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Anti-terrorism design and its effects on society

By

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I declare that this **Critical Cultures Research Project** is all my own work and that all sources have been fully acknowledged.

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Contents

List of Illustrations

10. Davis Landscape Architecture, *Trees lining path*, 2018, 130mm x 174mm Photo [online] Available at: https://davisla.wordpress.com/2014/01/14/grand-canal-square-dublin-ireland/ (Accessed 19th January 2022) pg. 30

11. O'Connell. T, *Bulletproof glass fronting at the Eiffel Tower*, Paris, 2021, 130mm x 95.7mm Photo, Dublin, Pg. 34

12. Societe d'exploitation de la Tour Eiffel, *Graphic showing the security perimeter with glass walls and fences around the Eiffel Tower*, 2018, 130mm x 111mm Photo [online] Available at: https://abcnews.go.com/International/eiffel-tower-installing-bulletproof-glass-walls-protect-monument/story?id=55888573 (Accessed 28th January 2022) pg. 34

13. J Mitchell. Jeff, *French troops patrol around the Eiffel Tower in Paris on Jan. 12, 2015*, 2015, 130mm x 112mm Photo [online] Available at: https://time.com/3664097/charlie-hebdo-paris-attacks/ (Accessed 28th January 2022) pg. 37

Introduction

The War on Terrorism, often known as the 'War on Terror' or the 'Global War on Terrorism,' has become an international phenomenon and an armed campaign initiated in the aftermath of the 9/11 attacks on the United States' twin towers. According to John Lewis Gaddis, the post-cold war began on November 9, 1989, with the collapse of the Berlin Wall, and ended on September 11, 2001, with the fall of the World Trade Centre (Talbott and Chanda, 2009). Paul Bracken describes this new era as the era of "thinking the unthinkable," which has become a common phrase when discussing our lives in a terror-stricken world (Talbott and Chanda, 2009).

A growing body of literature recognises the importance of "thinking the unthinkable"; however, how far should designers of the built environment and society take this slogan? The issue of anti-terrorism design has received considerable critical attention; how can we harden our surroundings while protecting the people who inhabit it from psychological and physical damage?

When examining the subject of terrorism, we must set a base understanding of the term. While there is no universally agreed definition, the Federal Bureau of Investigation defines terrorism as the "use of force and violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof" (Federal Bureau of Investigation, 2021, n.p).

Terrorism is often perceived as a righteous fight for a higher cause, so it is necessary to consider how countermeasures are taken. There are many different counter-terrorism methods on several levels. The author will hone in on that of the built environment, looking at how target areas can be secured in a physically and psychologically comfortable way for the inhabitance and users.

This thesis offers the first step towards a deeper understanding of the connection between the threat of terrorism, the physical environment, and the users of the domain. The first chapter will examine the practice of assessing risk, breaking down the three essential parts, threat analysis, asset analysis, and vulnerability.

The second chapter seeks to address the problem of terrorism by examining how designers reduce the vulnerabilities of spaces, ensuring an effective response to the challenges of terrorism.

Finally, chapter three will conclude with an in-depth comparative study of Grand Canal Square in Dublin, and the Eiffel Tower, in Paris. Chapter three compares an environment to a ‘text’, discussing how the designer or ‘author’ of a space, leaves conflicting or confusing messages underlying security features. Here the psychological impact of counter-terrorism design on civilians is discussed, and alternative security design approaches are suggested.

Chapter 1 - Assessing Risk

1.1 - Background

The ability to analyse and manage risk is critical for today's law enforcement and designers. This ability is instrumental for law enforcement operations in the post 9/11 era. Failure to assess and manage terrorist threats could have catastrophic effects (Zilbershtein, 2005). When designing for the built environment, to protect and serve the people that use it, it is essential that we do a risk assessment to understand the effects of an attack. Risk assessment and management methods are evolving rapidly. Although models differ in how steps are defined, labelled, and sequenced, there is broad agreement on the key components. We can break down a risk assessment into three essential parts, threat analysis, asset analysis, and vulnerability analysis (Leson, 2005). However, other factors such as critical infrastructure, key asset inventory, and countermeasure identification also play an integral role.

1.2 - Threat Analysis

Terrorism is the product of political, sociological, and ideological factors (European Commission, 2020). The Global Terrorism Database defines terrorist attacks as: "The threatened or actual use of illegal force and violence by a non-state actor to attain a political, economic, religious, or social goal through fear, coercion, or

intimidation" (Global Terrorism Database, 2021, n.p). When determining the risk of terrorism, it is important to consider international developments such as civil wars, clash in ideologies, conflicts that leave people impoverished, migration, and radicalisation (European Commission, 2020). When there is military, economic, or political positioning by the national government, such occurrences impact a local level creating a breeding ground for terrorism (European Commission, 2020). Terrorism is associated with fear. According to empirical evidence, it is one of the most anxiety-inducing hazards (Slovic, Fischhoff and Lichtesntien, 1980). In recent years, terrorism has slowed down, while the severity of attacks has become more lethal (Pillar, 2003).

In Europe, if we are to trace the past trends, we see mostly ethno-nationalist/separatist terrorist attacks; however, this is, by several cases, not victims and socio-psychological impact (European Commission, 2020). Similarly, jihadism follows behind, with the most significant amount of victims. The chart below shows Europol's terrorism trend forecasts, which provide statistics and a general overview of the threat from 2015-2018 (Figure 1).

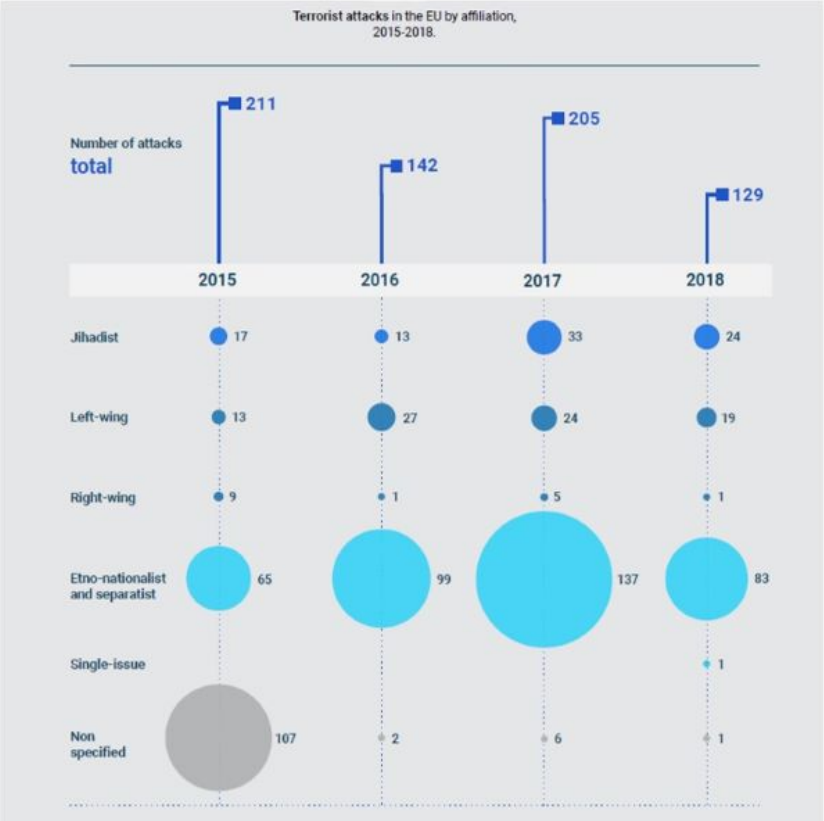

Fig. 1 Terrorist attacks in the EU by affiliation 2015-2018 (European Commission , 2020).

These comprehensive analyses and statistics provide a broad perspective on current terrorist tendencies and set the stage for evaluating local circumstances. There are also "softer" techniques that can help identify threats by indicating sociological dynamics. For example, the European Commission's Europe Media Monitor can be used to examine the use of terrorism-related keywords in media and social media channels. However, these technologies can generate a lot of "noise" and should be used with caution. Still, they can provide potential terrorist intentions, as well as social attitudes around the threat of terrorism (Chinosi and Steiner, 2021).

Having looked at the terrorism trends forecast, it is vital that we understand the various attack methods that terrorists use. Terrorists have a vast range in methods, with bombings being the most common form of attack, as explosives are easily obtained and are theatrical. Other acts of terrorism have included hijacking, assassination, hostage-taking, armed assault, product or air contamination, and cyber-terrorism (Craighead, 2003). Other forms of terrorism involve the use of vehicles that, at high impact, have explosive properties, for instance, using aeroplanes as missiles in the 9/11 attacks (Craighead, 2003). More recent events have seen motor vehicles becoming the weapons of choice, as trucks and vans are driven into public crowds and used as rams; this is called "vehicle contact" (Petulla, 2017). Erin Miller, program manager for the Global Terrorism Database, states that vehicles are often just one component in an attack, "Vehicles are used in concert with other types of weapons," as the drivers leave their vehicles and pursue further casualties on foot (Petulla, 2017, n.p). Vehicles are also being used in conjunction with explosives, as they are "used specifically to breach security or get past a gate," where explosives can later be detonated to have a large casualty count (Petulla, 2017, n.p)

Despite all the trends of conventional weapons, biological, radiological, chemical, and nuclear weapons can not be dismissed. Similarly, when looking at a threat analysis, it is crucial to consider the effects of several sequential attacks on an environment. Further to this, suicide attacks must be considered as they change the

defence tactics implemented by authorities and designers (Pillar, 2003). Advancements in technology have also opened up new opportunities for attack methods, as readily available drones can now carry explosives and other destructive components like chemicals into previously unreachable places. These advancements bring new threats and vulnerabilities to our spaces (Pillar, 2003). So how can we stop attackers from perpetrating a space and hinder them from destroying the area in which they are stopped? For terrorists, fear is perpetuated by the coverage of media outlets who document the mass casualty counts and destructed environments; this exemplifies the power over the authorities (European Commission, 2020).

1.3 - Asset Analysis

With the threat analysis and attack methods established, the asset analysis must focus on the particular attributes of the public space during its everyday use and during its use for an event that makes it a potential target. In today's built environment, there are endless targets. Having in mind the distinct effect terrorists want to have on society and the authorities, to create fear through mass destruction, we can presume the areas of particular threat are those that present mass casualties, religion, and symbolic beliefs, and those that support the economy (Kozlow and Sullivan, 2000). The analysis can be based on attack scenarios already encountered elsewhere. For the most part, when examining an example of a terrorist attack, we can see that the act fits this outline. The most notable is that of the

9/11 attacks. This particular attack targets the twin towers of the World Trade Centre, buildings of great economic significance. This created mass destruction of the environment, also producing huge casualty numbers.

Similarly, in the European context, on July 14, 2016, in Nice, France, a 19-tonne cargo truck was deliberately driven into crowds of people celebrating Bastille Day on the Promenade des Anglais. This resulted in the deaths of 86 people and the injury of 458 others. This was the doing of jihadist terrorism (History, 2021). This event targeted ordinary people commemorating a day of symbolic value, making it an appealing target for terrorists who have shown that they are more prone to target places that are easily accessible, regularly available, and have the potential to impact beyond death. This event will be explored further in chapter 3. It is suggested that the areas of future targets present mass destruction but target the everyday activities of people. Attacking the places that we engage in regularly like shopping centres, schools, hospitals, and transport facilities would impart fear into the regular person, causing social unrest (Zilbershtein, 2005). As seen before, at the Ariana Grande concerts, Manchester attack, there is also scope for the attack of concert and sports venues, where people attend at a set time in an orderly fashion.

1.4 Vulnerability Analysis

A vulnerability assessment evaluates the weaknesses of a potential target that a terrorist can exploit. Assessing vulnerabilities in the context of attack scenarios can help authorities develop effective deterrence and mitigation techniques and initiatives to protect people, critical assets, emergency management plans, and increased resilience (Leson, 2005). Vulnerabilities are specific to different settings and possible threats; they should include operational, structural, and contextual considerations. The EU Vulnerability Assessment Checklist outlines several elements to examine and practical questions to ask when assessing the vulnerability of various public places in light of different threats. Figure 2 below highlights some of the components that must be considered when determining the vulnerabilities of a place.

Fig. 2 Vulnerability Assessment Components (European Commission, 2020).

Many facilities, such as performing theatres, museums, and sports arenas, provide the opportunity to develop thorough checkpoints because they require permits or tickets to enter. However, there is nothing to stop an aggressor from purchasing a ticket to an event such as a sports game or theatre show. In contrast, facilities that provide services to the general public "cannot be hardened easily, since hardening them would be against their primary users - the public" (Combs, 2017). These facilities include transport terminals, healthcare, government buildings, shopping centres, and public museums. For public spaces, it is crucial that continuous, systematic risk assessments are carried out to prioritise, plan, and execute effective mitigation solutions (European Commission, 2020). There are no attack-proof solutions in practice, and moreover, there is no 'one fits all' approach to designing out terrorism. Terrorists, on the other hand, want to cause the most devastation with their attacks, so they'd naturally be drawn to exploiting the exposed weaknesses of public locations. Implementing mitigation measures that address systematically assessed risks will boost resilience in the event of a terrorist attack, and its existence will serve as a deterrent to terrorists (Zilbershtein, 2005).

Chapter 2 - Addressing the problem

2.1 - Background

To ensure an effective response to the challenges of terrorism, in January 2016, Europol created the European Counter Terrorism Centre. An operations centre and hub of expertise that reflects the need to reduce Europe's vulnerabilities to terrorism; and minimise the damage and recovery from attacks that occur (European Counter Terrorism Centre, n.d.). Europol's strategy for countering terrorism is based on establishing priorities to deal with the matter. The use of physical methods to minimise terrorist risks, such as structural hardening, operational protection, intelligence, and even deception, must be prioritised rationally. When we consider facilities of a public nature, the importance of this criteria is highlighted: the users' perspective. When we regard the architectural environment as a provider of physical and physiological comfort for its users, factors such as image and functionality become crucial.

The following sections review the current literature on reducing the risk of terrorism and the tactics used to achieve this goal via the built environment.

2.2 Reduction of vulnerability

Given that terrorism is the new war of our time, it is fair to assess the existing physical security of facilities in light of history (Zilbershtein, 2005). History has shown the use of two main strategies, impediment and deterrence. An impediment is to physically hold back an attack, while deterrence creates an image that psychologically discourages potential terrorists from attacking (Healy, 1968). Deterrence translate to rigid appearances of fortification. In modern times, both tactics of impediment and deterrent have been used to prevent crime. The feeling of fortification given by these approaches can have huge tangible effects on a user's psychological comfort (Coaffee et al., 2009). This has heightened the need for cities to change how they are designed. Checkpoints, bollards, and choke points aid authorities in preventing terrorism, but there are other ways that are less visible and more integrated into the public realm.

When looking at the past and present methods of thwarting terrorism through means of deterrents and impediments, the concern is raised that perhaps terrorists may simply attack other softer and more porous areas. Meaning that the crime is more so displaced and not discouraged, so the overall rate at which crime occurs is not reduces (Tijerino, 1998). Likewise, how an aggressor may act can shift in methods or timeframe. It has also been noted that areas that receive excessive security and fortification can be more appealing to possible attackers (Poyner and Fawcett, 1995). This is because all

the excessive security measures suggest that there is something important to protect. It's also important to remember that deterrence is based on perception. A particular image may impact the actual users of the environment too.

These violent terrorist interdiction come at a sensitive time, amid a resurgence of urban riding and new efforts to stimulate social connection in public spaces, especially at a time when people are becoming increasingly more and more separated by their mobile phones and computer screens. People are encouraged to exercise and drive less due to more appealing parks, improved sidewalks, and new dedicated running and cycling paths. Protecting these vulnerable public places and facilities is proving problematic since, unlike buildings, outdoor spaces do not operate until they feel welcome, open, and appealing - in contrast to the "fortress" impression that barriers might evoke. Following the notion that excessive security measures can have tangible effects on the intended user of a space, it can be said that a complicated relationship exists between the importance of security and how secure a person actually feels in that environment, "Where security systems assert themselves most forcefully, fear, discomfort, and danger often flourish. Conversely, the absence of visible protection can promote the feeling of well-being" (Ivy, 2022, n.p). According to psychologist Farson (Ivy, 2022), extensive security measures may make the users of a space fearful, even tho the measures offer protection from threat. The issue of security measures visibility,

perceived image, and resulting responses require much more investigation.

2.3 Impeding attacks: Design response

In recent times, designers and design companies behave in more socially responsible ways, to do good for society. Designers are seen to use their skills in response to social issues and public perception (Savičić and Savic, 2013). The power of design to illicit change in behaviour has received increased interest; however, the way a user might experience that influence is rarely discussed, as it may not impact the effectiveness of the design intention (Savičić and Savic, 2013). It is understood that the implementation and intention of design can be coercive, persuasive, seductive, and decisive in influence (Tromp, Hekkert and Verbeek, 2011). Unfortunately, the users of a space only seem to be hindered when the measures taken to protect and serve them are highly visible and somewhat intrusive. This is referred to as an unpleasant design. Generally speaking, unpleasant design aims not to harm the users of public space, as we all want our streets, parks, and meeting points to be pleasant. However, in order to make them more appealing to the majority of people, we must make the place unpleasant to some minority groups, such as terrorist's (Savičić and Savic, 2013).

When designers are tasked with the challenge of blending counter-terrorism security measures with urban design principles, there is a

lot to consider. For instance, installing physical measures to a streetscape must prevent hostile vehicle access while remaining permeable to pedestrians and accessible to all. It is also important that designers are not overly sensitive to risk, resulting in bland and standardised spaces that tarnish the look and feel of the area. Bespoke solutions are brought about due to different locations presenting unique challenges. As established, there is no "one size fits all" approach (Government of the United Kingdom, 2012). As a general rule, the application of positive features such as planters and trees attract people to spaces whilst assisting in the security against some types of terrorist threats. To have a sensitive response that elicits a minimal reaction from the public, a combination of hidden measures can be taken. The result may blend some invisibly integrated standardised components based on conventional traffic management and streetscape designs, such as structurally enhanced bus shelters, lamp columns, benches, or bike racks. Likewise, elements of some purpose-designed solution incorporating public art or locally important features can be installed, creating physical measures that prevent access, make pinch points and slow the movement of people down (Government of the United Kingdom, 2012). The use of these tactics does not diminish the feel of a space, if not even enhancing the environment by serving as multifunctional tools, both protecting and carrying out the intended use of the products. A bike rack, for example, impedes entrance to cars while serving as a locking bay for pedestrian bikes. The power of these

design tools has enabled designers to keep people from harm's way while not imposing on anyone's psychological comfort.

Chapter 3 - Comparative Case Studies

3.1 - Case Study 1 | Grand Canal Square, Dublin

If we take the example of Grand Canal Square, an exciting urban space located at the western end of the Grand Canal Dock, we can see all these examples of pleasant counter-terrorism measures and then some. Grand Canal Square, the heart of the Docklands for many, is a 10,000 square metre bustling hive of activity, as seen below in figure 3. It offers so much to the public, with people occupying the space for business, picnics, and drinks, as well as theatre and lots more.

Fig. 3 Grand Canal Square (Daft.ie, 2022)

Although there is no major concern and likely hood of a terrorist attack in Ireland, the Grand Canal outdoor space stands as a threat in the circumstance that terrorism was to strike (Vision of Humanity,

2019). It is overlooked by the Bord Gais Energy Theatre, Irelands largest fixed seating performing arts venue. Here, guests can be seen to arrive in a predictable manner and at a particular time, making it susceptible to threats. This enables terrorists to target regular people and produce mass casualties, imparting fear on the ordinary population. On a recent visit to the Bord Gais Energy Theatre, the author examined the behaviour of those attending. A recent field observation to gain an understanding of people's behaviours noted that people formed a queue that spanned the entire length of the square. The queue was contained behind bollards, planters, and a sculptural light display, all acting discretely to keep the attendants out of harm's way, see Figure 4 below.

Fig. 4 The queue of people contained behind bollards, planters, and a sculptural light display at Bord Gáis Energy Theatre (O'Connell, 2021)

At Grand Canal Square, good urban design has designed out this risk of terrorism, making it not only a safe environment but an inviting one. In 2008, the space was masterminded by leading American landscape architect and designer Martha Schwartz. The images figure 5, 6, and 7, present many benches, trees, bike stands, and planters that create a highly sheltered yet open space. It also teases with the idea of a highly geometric shaped bench and planter section that ultimately breaks up the open area by being arranged diagonally across the square, barricading the public in from any hostile vehicles. The planter bench also creates pinch points that slow people's movement down, allowing law enforcement to easily hone in on suspected aggressors.

Fig. 5 Image showing the fixed seating located around the square perimeter. (Davis Landscape Architecture, 2018)

Fig. 6 Image showing the raised planter section that is arranged diagonally across the square (Davis Landscape Architecture, 2018).

Similarly, the space is further broken up by using illuminated red poles that extend into the water. The dotting of these polls creates an attractive and inviting space as they glow while impeding access to vehicles. As seen below in Figure 7, the combination of these security measures has created a full 360-degree barrier around the perimeter of the square. The work of urban designer Martha Schwartz exemplifies the fact that good design can design out terrorism while going unrecognised by the public.

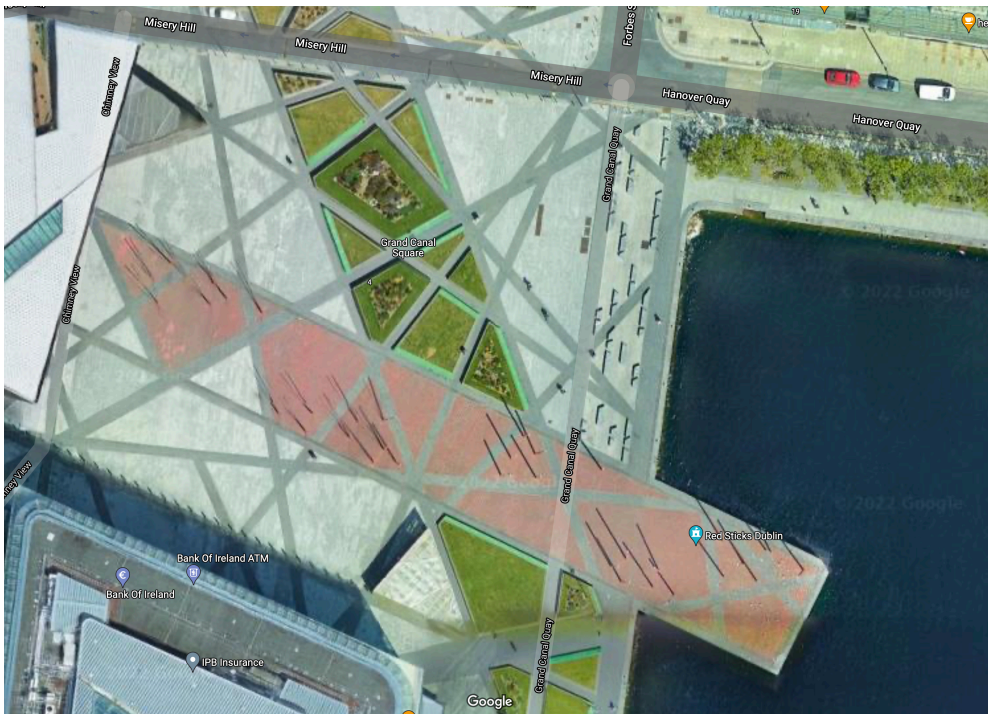

Fig. 7. Aerial view of Grand Canal Square, showing the different security measures and components that make the space (Google Maps, 2021).

Implementing these hidden anti-terrorism components is not tasking on the public's psychological comfort, as they elevate the space by offering function and character. Inside the central square, this statement is supported as it offers many different activities and societies. During the summer months, different social groups such as 50 First Skates, an Irish skate club, and Quedadas Salseras, a salsa group , meet to celebrate the pleasant design of the place by thriving in the inviting environment (see Figure 8).

Fig. 8 Quedadas Salseras, salsa group occupying the square (Quedadas Salseras, 2021)

When discussing the design of a space or environment, the word pleasant is commonly used. Because of its general, positive nature, it is one of our most basic descriptors (Rothstein, 2013). Emotions are important to us but are difficult to put into words. However, expressions such as excitement, fury, and love are superlative emotions that we recognise as pushing the boundaries of common human experience; we hope those pleasant sentiments are more inherent in everyday life (Rothstein, 2013). A plateau, on the other hand, is pleasant. It is a state we would like to achieve over extended periods, representing not just a fleeting moment or event in our lives but a means of extending a larger system or network of systems (Rothstein, 2013).

To further assist in protecting those that occupy the Grand Canal Square, the approaching access roads have been considered.
To mitigate risk, the focus has been put on ensuring permeability for pedestrians by having a widened footway. Vehicles cannot enter the access points as they are met by removable bollards that both the city council and law enforcement have access to. The use of physical measures is localised and effective in helping prevent unscreened vehicles from getting within close proximity to the square. As seen in figures 9 and 10, bollards and trees line the access points and paths; this inhibits vehicles containing potential improvised explosive devices, separating them from the buildings, meaning there is less focus on a building's form and fabric (Government of the United Kingdom, 2012).

Fig. 9 Bollard markings (Davis Landscape Architecture, 2018)

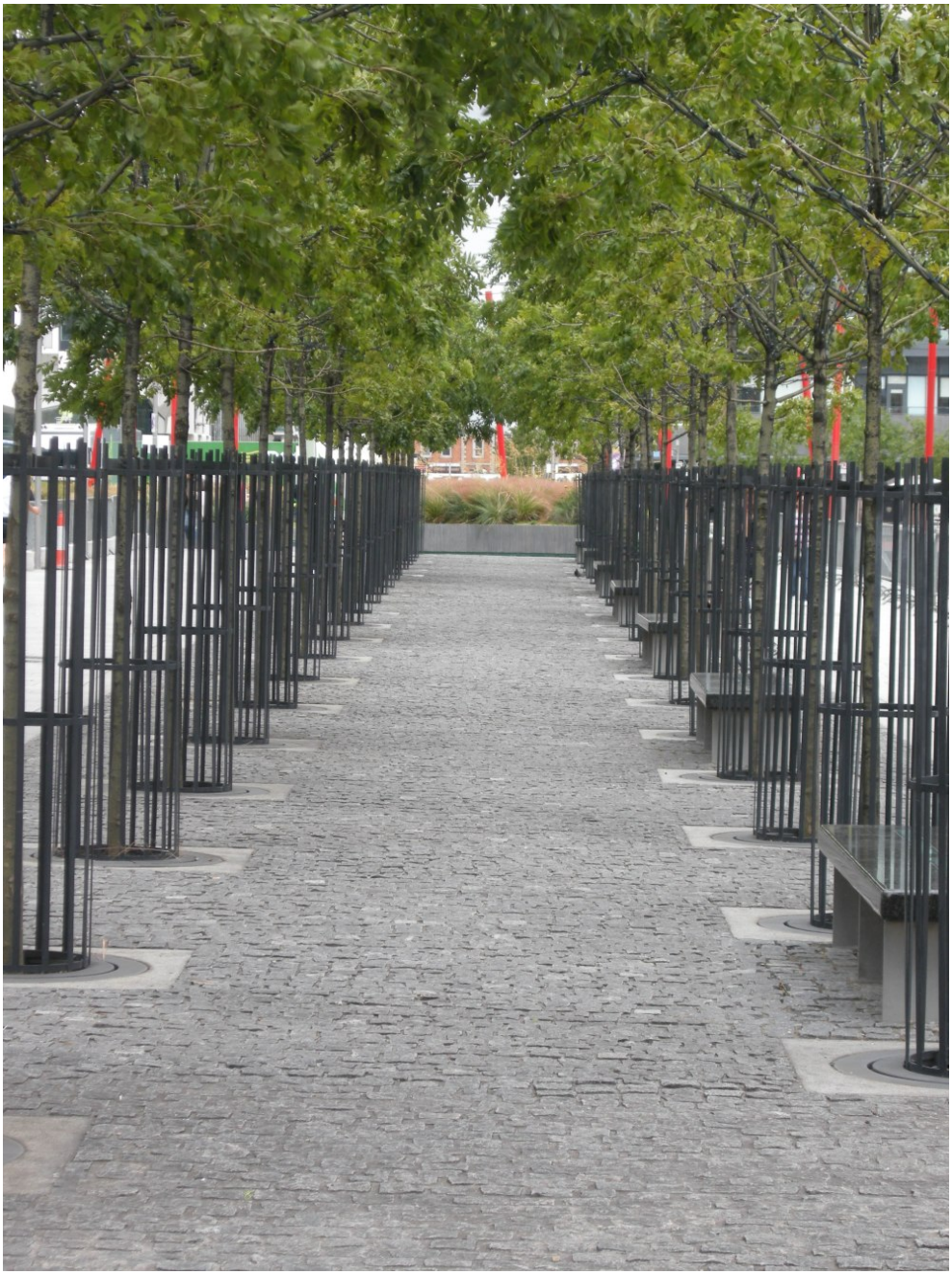

Fig. 10 Trees lining path (Davis Landscape Architecture, 2018)

3.2 - Case Study 2 | France

Having established the successful design of Dublin's Grand Canal Square, it is essential to compare and contrast this to something regarded as an unpleasant design. For the author, this takes us to

the case study of France. Just six years ago, on Bastille Day, the seafront of Nice turned from a place of celebration to despair as a man driving a truck rammed through crowds watching fireworks. A total of 86 individuals were killed, with 10 of them being children and 458 others injured. After a 2km rampage down the Promenade des Anglais, Mohamed Lahouaiej-Bouhlel, a Tunisian-born attacker, was shot and killed during a gunfight with police. The extremist group known as Islamic State claimed responsibility for the incident, alleging that Lahouaiej-Bouhlel had responded to their call to arms. However, prosecutors claim there was no proof Bouhlel had pledged allegiance to the extremist group. The attack was part of a wave of terror strikes by jihadists across France. It happened less than a year after 130 people were killed in bombings and shootings across Paris in November 2015, including the Bataclan concert hall victims (Euro News - Sandrine Amiel, 2021). According to France's domestic intelligence agency, terror attacks in France have killed 264 people and injured another 1,200 since 2014. As a result of these events, fear of terrorism has dominated life in France. Disruptive events contribute to a social climate of fear and escalate societal uncertainty. On the days following the terrorist attacks and mass shootings, Paris documented a rapid increase in post-traumatic stress disorder and acute stress reactions, as well as depression (Vandentorren et al., 2016). The attacks prompted a significant increase in internal security spending, with French President Francois Hollande pledging more than $850 million to combat terrorism (Ray, 2021).

The author believes that the fear experienced by the inhabitants of France is perpetuated by the constant exposure to visible counter-terrorism security tactics. The study is motivated by concerns that intrusive security measures can drastically alter public perceptions of space and, in certain situations, lead to planned and inadvertent exclusionary behaviours or a variety of undesirable emotional responses. Terrorist defence measures in urban areas have traditionally relied on territorial interventions to isolate and monitor particular public and private locations that are considered targets. However, more recently in France, a significantly broader range of crowded public places have been identified as potential targets, requiring increased security. This has far-reaching ramifications for how people interact with the 'everyday' urban environment (Coaffee et al., 2009). In France, anxiety runs high as it is argued that the targets of terrorists have been expanded to include a range of crowded places with the expressed interest of inflicting mass casualties (Coaffee et al., 2009). Throughout France, the use of various security measures have been implemented. It protects the people and mitigates the risks of possible attacks. However, the urban landscapes can now be portrayed as texts that can be read, revealing a range of interpretations of the conflict, war, and terrorism more culturally sensitively (Coaffee et al., 2009). According to postmodern and poststructural theories, landscapes are seen to become a medium through which social relations and processes are constructed and reproduced (Daniels, 1993). Similar textual studies were employed to analyse the spike in urban fear in the 1990s,

recognising that visual aesthetics came to symbolise conflict, violence, and terror. Prior research has also shown how symbolic markers of territorial war, such as anti-terrorism features or combat memorials, create highly symbolic and frequently contested landscapes (Johnson, 1995).

Taking the example of the Eiffel Tower on the Champ de Mars in Paris, temporary barriers were erected in 2016, following the series of terrorist attacks that put France on high alert. More recently, we saw the implementation of permanent counter-terrorism measures in 2018. The Paris site has been retrofitted with a new bulletproof glass fronting to protect itself and visitors from potential terrorist attacks. The glass panels are approximately ten feet tall and two inches thick, as seen in Figure 11. They run parallel to the Seine River and at the monument's north and south ends, Avenue Gustave-Eiffel. Figure 12 below, shows that metal fencing has also been built on the east and west borders to prevent vehicles from ramming into the grounds.

Fig. 11 Bulletproof glass fronting at the Eiffel Tower, Paris. (O'Connell, 2021)

Fig. 12 Graphic showing the security perimeter with glass walls and fences around the Eiffel Tower. (Societe d'exploitation de la Tour Eiffel, 2018)

Security features, particularly those intended to prevent, deflect, or mitigate a terrorist attack, are 'transacted': they are projected or transmitted (both intentionally and unintentionally) by the state and security services, but also consumed or received by the general public and other observers (Coaffee et al., 2009). It can be argued that such transactions - between the transmission and receiving of messages - are riddled with contradictions. The messages underlying security features might be conflicting or confusing, especially when viewed through the lens of their 'visibility' to their intended audiences. These inconsistencies highlight the subjective nature of counter-terrorist action interpretations. Secure landscapes, for example, the bulletproof glass that protects the Eiffel Tower, is an obvious and intrusive security feature that 'advertises' the message that the location is fortified. This sends two messages. The public is 'told' that the location may be used safely, while would-be criminals are 'told' that their malicious intent is likely to be futile or at least require a significant amount of work. However, there is a potential conflict in these assumptions. While security regimes may strive to comfort the public by 'transmitting' sentiments of safety and security through the built environment, the reception of these messages may be lost in translation. Ironically, security features like this may elicit feelings of fear and anxiety by attracting attention to the idea that one's safety and security are in jeopardy (Coaffee et al., 2009).

Although visible anti-terrorism measures may take away from the space, a paradox is found between them and invisible features. As

the threat of an attack is high, invisible security features may invert the contradictions that have been outlined so far. They may potentially present the site as being insecure. Therefore, the statutory institutions protecting the public are made prone to allegations that the threat of terrorism is not being taken seriously enough. So perhaps this means that a blended approach of visible and invisible measures is appropriate to not design in oversensitivity and fear. This could mean providing security as a streetscape enhancement and public realm beautification, rather than a separate or redundant system of components whose sole function is security. At the same time, expanding the palette of components in an area can provide tasteful perimeter protection while avoiding the monotony of endless lines of barriers or bollards, which only suggest defensiveness.

Further to this, unlike Dublin's Grand Canal Square, the bulletproof glass front that protects the Eiffel Tower does not allow for the free movement of people. Chokepoints have been created to slow people down at security checkpoints. The hardened border has removed the sense of an inviting space, unlike that of Grand Canal Square. In addition to the heavily fortified Eiffel Tower, this must also contend with the 'guns, guards, gates' posture adopted after 9/11, which is inappropriate. Owing to the way such measures actually intensify and reinforce public perceptions of siege or vulnerability, thus heightening the sense of imminent danger and anticipation of attack (Coaffee et al., 2009), see Figure 13 below.

Fig. 13 French troops patrol around the Eiffel Tower in Paris on Jan. 12, 2015 (J Mitchell, 2015)

Conclusion

The desired intention of this thesis was to set out and examine security measures and their potential to drastically alter the public perceptions of space in the context of today's terrorism proliferation.

The first chapter examined the practice of assessing risk, breaking down the three essential parts, threat analysis, asset analysis, and vulnerability. The second chapter sought to address the problem of terrorism by examining how designers reduce the vulnerabilities of spaces, ensuring an effective response to the challenges of terrorism. A study of the threat and its relationship to the built environment was conducted to gain insight into the efforts to combat terrorism in the design world. Finally, chapter three concluded with a comparative case study of the Grand Canal Square in Dublin, and the Eiffel Tower, in Paris. In this study, the Grand Canal Square represented the positive implementation of counter-terrorism methods, whilst the Eiffel Tower study highlighted the psychological impact of unpleasant counter-terrorism design on civilians. Alternative security approaches were suggested.

While any attempt to forecast the unthinkable is difficult, future terrorist targets will certainly include sites that combine two fundamental features. The first consists of infrastructures that support daily operations and, if attacked, might cause widespread concern and dread among the general public. The second

characteristic concerns the number and importance of facilities, particularly those that could result in mass casualty incidents and significant destruction and injury to infrastructure.

The historical foundations for physically stopping potential criminals have shown to be particularly relevant to the current defence against terrorist threats. The barrier to a terrorist assault begins with defining the controlled/uncontrolled zones, fortifying controlled regions, and safeguarding all access points. Another classic defence strategy and a primary crime-prevention strategy, deterrence, takes a new twist. We are dealing with criminals who have a different agenda than typical criminals. Terrorists, unlike criminals, are not afraid of being caught or killed in the act, and they may desire conditions that are deemed deterrents in the criminal justice system (e.g., presence of crowds).

As has been reiterated throughout this thesis, intervention with the use of counter-terrorism features can be read in our streetscapes, impacting the use of everyday urban spaces. These interdictions transmit a powerful message, both intentionally and unintentionally, eliciting a range of emotional responses. As a result, the design of counter-terrorism measures in a space can impact how we interact with it and others. The thesis has uncovered a range of conflicting transactions and messages found in the security measures taken. The policies that thwart terrorism are predominately 'authored' by the state's security services, and are 'read' by the people who occupy the

space, often assuming the unintended messages (Coaffee et al., 2009). As shown, despite declarations that the state's primary responsibility is to protect its citizens, safety components and designs can have the exact opposite effect: tearfulness, distrust, paranoia, isolation, and, finally, insecurity. In this case, the government's response may help terrorise the same people it is supposed to protect. As a result, while considering the acceptability and effectiveness of security features, it is important to keep in mind that there is some room for flexibility. People's tolerance for intrusive security or, alternatively, their desire to feel more secure can change with time, as does the source and target of threats.

To conclude, while invisible security may be more aesthetically pleasing and provide a solution to the many problems of more evident and invasive security interventions in the built environment, we must approach the design of our spaces with caution.

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Fig. 11 O'Connell. T (2021) *Bulletproof glass fronting at the Eiffel Tower, Paris.*

Fig. 12 Societe d'exploitation de la Tour Eiffel (2018) *Graphic showing the security perimeter with glass walls and fences around the Eiffel Tower.* [online] Available at: https://abcnews.go.com/International/eiffel-tower-installing-bulletproof-glass-walls-protect-monument/story?id=55888573 (Accessed 28th January 2022)

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