the Creative Commons

In late 2017, Melbourne City Council, working closely with the Victorian Government and Victoria Police, unveiled the second phase of a comprehensive security plan to deter high speed vehicle attacks by terrorists. The plan — likely to take a year to enact in full — will eventually see the CBD fitted with more bollards of varying designs, 'planters', and special road treatments, such as chicanes, to stop cars mounting curbs. As Melbourne Lord Mayor noted "We are about to spend money in the city on bollards, and different sorts of obstructions that will change the face of the city, probably forever."¹⁰



Above: An artist's impression of the permanent metal bollard and planter boxes. (Image supplied by the Victoria Government)

Right: An artist's impression shows the permanent bollards, in red, and the planter boxes, in yellow. (Image supplied by the Victoria Government)



10 See *The Herald Sun*, October 27, 2017: <http://www.heraldsun.com.au/news/victoria/bollard-bid-to-protect-melbournes-cbd-from-terrorist-attacks/news-story/3481de5986df7fe027ad2e417fee1d9e>

In November 2017, the installation of new permanent metal bollards, heritage-style green posts and planter boxes was rolled out in Federation Square, replacing the concrete blocks and guarding the mall against another vehicular attack. These new devices are crash-rated and tested to withstand “significant” vehicle force. The bases of the bollards are connected together undergrounds in order to enhance their robustness. Some of the bollards have also been designed to be retractable (so-called silver-bullet bollards) to maintain emergency vehicle access.

Outcome: Usage and evaluation

The rolling out of a comprehensive security solution in and around Federation Square, and Melbourne’s CBD in general, has occurred swiftly given the heightened threat levels and as part of a \$10 million security upgrade. The essence of the designed scheme is to create a solution whereby unauthorized vehicular access is restricted thus creating a comprehensive safe zone that better protects the public from a hostile vehicle attack. This was equated to the City of London’s ‘ring of steel’ configuration by Melbourne Lord Mayor: a solution that was put in place in the mid-1990s and that effectively encircles and secures a key location through the use of physical interventions and surveillance measures.

The scheme currently being put in place meets the expected standards of security in terms of crash ratings whilst, where possible, ensuring the best visual outcome. In this case, the speed of installation has been understandably prioritized over aesthetic and design appearance.

	Low	Medium	High
Security effectiveness			✓
Design integration	✓		
Cost		✓	

Case Study 4

Europe: Milan and other Italian cities — Counter-Terror Flower Pots Take Root

Why: Context and requirement

Throughout 2017, concrete barriers have been installed at famous landmarks across Italy. Although Italy has not suffered any major attacks on its territory, there have been repeated warnings by ISIS that the country is on its hit list. Therefore, major tourist sites have stepped up security in crowded areas.

This proactive security activity was further enhanced following the vehicle and weapon attack in Barcelona in August 2017. In Rome, concrete blocks were put in place around its main shopping streets and tourist areas including the Colosseum. In Milan, more concrete barriers appeared in the wake of the La Rambla attack, in the streets leading up to the city's main piazza which houses its famous cathedral — the *Duomo di Milano* — and adjacent streets containing the Galleria Vittorio Emanuele. Genoa, Naples, Palermo, Pisa and Turin all put protective barriers in place to separate vehicles and pedestrians. In Bologna, security was tightened around the Basilica of San Petronio. The church has been the target of several jihadi plots because it houses a 15th-century fresco which depicts the prophet Mohammed being tortured by devils.



Image source: <http://www.manuinvisible.com/en/news/manu-invisible-paints-the-anti-terrorism-barriers-new-jersey-for-christmas/>

How: Implementation and design process

The public reaction to the imposition of concrete blockers has, however, stimulated a national conversation about the balancing of security and accessibility in public places and the importance of the aesthetical quality of the public realm. In Milan, protective security was initially stepped up in late 2016 following the shooting in the city of the chief suspect in the Berlin market vehicle attack. Immediately following this incident, the municipality and local artists sought to ensure that the overt military look of the installed concrete barriers were softened through artistic intervention.

A street art initiative which, starting from the Duomo, spread throughout the city aimed at transforming anti-terrorism barriers into open-air works of art. The first intervention was made by Manu Invisible. The work is called "Navidad" and symbolizes the family with two reindeer, mother and child, represented with various shades of color.

Similarly, in Palermo, Sicily, in the wake of the protective security interventions put in place following the Barcelona attack, the city authorities called on painters, sculptors, and designers to produce artworks on the concrete blocks. The mayor of the Sicilian capital has also pledged to unite an alliance of creatives to design pots for his city 'so that anti-terrorism barriers will lose all or at least some of their distressing appearance.'¹¹ Likewise, the Bari mayor also stated he wanted to involve students from Bari's Fine Arts Academy, who could decorate the large pots in order to create "the best response to extremism."¹²

Across Italy, a non-bollard approach has taken root following world-renowned architect Stefano Boeri's call for a different approach to concrete barriers: trees with bulky planters to prevent vehicles targeting pedestrians. Whilst such an approach has been considered by counter-terrorism experts for over 20 years, in most cases they are dismissed as too costly and not robust enough.

438f7cdf37274d7f9c6b4d0136b88b75

Image source: <http://www.cuadra.it/en/anti-terror-barriers-cuadras-solutions/>

Boeri, best known for his vertical forest buildings, argued that in light of the recent rise of vehicle-led terror attacks in Barcelona, Nice, Berlin, London and other locations, it was crucial to rethink the traditional approaches to protective security:

"We cannot afford to see the thousands of squares and public spaces present in the hundreds of European cities transformed into war check-points...A big pot full of soil has the same resistance to a Jersey [modular concrete barrier], but it can host a tree – a living being that offers shadow; absorbs the dust, subtle pollutants and the CO2; produces oxygen; homes birds."¹³

He argued that such planters would integrate better with picturesque plazas, monuments and architecture, complimenting instead of "ruining our extraordinary historic and cultural heritage of urban collective places." He further highlighted that bespoke 'hardened' street furniture could also be utilized – from benches to bicycle racks – which would not only provide barriers to vehicle-led attacks, but also improve the functionality of public spaces in the city.

This new and integrated design approach is slowly being adopted across a range of Italian cities. In Rome, forty large pots containing oleander flowers have been placed around the perimeter of Piazza del Quirinale in Rome, an official residence of the Italian president. The city of Florence has also been a key advocate of Boeri's proposals, where its mayor has stated that they should use trees and planters to protect against terrorist attack instead of 'ugly' military-style barriers, and hoped that cities across Italy and Europe will follow Florence's lead:

11 See Geller Report, August 29, 2017: <https://pamelageller.com/2017/08/anti-terror-flower-pots-take-root-italian-cities.html/>

12 Ibid

13 See Dezeen, August 24, 2017: <https://www.dezeen.com/2017/08/24/stefano-boeri-tree-barriers-prevent-vehicle-terror-attacks-news/>

Outcome: Usage and evaluation

*"I think Florence has a responsibility to embody the role of a symbolic city, where we must combine the security of our citizens with the beauty of the city...We must not give in to the blackmail of terrorists and let our city be turned into military bunkers."*¹⁴

For security reasons, major cities throughout Italy have been given an anti-terrorist makeover, mostly using grey blocks of concrete that restrict vehicular access. The reaction to the imposition of such 'ugly' and temporary security measures has stimulated a lively debate amongst local municipal authorities and the cultural community about less obtrusive, but equally effective, alternatives. As the mayor of Bari and President of the National Association of Italian Municipalities noted, such an integrated approach is "a way not to militarize our urban centers while making them greener," and enhancing rather than detracting from the quality of the public realm:

"It would be a good idea to imagine blocks that are colorful or decorated with some green plants, which is always good for cities, obviously guaranteeing their deterrent functionality. I just want the beauty of our cities not to be attacked by concrete blocks."¹⁵

	Low	Medium	High
Security effectiveness		✓	
Design integration			✓
Cost		✓	

¹⁴ Ibid

¹⁵ See *Italian Insider*, August 23, 2017 : <http://www.italianinsider.it/?q=node/5797>

Case Study 5

Middle East: Saadiyat Island Cultural District, Abu Dhabi – Fit-for-purpose security design

Why: Context and requirement



Image source: By Wikiemirati
(Own work) [CC BY-SA 4.0
(<https://creativecommons.org/licenses/by-sa/4.0/>)], via Wikimedia Commons

As part of their 2030 vision, in 2013 the Abu Dhabi Urban Planning Council produced the Abu Dhabi Safety and Security Planning Manual (SSPM) to 'ensure the creation of safe and secure communities that enhance the quality of life and reflect the Emirate's unique identity' and to ensure that 'planning and design guidance will embed counterterrorism protective security in the built environment, reducing vulnerabilities and increasing the resilience of our communities.'¹⁶

The manual represents a proactive attempt to change planning culture and to make safety and security a core consideration alongside other planning stipulations, to schedule safety and security early in the development process, and to introduce best practice principles for both new and existing development. This involves, in particular, engagement in a process of risk assessment to judge the likelihood and impact of terrorist risk, and to ensure that community safety and protective security arrangements in new and existing developments are fit-for-purpose and proportionate to the risks faced. Additionally, the Abu Dhabi model of security design, unlike those operating in other parts of the world, has an owner-pays stipulation and is strongly enforced through planning and design regulations.

How: Implementation and design process

As part of their 2030 Vision, a wide-ranging government funded implementation program is being rolled out through the SSPM and seeks to identify any safety and

16 See *Abu Dhabi Safety and Security Planning Manual* (SSPM) : <https://www.upc.gov.ae/en/publications/manuals-and-guidelines/abu-dhabi-safety-and-security-planning-manual>

security improvements needed to existing buildings or new developments. Such appropriate securitization of the built environment is seen as essential in sustaining and promoting future economic growth and ensuring that Abu Dhabi 'remains safe, secure and welcoming as it continues to grow and attract a range of diverse activities, people and opportunities.'

One key area for development has been the Saadiyat Island Cultural District Master Plan that includes a series of high profile and iconic cultural buildings that require protective security. The overall development, although mixed-use, is focused on accommodating a cluster of cultural developments with a similar risk profile such as the Zayed National Museum, the Louvre Abu Dhabi, the Guggenheim Abu Dhabi, all of which are considered potentially vulnerable crowded places that will require protection against terrorism and specific types of crime, particularly art theft.

Whilst the implementation of the overall masterplan on Saadiyat Island has been slower than expected, the Louvre Abu Dhabi was opened at the end of 2017, providing an example of integrated and designed-in security that will benefit both this development and the Cultural District as a whole.

An integrated development process of the cultural district was adopted by the Tourist Development Investment Company (TDIC) with security being identified as a key requirement at the earliest possible stage. The early involvement of security specialists meant security objectives could be achieved without a negative impact on aesthetics or function. For the development of the masterplan, this process resulted in a range of security solutions concerned with securing the perimeter of the site and associated underground tunnels, and the screening of vehicles and pedestrians (including security to restrict boat-borne terrorist attack). For example, in the newly opened Louvre Abu Dhabi, the screening points were relocated to the edges of the development so as to be situated a considerable distance from public spaces and the main structures of the museum buildings.

Complementing the designed in security features, a security system comprising over 400 state-of-the-art surveillance cameras and alarms has also been embedded into the fabric of the building.

Outcome: Usage and evaluation

Underpinned by the *Abu Dhabi Safety and Security Planning Manual* (SSPM), security has been an integral element in advancing the Saadiyat Island Cultural District masterplan and the construction of the Louvre Abu Dhabi. Unlike in other parts of the world, where security is often seen as an add-on to major development and with security consultants being called in late in the day, or security downgraded in importance when costs rise, in Abu Dhabi, and exemplified by the Louvre development, security is seen as a key design driver of development and is strongly supported and regulated by the Emirate's Urban Planning Council (UPC).

As a result, in Abu Dhabi, it has been possible to embed protective security measures into the fabric of new developments and to shape masterplans so as to create better and less obtrusively security than is the case elsewhere. Key to this has been the consideration of security elements early enough in the project life-cycle. This has, for example, allowed vehicle access restrictions to be put in place where appropriate, amending road layouts to be designed, subtle changes to plot layouts to be made, and in one case changing the path of a canal on Saadiyat Island to afford better protection to iconic new museum buildings. Such physical and design intervention work hand-in-hand with security technologies to provide a well-rounded security plan for an area or site.

	Low	Medium	High
Security effectiveness			✓
Design integration			✓
Cost			✓

Technical Specifications

Introduction

This section of the report takes a closer look at technical specifications of urban furniture used for security in public space. The research team attempted to capture examples of creative projects that are both more aesthetically pleasing and less intrusive than concrete barriers, and also effective from a security standpoint. The following pages include an analysis of the technical attributes of each piece or project, which were compared against specific criteria developed through this research to help gauge the effectiveness of each project. The products included in this section were drawn from a review of existing and developing projects around the world and were selected based on the criteria described in the following pages.

Urban furniture alone does not represent a safety model. It must necessarily be placed in the context of an intervention plan adapted to the situations in which it will be used¹⁷. As specialists in temporary space design and user experience, the research team's contribution to this research acknowledges the importance of design as part of a whole master plan for urban interventions.¹⁸

The choice of 20 'exemplary' projects is based on the criteria presented in the Effectiveness Assessment Guide (E.A.G) [see below]. This provides a methodology that is meant to help to compare the different projects. Its value comes from the fact that the 20 products bring together a range of examples of interventions in the field of safety and security, from manufactured and tested products (e.g. hydraulic bollards), to customized solutions at given locations (e.g. public squares). With the E.A.G., each project can be compared on a common scale, when applicable, to identify strengths and weaknesses. The Effectiveness Assessment Guide outlines seven descriptive criteria that cover the main aspects buyers should take into consideration when acquiring safety devices for their public spaces.

The inventory of furniture selected for this research is described in the corresponding Technical Specifications Sheet. This inventory provides a simple way of gathering factual and technical information such as dimensions, materials, special characteristics, prices, and more. This data serves as the raw material to compare the projects and initiate a global reflection on the best ways to implement safety measures in places prone to large-scale gatherings.

Effectiveness Assessment Guide

Definition of evaluation criteria for determining the extent to which the furniture is effective in countering terrorist acts (for this specific research report, this is focusing on vehicular attacks).

Evaluation of certain aspects (yes-or-no questions) to help GCDN members (buyers) gauge effectiveness.

1. Safety and Security
2. Aesthetics
3. Durability
4. Mobility
5. Production
6. Maintenance
7. Other

¹⁷ Based on discussions with Alain Hudon, Sergeant, Antiterrorism and Emergency Services, Police Services of Montreal. September 8, 2017.

¹⁸ Judith Portier, project leader, Myriam Peixeiro, researcher and principal writer, and Émilie Cormier, assistant researcher, have put together a series of analysis tools and studied more than 50 projects in order to find innovative responses to the safety and security concerns in public places.

1. Safety and Security

Definition: This determines whether the furniture's form effectively contributes to public **safety and security**. It must be visible **day and night** (using reflective strips, for example) and its **proportions** must be ergonomically appropriate for use in public places. Its finish must also help prevent physical injury. Modularity for multi-unit assemblies is also considered. For the purposes of this specific research, it must also contribute to the public and the space's security through its ability to counter a vehicular attack, either by deterring or completely blocking an unwanted vehicle's passage.

Evaluation:

- Is it highly visible (so that its presence will not lead to injury)?
- Is its form safe (no hazards such as sharp edges)?
- In case of a terrorist act, will it be possible to direct the public to the right place?
- Can the material withstand a vehicular attack?

2. Aesthetics

Definition: This criterion covers everything related to the research team's perception of the furniture. It demonstrates **originality**. It is **invisible** in context. It can have a **secondary use** (e.g. play). It can evoke art such as sculptures or installations, to help better integrate into its context.

Evaluation:

- Does the furniture blend in with its environment?
- Does it show originality or have a unique design?
- Does it use high quality materials?

3. Durability

Definition: Anti-terrorism street furniture should be **shock-resistant**. Since the goal is to re-use these items multiple times, the materials must be **durable** and resistant to harsh weather, temperature changes, and extremes. Materials must also be **robust** enough to withstand frequent moving or rearranging.

Evaluation:

- Is the furniture able to **withstand** frequent moving and rearranging?
- Is it made of **durable** materials?
- Can it be used in all **seasons**?

4. Mobility

Definition: **Mobility** is a very important consideration. If an item is too heavy or requires special **machinery** to move, it will be a distinctly less appealing option. **Storage** is an equally important consideration.

Evaluation:

- Is it **easy** to move?
- Is it easily **stackable and storable**?
- Can units be **grouped**?

5. Production

Definition: A piece of furniture is a much more attractive option if it can be **produced** in quantity, particularly if the **production time and cost** are reasonable.

Evaluation:

- Can the furniture be manufactured on an assembly line?
- Is the production time shorter than the average for products researched?
- Is the purchase price below average?

6. Maintenance

Definition: Pollution, crowds, dirt in the street and the changing seasons may affect the furniture, which must be well-maintained at all times. Like most items placed in public, furniture is a target for **vandalism** such as graffiti. It is therefore necessary to consider the impact of wear and tear.

Evaluation:

- Is the material stain-resistant?

- Is it graffiti-resistant?
- Is it easy to clean?

7. Other:

Definition: Any other relevant feature that distinguishes this furniture in terms of effectiveness in the public realm, and which is not included in any of the criteria above.

Evaluation:

- Does the furniture have another relevant function?
- Is it suitable for mounting signage?
- Can it be customized (e.g. with planters)?

Furniture/ Devices

Furniture /device

Bollard Pillar B 275/600.6C LI SD

Dissuasive hydraulic bollard.



Images courtesy of
BFT

Manufacturer: BFT Americas, Inc.
6100 Broken Sound Pkwy., N.W., Suite 14, Boca Raton, FL 33487

Production process: factory

Dimensions (1 unit): 0,275 m diameter X 0,6 m height (off ground)

Weight: 136kg

Frontal resistance: 20 000 J

Volume: 0,14 m³

Installation kit content: The product is always installed by the producing company.

- Independent hydraulic pump for each bollard, access for simplified servicing, protection anti-tampering switch sensor (option)
- Break-in resistance
- Sensors for bollard positions
- Bollard top cover with LED lights and buzzer
- Interfaces for remote control

Principal materials: Stainless steel

Special characteristics: N/A

Production (1 unit): 6 US\$320,00 (8-12 weeks delay)

Cost/shipping time USA/NY — US\$400,00

Cost/shipping time QC / Canada — US\$500,00

Operation:

Machinery required: N/A

Activity type (permanent/temporary): permanent

Operating temperature: -40°C to 60°C

Cleaning method:

- Maintenance must be carried out by qualified personnel only.
- Visually check the overall state of wear and tear of the external parts of the deterrant bollard.
- Make sure the rear-reflecting film is not worn.
- Make sure the lights work.
- Make sure the emergency manoeuvre is working properly.
- Make sure the control unit and safety devices are in proper working order.

Certified anti-terrorism: Yes

Performance details / test: N/D

Rating:

Security	●	●	●	●
Aesthetics	●	●	●	●
Durability	●	●	●	●
Mobility	●	●	●	●
Production	●	●	●	●
Maintenance	●	●	●	●
Other	●	●	●	●
Effectiveness	●	●	●	●

Notes:

- LED lighted top

Links:

Technical information:

https://www.bft-automation.com/fr_FR/pdf-download/?tx_productmanager_productviewer%5Bfamily%5D=43

Furniture /device

Automatic Hydraulic Retractable Bollard R250HY05/500

Advised for sensitive areas such as airports, embassies, banks, tourist ports, government buildings, etc.



Image courtesy of
GS Ingénierie

Manufacturer: GS Ingénierie
Allée des Bourguignons — ZI — 84400 APT

Designer: N/A
Production process: factory

Dimensions (1 unit): 0,254 m diameter X 0,5 m height

Weight: 115 kg

Frontal resistance: 15 tons

Crush resistance: 6 tons

Extraction resistance: 3 tons

Volume: 0,39m³

Installation kit content:

- 1 round body bollard 27,3 cm diameter (outbound part 25,4 cm diameter) stainless steel. Full size 50 cm height with protected reflective band and a standard 20-meter-long electric cable.
- 1 electronic control unit
- 2 transmitters (remote controls)
- 1 receptor
- 1 antenna
- 1 magnetic loop, 9 meters of perimeter
- 1 revealer (magnetic loop sensor)
- 1 flasher
- A second magnetic loop and its revealer (in option)
- 1 intervection key, lid specific
- 1 specific bottom key

- 1 technical sheet
- 1 service implementation document

Principal materials: Standard hot galvanized steel
Special characteristics: Protection against corrosion

Production (1 unit): 4306,00 EUR
Cost/shipping time USA/NY: N/D
Cost/shipping time QC / Canada: N/D

Operation:

Machinery required: N/D

Activity type (permanent/temporary): permanent

Operating temperature: N/D

Cleaning method: The maintenance of the terminal is almost non-existent. It is recommended to change the cylinder seals every 1 million cycles.

Certified anti-terrorism: Yes

Performance details / test:

Frontal resistance: 15 tons

Crush resistance: 6 tons

Extraction resistance: 3 tons

Rating:

Security	●	●	●	●
Aesthetics	●	●	●	●
Durability	●	●	●	●
Mobility	●	●	●	●
Production	●	●	●	●
Maintenance	●	●	●	●
Other	●	●	●	●
Effectiveness	●	●	●	●

Notes:

- Requires 220V single-phase for operation
- Positive lock
- 2-year warranty
- Class II protected reflective band
- 2000 cycles per day max (1 cycle = in + out)
- Choice of RAL chart painting
- Other section shapes available (i.e. square)
- Other materials available
- Retraction time: 5 seconds
- 30 years shelf life

Links:

Technical information:

<http://www.gsingenierie.com/wp-content/uploads/2017/09/R250HY-06-1.pdf>

Furniture /device

Bollard BSNEONE80

These bollards use LED technology to add light and color in urban spaces, demarcate pedestrian zones, and highlight the architecture of monuments and buildings. They are also robust enough for security purposes, protecting pedestrians or buildings from vehicular intrusions. They can be fixed, semi-automatic, and automatic.



Image source: <http://www.archiexpo.com/prod/came-urbaco/product-50081-1271657.html>

Manufacturer: Urbaco S.A.
457 avenue du Clavier — Z.A. du Couquiou — 84320 Entraigues — France

Distributor: Les entreprises J.C. Roy
Designer: N/A
Production process: factory

Dimensions (1 unit):
0,2 m diameter x 0,8 m height
Weight: 17 kg
Impact resistance: standard ISO 179/1eA=70 KJ/m²
Volume: 0,5m³
Installation kit content: N/D

Principal materials: Painted steel (against corrosion) and galvanized steel
Special characteristics: LED band, light-diffusing polycarbonate tube, high impact resistant and protected against UVs, top and base in RAL painted stainless steel. 100% recyclable.

Production (1 unit): N/D
Cost/shipping time USA/NY: N/D
Cost/shipping time QC / Canada: N/D

Operation:
Machinery required: N/D
Activity type (permanent/temporary): permanent
Operating temperature: -20 °C to 70°C
Cleaning method: N/D

Certified anti-terrorism: Yes

Performance details / test: Impact resistance: standard ISO 179/1eA=70 KJ/m²

Rating:

Security	●	●	●	●
Aesthetics	●	●	●	●
Durability	●	●	●	●
Mobility	●	●	●	●
Production	●	●	●	●
Maintenance	●	●	●	●
Other	●	●	●	●
Effectiveness	●	●	●	●

Notes:

- Multicolored version available
- Still light/flash light
- Customizable program

Links:

Video:

http://www.jcroyinc.com/neon_fr.php

Technical information:

<http://www.urbaco.com/FR-FR/emotion-neon/FTC-BSNEONE80-V2.5-FR.pdf>

http://laudprodukter.no/wp-content/uploads/pdf_files/ftc_-_bsneone80-v2.5-en.pdf

Furniture /device

Estrell Bollard

The Estrell bollard is a removable device. It is inserted in its base, which is anchored to the ground. It can ensure the protection of urban areas, pedestrians, schools, etc.



Image source: <http://www.design-espaces.fr/produit-1-11-14-borne-estrell.html#formulaire>

Producer: Design Espaces
ZA Coulmet, 8 Impasse Alexandre Yersin
10450 Bréviandes, France

Designer: N/D

Production process: factory

Dimensions (1 unit): 0,204 m diameter x 0,8 m height

These dimensions correspond to the PMR standards according to the Certu chart of June 2009

Weight: N/D

Frontal resistance: N/D

Volume: 0,5m³

Installation kit content: N/D

Principal materials: Stainless steel

Special characteristics: brushed finish/microbeaded/electropolish, LED lighted (6W), 220V alimentation.

Production (1 unit): N/D

Cost/shipping time USA/NY: N/D

Cost/shipping time QC / Canada: N/D

Operation:

Machinery required: N/D

Activity type (permanent/temporary): both

Operating temperature: N/D

Cleaning method: N/D

Notes:

- Customization available (laser cutting)
- All RAL tints available

Certified anti-terrorism: N/D

Performance details / test: N/D

Rating:

Security	●	●	●	●
Aesthetics	●	●	●	●
Durability	●	●	●	●
Mobility	●	●	●	●
Production	●	●	●	●
Maintenance	●	●	●	●
Other	●	●	●	●
Effectiveness	●	●	●	●

Links:

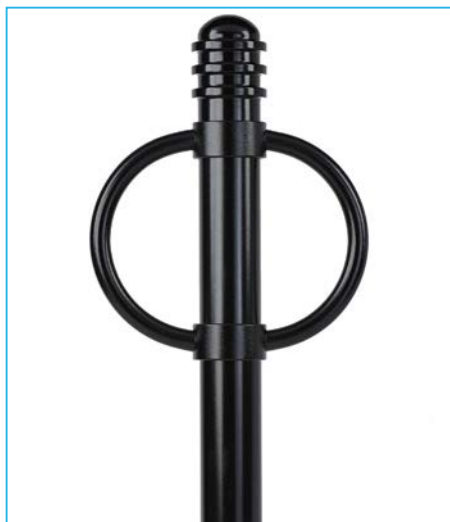
Technical information:

http://www.design-espaces.fr/produit-1-11-14-borne_estrell.html

Furniture /device

Bike Bollard R-7905

These bike bollards combine traffic management with secure bicycle storage. These bollards can guide vehicular traffic and increase accessibility by providing bicycle parking. They are easy to install and are composed of top-grade material that is fully recyclable.



Images courtesy of
Reliance Foundry Co. Ltd.



Manufacturer: Reliance Foundry Co. Ltd.
Unit 207, 6450-148th street
Surrey, British Columbia, Canada V3S 7G7

Designer: N/A

Production process: Factory

Dimensions (1 unit): 0,1 m diameter (body and base) x 0,91 m height

Weight: 23,1kg

Frontal resistance: N/D

Volume: 0,28m³

Installation kit content:

For collapsible mounting bollard:

- 1 Bollard
- 1 Fold Down Base
- 2 Button Head Bolt 3/8»
- 2 O-Ring 3/8»
- 2 Hex Nut Nylon Lock 3/8»
- 4 Button Head Bolt 1/2» x 1-1/4»
- 4 Washer 1/2»
- 4 Drop-in Concrete Insert 1/2»
- 1 Padlock (optional)

Principal materials: Steel (ASTM A36; 25 percent recycled-material content)

Production (1 unit): \$391,00 (US) + \$265,00 (removable mounting system)
\$418,00 (CAD) + \$218,00 (removable mounting system)

Cost/shipping time USA/NY: \$314,00 (US)

Cost/shipping time QC / Canada: \$139,00 (CAD)

Operation:

Machinery required: none

Activity type (permanent/temporary): permanent

Operating temperature: N/D

Cleaning method: Routine (at least every 6 months) cleaning with soap and water is usually sufficient to maintain Reliance Foundry products. Use a soft nylon brush to remove any accumulated dirt. Wash with mild soap or detergent, then rinse in clean water and wipe dry with a soft cloth. Neglected or damaged products may require additional care.

Certified anti-terrorism: Yes

Performance details / test: N/D

Rating:

Security	●	●	●	●
Aesthetics	●	●	●	●
Durability	●	●	●	●
Mobility	●	●	●	●
Production	●	●	●	●
Maintenance	●	●	●	●
Other	●	●	●	●
Effectiveness	●	●	●	●

Notes:

- Arms match body
- Color coating (6 custom colors) polyester powder coat over epoxy primer
- 3 mounting types (removable, fold-down, embedded)
- Optional accessories available
- Removable mountings sold separately
- Some environments — including high-saline locations subject to saltwater spray or de-icing salts, or high-traffic areas with abundant particulates or other pollutants — will require more frequent attention.

Links:

Technical information:

<http://www.reliance-foundry.com/bollard/all-bollards/r-7905-bollard>

<http://www.reliance-foundry.com/bollard/fold-down-bollards-installation>

Furniture /device

Giove — Protective Planter

The Bellitalia PAS rated Large Giove Protective Planter provides an elegant solution for security in the public realm with the additional benefit of adding greenery to the space.



Image courtesy of
Marshall's

Product or distributor: Marshall's

Production process: factory

Dimensions (1 unit): 0,9m height (above ground) x 2m width

Excavation depth: 0,95m

Weight: N/D

Volume: 3,6m³

Installation kit content: N/D

Principal materials: Cast from a mix of concrete and fine Italian marble aggregates sourced from specific regions of Italy.

Special characteristics: Polished during manufacture to leave a smooth surface, then treated with a protective varnish and polished further to provide a sleek, glossy finish.

Production (1 unit): N/D

Cost/shipping time USA/NY: N/D

Cost/shipping time QC / Canada: N/D

Operation:

Machinery required: semi-trailer, van, forklift

Activity type (permanent/temporary): Permanent

Operating temperature: N/D

Cleaning method: N/D

Notes: The use of high quality natural marble ensures long term color consistency, meaning that the color of the planter will not fade over time. The design of the RhinoGuard™ frame allows for the root ball of a medium sized tree to be contained inside the planter, providing landscape architects with the freedom they require to introduce creative planting solutions into the built environment. The high strength frame is designed to fit seamlessly inside a range of cosmetic planter styles in various materials, providing a design-led, high performance security solution that can both aesthetically enhance and protect any scheme.

Certified anti-terrorism: Yes

Performance details / test:

PAS 68 standard

Vehicle: Un-laden 7.5 ton two axle rigid N3 lorry

Vehicle Speed: 50mph (80km/h)

PAS68 Classification Code: V/7500(N3)/80/90:3.5/35.5

Test Results: The vehicle was completely immobilized, eliminating the chance of a second attack.

Rating:

Security	●	●	●	●
Aesthetics	●	●	●	●
Durability	●	●	●	●
Mobility	●	●	●	●
Production	●	●	●	●
Maintenance	●	●	●	●
Other	●	●	●	●
Effectiveness	●	●	●	●

Links

Articles:

<http://www.ledauphine.com/france-monde/2017/05/22/le-festival-et-la-croisette-a-cran>

Furniture /device

Planter 'Anti-Intrusion' (JA108 Vigipirate)

This planter has been designed to meet the protection needs of municipalities, businesses, associations, tourist sites, etc. It is capable of stopping a truck.



Images courtesy of Buton Design
Creative Expression

Producer: Buton Design
Rue des Chaumes — BP19
85170 Le poire-sur-vie, France

Designer: N/D

Production process: factory

Dimensions (1 unit): 1,2 m length x 1,2 m width x 1,19 m height

Weight: 2,5 tons

Frontal resistance: N/D

Volume: 1,71m³

Installation kit content: N/D

Principal materials: Cast-in-place concrete block, bund made of hot galvanized steel

Special characteristics: Finish of solid compact 12 mm HPL

Production (1 unit): N/D

Cost/shipping time USA/NY: N/D

Cost/shipping time QC / Canada: N/D

Operation:

Machinery required: truck crane or Fenwick type forklift

Activity type (permanent/temporary): temporary

Operating temperature: N/D

Cleaning method: N/D

Certified anti-terrorism: Yes

Performance details / test: N/D

Rating:

Security	●	●	●	●
Aesthetics	●	●	●	●
Durability	●	●	●	●
Mobility	●	●	●	●
Production	●	●	●	●
Maintenance	●	●	●	●
Other	●	●	●	●
Effectiveness	●	●	●	●

Links:

Technical information:

<https://www.buton-design.com/actualites/316-nouveau-produit-jardiniere-anti-intrusion.html>

<https://www.buton-design.com/produits/jardiniere-anti-intrusion-vigipirate/>

Contact:

franck.giffard@buton-industries.com

Furniture /device

Modular Vehicle Barrier (MVB)

This lightweight, moveable, and modular vehicle barrier is designed to help prevent vehicular intrusions– for deployment in combat zones, camps, and installations, as well as for civilian uses. Its special design (L shaped) acts to block stop a vehicle by transferring the vehicle's horizontal momentum to vertical momentum. The barrier directs the momentum downwards into the ground in order to drastically reduce or terminate its forward momentum. The stopping distance and number of barriers needed for any weight and vehicle speed are provided by Mifram as part of its service.



Image courtesy of Mifram Security

Producer: Mifram Ltd.
6 Josef Levi st, Zur Shalom industrial area
P.O.Box 1165, K. Bialik. Zip Code 2711101 Israel.

Distributor: Securityplus
Designer: N/A
Production process: factory

Dimensions (1 unit): 1 m length x 0,6 m width x 0,7 m height
Weight: 22 kg
Frontal resistance: 11 tons
Volume: 0,42 m³
Installation kit content: N/D

Principal materials: Steel ST52

Production (1 unit): 1000\$ US
Cost/shipping time USA/NY: N/D
Cost/shipping time QC / Canada: N/D

Operation:
Machinery required: None

Activity type (permanent/temporary): Temporary

Operating temperature: Any climatic conditions

Cleaning method: No need of special care within the first 15 years except for mild cleaning.

Notes

- Can be used in any type of terrain
- Compact storage (folding barrier)
- Assembly time: 10 minutes
- Can be rented
- No need of specific maintenance during at least the first 15 years

Certified anti-terrorism: Yes

Performance details / test: PATENT PENDING

Tested by The Technion Institute

Cat. No. BMFR-020

Rating:

Security	●	●	●	●
Aesthetics	●	●	●	●
Durability	●	●	●	●
Mobility	●	●	●	●
Production	●	●	●	●
Maintenance	●	●	●	●
Other	●	●	●	●
Effectiveness	●	●	●	●

Links:

Videos:

Video of the impact of the vehicle on the device (reaction):

<https://www.youtube.com/watch?v=44p21X-iwKY>

Video of the assembly:

https://www.youtube.com/watch?v=6oBOcPhxf_s&feature=youtu.be

Technical information:

<http://fr.miframsecurity.com/solutions/products/mvb/>

Articles:

<http://www.ledauphine.com/vaucluse/2017/07/12/la-ville-se-dote-du-top-de-la-protection-antiterroriste>

<https://www.i24news.tv/fr/actu/israel/diplomatie-defense/133449-161224-l-allemande-commande-des-barrieres-modulaires-israeliennes-pour-vehicules>

<https://www.i24news.tv/fr/actu/israel/diplomatie-defense/133449-161224-l-allemande-commande-des-barrieres-modulaires-israeliennes-pour-vehicules>

<http://tempsreel.nouvelobs.com/societe/terrorisme/20170818.OBS3536/attentats-a-avignon-des-barrieres-de-pointe-anti-voitures-beliers.html>

Furniture /device

Talon — Steel-Spiked Dragnets

A spiked net designed to stop a terrorist lorry attack in its tracks has been unveiled by Scotland Yard to protect large public gatherings in the capital. The heavy net bristling with tungsten steel spikes can stop and trap a vehicle weighing up to 17-tons and was used for the first time to protect the Naval Associations Parade in Central London.



Image source:
<https://www.thesun.co.uk/news/4435433/cops-reveal-steel-spiked-super-stinger-road-mats-to-stop-terrorists-using-vehicles-in-attacks/>

Producer:

Production process: factory

Dimensions (1 unit): Approx. 3m width x 6m length x 0,07m height

Weight: N/D

Frontal resistance: N/A (Stops a 17-ton vehicle)

Volume: N/D

Installation kit content: N/D

Principal materials: Tungsten steel spikes

Netting

Production (1 unit): N/D

Cost/shipping time USA/NY: N/D

Cost/shipping time QC / Canada: N/D

Operation: The net can be deployed quickly by just two officers in less than one minute

Machinery required: none

Activity type (permanent/temporary): Temporary

Operating temperature: N/D

Cleaning method: N/D
































Notes: The nets are designed as an improvement on traditional spike strips — known as “stingers” — that have been deployed by the military and police for years to end car chases and protect checkpoints by blowing out tires. With the Talon nets, a police statement said, “the vehicle skids in a straight line significantly reducing risk to crowds and producing a well-controlled stop after which officers can engage with the driver.”

When the equipment is deployed, signs are placed in front and behind the net site advising both road users and pedestrians that there are spikes on the road and to follow instructions provided by officers.

Certified anti-terrorism: N/D

Performance details / test: Chief Inspector Nick Staley said: "This equipment undoubtedly has the potential to save lives."
Source: <https://www.thesun.co.uk/news/4435433/cops-reveal-steel-spiked-super-stinger-road-mats-to-stop-terrorists-using-vehicles-in-attacks/>

Rating:

Security				
Aesthetics				
Durability				
Mobility				
Production				
Maintenance				
Other				
Effectiveness				

Links:

Articles: <https://www.thesun.co.uk/news/4435433/cops-reveal-steel-spiked-super-stinger-road-mats-to-stop-terrorists-using-vehicles-in-attacks/>

Furniture /device

CT Sentry Block

This new VAW (Vehicle as a Weapon) range is the first purpose built perimeter security system on the market. The products have been created to act as a visible deterrent that stops would-be terror attacks from happening with temporary, deployable concrete blocks and barriers that fortify the perimeter of the event space.



Image source:
<http://www.townscapeproducts.co.uk/event-perimeter-security>

The system has been designed to be quickly deployable for semi-permanent counter terror security or temporary public events held in crowded locations.

Manufacturer : Town Scape
Fulwood Road South, Sutton-In-Ashfield, Nottinghamshire, UK, NG17 2JZ

Production process: Factory

Dimensions (1 unit): 1,5m width x 0,9m depth x 0,6m height

Weight: 2,2 tons

Frontal resistance: N/D

Volume: 0,81m³

Installation kit content: Includes steel edge protection frame and steel forklift access points. Each CT Sentry Block has 4 No. Lifting Anchors. CT Sentry Blocks to be placed no more than 1,2m apart.

Principal materials: Concrete

Special characteristics:

Lift points are incorporated into the block design.

Pedestrian crossing plates placed at 1200mm width enable pedestrians and event goers to move freely between the blocks.

Blocks come as standard with high visibility yellow and black hazard banding. Subtler colors and bespoke branded covers are available on request.

Production (1 unit): N/D

Cost/shipping time USA/NY: N/D

Cost/shipping time QC / Canada: N/D

*Free shipping in the United Kingdom

Operation:

Machinery required: 4.5 ton rated telehandler or fork truck

Activity type (permanent/temporary): Temporary

Operating temperature: any temperature

Cleaning method: mild detergent, warm water and a stiff brush

Certified anti-terrorism: Yes

Performance details / test:

PAS 68 rated

Rating:

Security	●	●	●	●
Aesthetics	●	●	●	●
Durability	●	●	●	●
Mobility	●	●	●	●
Production	●	●	●	●
Maintenance	●	●	●	●
Other	●	●	●	●
Effectiveness	●	●	●	●

Notes:

Deployment takes around an hour for every 25 meters of perimeter security. The system is flexible enough to accommodate variations to street level, road cambers, slopes, and uneven terrain festival grounds. It enables curb to road transition and is fully customizable to available street or road widths.

The VAW range comes with an advisory service to assess the specific needs of the client's event. The system can be delivered at late notice and a representative will oversee the whole process until the product is removed.

Links:

Technical information:

<http://www.townscapeproducts.co.uk/Files/Event%20Perimeter%20Security/EPS%200001/EPS-0001.pdf>

<http://www.townscapeproducts.co.uk/event-perimeter-security>

Furniture /device

Traffic Sheep Barricades

These traffic barricades are created to look like sheep, bathed in a bright and reflective color, forming a flock that calls for greater driver attention. The sheep are also multifunctional pieces that can be used as benches, interior decor, sign holders, flowerpots and more. While their material is not strong enough to withstand a vehicle ramming into it, they can be placed in such a way to at least make it difficult to drive through a certain area.



Image courtesy of
Christophe Machet



Manufacturer: Commissioned by the Municipality Of Gland, Switzerland

Designer: Christophe Machet

Production process: artisanal

Dimensions (1 unit): 0,6m x 0,4m x 0,45m

Weight: 5-6 kg (empty) could be filled with water or sand

Frontal resistance: N/D

Volume: 0,10 m³

Installation kit content: N/D

Principal materials: Initially imagined made of concrete. It is now hollow and made of polyethylene in order to be able to burst in case of collision.

Production (1 unit): N/D

Cost/shipping time USA/NY: N/D

Cost/shipping time QC / Canada: N/D

Operation:

Machinery required: none

Activity type (permanent/temporary): temporary

Operating temperature: N/D

Cleaning method: N/D

Certified anti-terrorism: No

Performance details / test:

Developed as an artistic project made to visually alert drivers.

Rating:

The research team was unable to provide a proper rating to this project due to lack of information available.

Public Places

Furniture /device

Place De La Fontaine Chaude

This is a public space designed to enhance the pedestrian experience and promote tourism. The seating has the same pattern as the floor paving. It ensures the safety of the site in complementarity with the bollards and hydraulic terminals that are installed within its perimeter.



Images courtesy of
Okra Landschapsarchitecten BV

Manufacturer:

Designer: Okra landscape architects, Oudegracht 23, 3511 AB Utrecht

Client: City of Dax

Role: Lead designer

Collaboration: OTCE Engineering, AAPP Architects

Budget: 3 Million EUR

Dimensions (1 unit): 1 ha (phase 1), 1,5 ha (phase 2)

Principal materials: concrete

Special characteristics: N/D

Production cost: 3 billion EUR

Operation:

Activity type (permanent/temporary): permanent

Cleaning method: N/D

Certified anti-terrorism: N/D

Performance details / test: Was developed with engineers and architects to provide a safe and long-lasting design.

Notes: By reorganizing the traffic system, OKRA made it possible to create a peaceful pedestrian friendly platform. The old monumental porch of the Fontaine Chaude has recovered its position in the center of a generous, open and carefully crafted paved carpet. The paving details and lighting concept showcase and highlight the thermal history and collection of artefacts found on the square.

Links:

Articles:

<http://www.landezine.com/index.php/2015/02/place-de-la-fontaine-chaude-by-okra/>

<http://www.okra.nl/en/projects/fontaine-chaude/>

Public Places

Bermondsey Square

This public space has been designed so that it can function both occupied and unoccupied. It is located in central London and was completed in 2010. The space accommodates many events but also serves as a public space for local residents and daily pedestrian traffic. The reinvented bollards take their color from the silverware found in the silverware shops.



Image credit: Will Pryce
Image courtesy of East



Manufacturer: Igloo Regeneration
35 Dale street, Manchester, United Kingdom, M1 2HF

Designer: East Architects with the artist Jon Hares
Unit 3.3, Bayford Street Industrial Centre via Elizabeth Fry Road, London E8 3SE
Production process: factory

Dimensions (1 unit): N/D

Principal materials: Clay paving, oak beams, painted ductile iron
Special characteristics: N/D

Production cost: N/D

Operation:
Required machinery: N/A
Activity type (permanent/temporary): permanent
Cleaning method: N/D

Notes:
“Bermondsey Square is a Scheduled Ancient Monument, hosting the ruins of Bermondsey Abbey and has been home to the Bermondsey Antique’s Market since the mid twentieth century.

The brief for the public realm of this new mixed used development demanded that sufficient space was allowed to accommodate 200 market stalls for the weekly market, that the archaeology of the site was respected, and that the square was an attractive foreground to the new ground floor uses. The idea for the public realm takes its lead from the antiques market stalls; a dark, generous textural baize on which ‘trinkets’, including the new buildings and public realm furniture, are located. The texture and alignment of the clay ground material extends the site spatially beyond its edges and enhances relationships with nearby spaces such as the

churchyard to the north. The unique bollards define an open space at the heart of the Square that accommodate the weekly markets and are a delightful play attractor for children, are a comfortable seating height, and robust to withstand potential vehicle impact. The catenary lighting prevents columns from interrupting the openness. Simple oak benches positioned closely together allow generous shared seating platforms, while two single benches at either end of the square are designed to pivot to allow controlled vehicular access to the square. All foundation details and locations of drainage and furniture elements respond to the sensitivity of the abbey ruins just below the surface. Bermondsey Square was showcased by 'Blueprint' design magazine as an exemplar of urban public space in London and continues to attract a host of users from the local community and beyond. The bollards were designed in conjunction with artist Jon Hares, and they were made by Broxap in ductile iron."

*Julian Lewis, Director
East Architecture, landscape and urban design*

Certified anti-terrorism: Yes

Performance details / test: Was developed with engineers and architects to provide a safe and long-lasting design.

Rating: (based on the ductile iron device)

Security	●	●	●	●
Aesthetics	●	●	●	●
Durability	●	●	●	●
Mobility	●	●	●	●
Production	●	●	●	●
Maintenance	●	●	●	●
Other	●	●	●	●
Effectiveness	●	●	●	●

Links:

Articles: <http://www.east.uk.com/projects/landscape/public-spaces/bermondsey-square/>

Public Places

Museumsquartier Vienna

The MuseumsQuartier (MQ) in Vienna used to serve as imperial stables, therefore the entire public space is surrounded by walls and old buildings. There are six entrances into MuseumsQuartier, all open 24 hours without the need of a ticket. Most of these entrances are too narrow to enter by car, and those that are wider are protected by bollards and a heightened security check point requiring prior registration in order to enter with a vehicle.

The MQ courtyard features a variety of innovative urban furniture to increase the attractiveness of the MuseumsQuartier as Vienna's « living room. » While not designed to withstand vehicular attacks, the « Enzo » furniture, introduced after an earlier installation of « Enzis » was destroyed by a fire in Winter 2009, brought the possibility to use new technology that makes for more fireproof and resistant furniture.



Image courtesy of
MuseumsQuartier Wien,
photo by Udo Titz



Manufacturer:

MuseumsQuartier Errichtungs- und Betriebsgesellschaft Museumsplatz 1, 1070 Wien

Designer: MN*LS (Margarita Navarro and Ludwig Slezak)

Production process: Factory (newly available to purchase) by rotational molding process (hollow inside)

Dimensions (1 unit): 2,95m length x 1,16m depth x 0,93m height

Weight: 125 — 145 kg

Load: N/A

Volume: 3,18 m³

Principal materials: Polyethylene

Special characteristics: Comes in 31 different colors (when order 10 or more)

Production costs (1 unit): 2 300 EUR

Prices incl. VAT and delivery to an address in Vienna or pickup from the warehouse in Wels, Upper Austria.

Cost/shipping time USA/NY: N/D

Cost/shipping time QC / Canada: N/D

Operation: N/D

Required machinery: N/D

Operating temperature: The MQ seating can be used in all weather and in all seasons. Where possible, covering the furniture or storing it under a shelter or inside when

temperatures fall below zero in winter will help to preserve the furniture. The MQ seating should only be used out of doors.

Activity type (permanent/temporary): Temporary

Cleaning method: Any build-up of deposits caused by the weather can be easily wiped away before use. Given normal wear and tear, on the whole the MQ seating can be cleaned using a sponge cloth and an alcohol-based cleaning agent. For tougher dirt, a microfiber cloth and an industrial cleaner should be used. Apply a small amount of industrial cleaner to the microfiber cloth and clean the affected surface areas using a circular motion. Then rinse all surfaces with fresh water. Alternatively, a pressure washer can be used. Dirt will be naturally more visible on lighter colors. Should the MQ furniture be “tagged,” graffiti or markings in felt tip or ball point pen can only be removed to limited degree. We recommend using a suitable solvent.

Certified anti-terrorism: No

Performance details /test:

The MQ furniture, Enzo or Viena, is not “counterterrorism” furniture.

It is outdoor furniture with no special added security but can withstand heavy wear and tear.

Links:

<http://www.mqpoint.at/en/mq-enzos/enzo-details/?sid=8&cHash=ad58eee0f7d5dfcb4a3937edf7115243>

<http://www.mqmoebel.at/en/productinfo/>

Articles: <http://www.mnstarls.com/product.php#enzo>

Public Places

New York Stock Exchange

At the New York Stock Exchange, the conventional bollard has been replaced with sculptural bronze NOGO barriers that also provide seating and a new shallow-foundation TURNTABLE barrier replaces intrusive clamshell barriers, reopening key view corridors. The modern bench blocks and glowing towers have become visual and physical trademarks for this historic area. Adding to a cultural legacy, a long interpretive, engraved-granite curb marks the original 1620 canal, and wood block pavers recall the city's defense wall that gave its name to Wall Street.



Images courtesy of Rogers Partners
Architects+Urban Designers

Manufacturer: Unavailable
Designer: Rogers Partners Architects+Urban Designers
Production process: factory

Dimensions (1 unit): 0,76m width x 1,22m length x 0,76m height
Weight: 3039kg
Load: stop a 15,000-pound truck hitting it at 50 miles per hour
Volume: 0,70m³

Principal materials: bronze
Special characteristics: custom shapes, all different

Production costs (1 unit): 20,000 — 30,000\$ US
Operation:
Required machinery: N/D
Activity type (permanent/temporary): Permanent
Cleaning method: N/D

Certified anti-terrorism: yes

Performance details / test: Was developed with security engineers and architects to provide a safe and long-lasting design.

Rating:

Security	●	●	●	●
Aesthetics	●	●	●	●
Durability	●	●	●	●
Mobility	●	●	●	●
Production	●	●	●	●
Maintenance	●	●	●	●
Other	●	●	●	●
Effectiveness	●	●	●	●

Notes:

Links: <https://www.rogersarchitects.com/new-york-stock-exchange-financial-district-streetscapes-security/>

<http://marvelarchitects.com/project/nyse/>

Articles: <http://www.nytimes.com/2006/12/28/nyregion/28blocks.html>

<http://www.nytimes.com/2004/02/25/nyregion/a-plan-for-wall-st-security-without-the-pickup-trucks.html>

Public Places

Times Square

The project site, known as the “Bowtie,” forms the heart of the Times Square Theater District, and is bounded by Broadway and 7th Avenue between 42nd and 47th streets. Since the Bloomberg administration closed Broadway to vehicles in May 2009, and the first section of Snøhetta’s pedestrian street opened to the public in spring 2014, the transformation has already had a significant impact on public safety, economic output, and user experience. Pedestrian injuries have decreased by 40%, vehicular accidents have decreased by 15%, and overall crime in the area decreased 20%. And with the removal of vehicles, air pollution in the Bowtie area has fallen by as much as 60%, making the space safer and healthier for everyone. Over 80% of visitors now agree that the pedestrian plaza makes Times Square feel safer.



Source: <http://www.landezine.com/index.php/2017/04/times-square-redesign-by-snohetta-opens-today/>

Image credit: Michael Grimm for the Times Square Alliance.

Due to the high traffic and heavy pedestrian presence in Times Square, there were many safety and security requirements that had to be met during the design and manufacturing stage of the project. The bollards had to be removable and lockable so that authorized vehicles could access the protected area, without compromising the security of the system. Lastly, the project required shallow-mount bollards so that they would not conflict with NYC’s subway system, which sits only feet below the surface.

Manufacturer: Calpipe

Production process: Factory

Design firm: Rogers Marvel Architects (security landscaping around New York Stock Exchange)

Engineering firm: Weidlinger Associates (specialized in security reinforcement)

Other: Ducibella Venter & Santore (security consulting firm)

Total cost estimation: 55\$ million US (including the whole landscaping redesign, roadway reconstruction, and the replacement of aging water pipes).

BOLLARDS

Dimensions (1 unit): Bollard 0,76m height

Weight: N/D

Load: N/D

Volume: N/D

Principal materials: Type 316 stainless steel

Special characteristics: Possible to remove a few key bollards by twisting them off their posts to allow vehicles to pass through the palisade when necessary. The bollards blend in with other stainless-steel elements in the landscaping plan.

The Times Square Alliance approved bollards are installed in custom engineered locking embedment sleeves. They were designed and fabricated to allow for installation atop the city's sprawling underground infrastructure. A high security stainless steel lock and proprietary key was designed to accommodate existing FDNY and MTA tools. The custom lock and key required approval and review from the MTA, NYPD, FDNY and a number of other NYC agencies, in order to prevent conflicting demands and guarantee emergency access for any security, safety, fire, or medical emergency.

Embedment sleeve lids were supplied with a custom finish that improves traction and reduces the dangers to pedestrians from slipping in wet or icy weather. Equipped with lifting rings to reduce the effort required when installing or removing the bollards.

Cleaning method: wipe-downs with stainless steel cleaner
Bollards feature a tamper-resistant design to prevent theft and vandalism.

Each bollard met the following specification requirements:

- Manufactured from T316 stainless steel
- Custom geometric lock
- FEA static analysis required for each bollard
- "Buy America Act" compliant Materials Used
- 36" above grade height/ custom embedment
- #4 brushed finish
- Easily removed by two people in a few minutes
- Slipknot finish on embedment sleeve removable lid
- Adjusting locking mechanism
- Meet or exceed impact resistance requirements

Production costs (1 unit): N/D

Cost/shipping time USA/NY: N/D

Cost/shipping time QC / Canada: N/D

GRANITE BENCHES

Ten granite benches oriented along Broadway define and frame the area's public plazas. These benches act as a magnet for visitors, create an infrastructural spine for events, and provide a clear orientation device for tourists and locals alike.

Dimensions (1 unit): 15,24m length x variable width and height (5 models see above)

Weight: N/D

Load: N/D

Volume: Variable

Principal materials: Granite

Special characteristics: The linear granite barriers are parallel to 7th Avenue and double as benches. They are removable if necessary.

Operation:

Required machinery: N/D

Activity type (permanent/temporary): Permanent furniture that can be moved when needed

Cleaning method: N/D

Certified anti-terrorism: yes

Performance details / test: Was developed with security engineers and architects to provide a safe and long-lasting design.

Rating:

Based on the custom street furniture

Security	●	●	●	●
Aesthetics	●	●	●	●
Durability	●	●	●	●
Mobility	●	●	●	●
Production	●	●	●	●
Maintenance	●	●	●	●
Other	●	●	●	●
Effectiveness	●	●	●	●

Notes: Conversations with Tom Harris, from the Times Square Alliance, revealed an efficient multi-department structure that is in place to ensure the safety of Times Square's daily visitors. Beyond the great redesign of the five plazas, the Public Safety Department deploys 24/7 officers responding to visitors concerns and public disturbance. Full reports help gather data about the day-to-day alerts that may occur in order to fix rapidly any kind of recurring « trouble ».

Links:

<http://www.timessquarenyc.org/about-the-alliance/public-space-projects/times-square-bowtie/index.aspx#.WgHOLxPWxEI>

<http://www.calpipebollards.com/CSB-Projects-Times-Square-NYC/>

Video:

<https://vimeo.com/193432381>

Articles:

<https://cityroom.blogs.nytimes.com/2013/01/13/times-square-bow-tie-is-to-get-a-belt-of-steel-and-granite/>

Art Installations

Art Installations

Dreamhamar Opening Event

To celebrate this new beginning for Stortorget, organizers and designers managed to close the parking lot by simply moving and changing the use of the existing granite bollards, from being the limit of the parking lot, to becoming benches and tables for this temporary public space. It was a simple, but impressive, transformation.

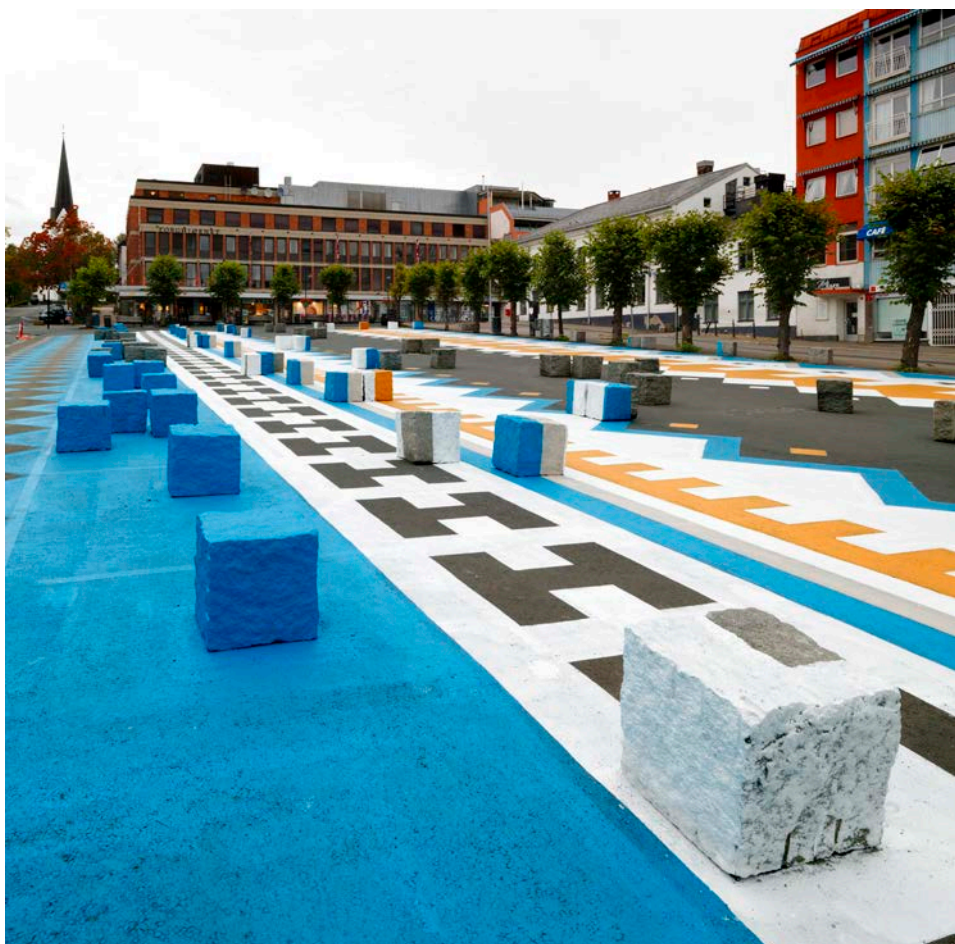


Image courtesy of
ecosistema urbano

Designer: Boamistura

Production process: factory (granite blocks) artisanal (painting)

Dimensions (1 unit): 1500m2

Weight: N/D

Frontal resistance: N/D

Volume: N/D

Installation kit content: N/A

Principal materials: Granite and paint

Special characteristics: Boamistura recreated a pattern based upon Norwegian cultural roots. It took 3 days, 52 hours of work, 120 liters of paints and 10 hands, to transform the space in a cheerful, colorful, stage for creativity and innovation. The city of Hamar gathered at Stortorget for the opening event of dreamhamar. At the beginning, no one dared to walk over the new paint, but little by little the space filled with people. The Architect firm Ecosistema Urbano invited Boamistura to make an intervention at Hamar's main square, which they were then redesigning. Boamistura have created a 1500m2 "carpet" remaking the traditional Norwegian sweater patterns.

Production (1 unit): N/A

Operation:

Machinery required: crane truck

Activity type (permanent/temporary): temporary

Operating temperature: N/D

Cleaning method: N/D

Certified anti-terrorism: no

Performance details / test:

Artistic intervention applied on concrete blocks made for traffic management.

Links:

<http://ecosistemaurbano.org/english/dreamhamar-opening-event-from-parking-lot-to-colorful-creative-space/>

Art Installations

Jewels In The City

Jewels in the city is a project that integrates pieces of giant jewelry into public spaces by integrating elements of the existing environment. It allows people to change their perception of certain devices for a few weeks.



Images courtesy of
Liesbet Bussche



Designer: Liesbet Bussche
Production process: artisanal

Dimensions (1 unit):
Weight: N/D
Frontal resistance: N/D
Volume: N/D
Installation kit content: N/D

Principal materials: N/D
Special characteristics: N/D

Production (1 unit): N/D
Cost/shipping time USA/NY: N/D
Cost/shipping time QC / Canada: N/D

Operation:
Machinery required: N/D
Activity type (permanent/temporary): temporary
Operating temperature: N/D
Cleaning method: N/D

Certified anti-terrorism: N/D

Performance details / test: Artistic intervention applied on street furniture/equipment that is made to control traffic attacks.

Links:
Articles:
<http://beautifuldecay.com/2012/08/17/liesbet-bussche-accessorizes-the-city-with-oversized-jewelry-street-art/>

Designer: http://www.liesbetbussche.com/urban_jitc.html

Added Function

Added Function

Plug A Seat

Cities are full of elements fixed to the ground that create barriers for citizens — especially bollards. However, Spanish design studio Teratoma Productions fashioned a useful function for these apparently useless elements. In its latest project, PLUG A SEAT, the firm's objective is to rethink public space through simple operations by giving these elements new meanings and creating innovative street furniture.



Images courtesy of Teratoma Productions



Designer: Teratoma Productions
Calle Valverde, 35, 28004, Madrid
Production process: factory

Dimensions (1 unit): Variable
Weight: N/D
Frontal resistance: N/A
Volume: N/D
Installation kit content: Aluminum sheet and capping (plug and play)

Principal materials: Colored lacquered aluminum sheets
Special characteristics: comes in various colors and shapes

Production (1 unit): N/D
Cost/shipping time USA/NY: N/D
Cost/shipping time QC / Canada: N/D

Operation:
Machinery required: none
Activity type (permanent/temporary): temporary
Operating temperature: N/D
Cleaning method: N/D

Certified anti-terrorism: No

Performance details / test: Project developed to be coupled with street bollards which are made to protect pedestrians from vehicular attacks.

Links:
http://www.teratomaproductions.com/00_Contact.html

Added Function



Images courtesy of
Atelier Guy architects

Jersey Furniture



Designer: Atelier Guy Architecte
229, rue St-Vallier Ouest, Québec (QC) G1K 1K3
Production process: artisanal

Dimensions (1 unit): N/D
Volume: N/D
Installation kit content: N/D

Principal materials: Wood and painted steel frame
Special characteristics: Made for 6' long concrete jerseys

Production (1 unit): N/D
Cost/shipping time USA/NY: N/D
Cost/shipping time QC / Canada: N/D

Operation:
Machinery required: N/D
Activity type (permanent/temporary): temporary
Operating temperature: N/D
Cleaning method: N/D

Certified anti-terrorism: No

Performance details test: Furniture developed to add a function to the traditional concrete jersey. Not expressly used for protection against vehicular attacks.

Links:
Articles:
<http://lepamphlet.com/2014/07/03/les-mobiliers-jersey/>

Added Function

Boll Urban Furniture

Much like Plug A Seat, the Boll devices turn existing street furniture into multi-use objects. The Boll family of objects is composed of three different modules (table, seat and backrest) that fit into the many concrete bollards that occupy the public space. It is available in several colors and in an infinity of additional functions such as that of the signage.



Image source: <https://blog-espritdesign.com/mobilier/boll-mobilier-urbain-par-adrian-blanc-33093>

Designer: Adrian Blanc
adrian@adrianblanc.fr

Dimensions (1 unit): N/D
Volume: N/D

Installation kit content: The chosen object (table, bench, backseat)
They arrive assembled to fit on the concrete bollards and are fixed by tightening nuts.

Principal materials: Painted steel sheets

Special characteristics: Different colors and shapes (table, bench, backseat, etc.)

Certified anti-terrorism: No

Performance details / test: Devices developed to add a function to a street bollard made to control traffic flow.

Links:

Articles:

<https://blog-espritdesign.com/mobilier/boll-mobilier-urbain-par-adrian-blanc-33093>

Appendix

Case Studies

New York

RogersPartners Brief: New York Stock Exchange Streetscapes and Security: <https://www.rogersarchitects.com/new-york-stock-exchange-financial-district-streetscapes-security/>

Landzine, *Times Square Redesign*: <http://www.landzine.com/index.php/2017/04/times-square-redesign-by-snohetta-opens-today/>

Calpipe Security Bollards: <http://www.calpipebollards.com/CSB-Projects-Times-Square-NYC/>

New York Times, *Times Square 'Bow Tie' Is to Get Belts of Steel and Granite*: <https://cityroom.blogs.nytimes.com/2013/01/13/times-square-bow-tie-is-to-get-a-belt-of-steel-and-granite/>

Architect's Newspaper, *Snohetta responds to Times Square pedestrian incident*: <https://archpaper.com/2017/05/snohetta-times-square-car/>

Cardiff

Marshall's Street Furniture: <https://www.externalworksindex.co.uk/entry/113935/Marshalls-street-furniture/Decorative-and-terrorist-protection-planters-Cardiff>

Marshall's Street St David's, Cardiff City Centre Case Study: https://cms.esi.info/Media/documents/550092_1366209035986.pdf

Cardiff Public Realm Manual: <https://www.cardiff.gov.uk/ENG/resident/Planning/City-design-and-public-art/Documents/Cardiff%20Public%20Realm%20Manual.pdf>

Melbourne

Australia's Strategy for Protecting Crowded Places from Terrorism: <https://www.nationalsecurity.gov.au/Securityandyourcommunity/Pages/australias-strategy-for-protecting-crowded-places-from-terrorism.aspx>

Australia National Security: Hostile Vehicle Guidelines for Crowded Places: <https://www.nationalsecurity.gov.au/Media-and-publications/Publications/Documents/hostile-vehicle-guidelines-crowded-places.pdf>

Huffington Post, *Anti-Terror Bollards Have Popped Up In Melbourne And Sydney Overnight*: http://www.huffingtonpost.com.au/2017/06/22/anti-terror-bollards-have-popped-up-in-melbourne-overnight_a_22583505/

Herald Sun, *Bollard bid to protect Melbourne's CBD from terrorist attacks*: <http://www.heraldsun.com.au/news/victoria/bollard-bid-to-protect-melbournes-cbd-from-terrorist-attacks/news-story/3481de5986df7fe027ad2e417fee1d9e>

The Age: *Melbourne 'moving quickly' to install bollards, loudspeakers and CCTV cameras for CBD security*: <http://www.theage.com.au/victoria/melbourne-moving-quickly-to-install-bollards-loudspeakers-and-cctv-cameras-for-cbd-security-20170526-gwe4pc.html>

Italian cities

Dezeen, *Stefano Boeri proposes trees instead of barriers to protect against terror attacks*: <https://www.dezeen.com/2017/08/24/stefano-boeri-tree-barriers-prevent-vehicle-terror-attacks-news/>

The Local, *Anti-terror flower pots take root in Italian cities*: <https://www.thelocal.it/20170828/idea-of-flower-pots-as-barriers-against-terrorism-takes-root-in-italian-cities>

Italian Insider, *Controversy over new anti-terrorism barriers in Italy*:
<http://www.italianinsider.it/?q=node/5797>

Abu Dhabi

Abu Dhabi Safety and Security Planning Manual: <https://www.upc.gov.ae/en/publications/manuals-and-guidelines/abu-dhabi-safety-and-security-planning-manual>

Other Additional Readings and Resources

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<https://www.voanews.com/a/european-cities-security-public-spaces/3898654.html>

International Downtown Association: *Downtown Districts at the Table: Planning for Safety and Security*: <https://www.ida-downtown.org/eweb/DynamicPage.aspx?expires=yes&WebKey=4f3d15ae-20cd-4d79-a478-ed3fa816a9fd>

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PublicSpace.org, *Architectures of fear: Terrorism and the future of urbanism in the West* : <http://www.publicspace.org/en/text-library/eng/b026-architectures-of-fear-terrorism-and-the-future-of-urbanism-in-the-west>

Journal of Terrorism and Political Violence, *Visible Counterterrorism Measures in Urban Spaces—Fear-Inducing or Not?*: <http://www.tandfonline.com/doi/full/10.1080/09546553.2014.930027>

International Arts Manager, *Why won't the arts and entertainment industry talk about the threat of terrorism?*: <http://www.internationalartsmanager.com/blog/its-about-time-we-started-talking-about-terrorism-in-the-arts-and-entertainment-industry.html>

Hacking Urban Furniture: <http://www.hackingurbanfurniture.net/research/>

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