SECURITY ASPECTS OF URBAN PLANNING AND DESIGN - "THE EUROPEAN MODEL"

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ABSTRACT

The permanent development and modernization of urban infrastructure over the last few decades have been crucial in increasing the vulnerability of the community.The need to minimize security risks (urban violence, terrorist attacks) is particularly pronounced when urban planning and designing everyday social environments. The goal pursued by urban planners is to create a positive security atmosphere (perceptual or realistic) through strategic partnerships and cooperation policies between municipal, city and national levels of government. This model (so-called: "European model") of urban planning has been implemented in several European countries (such as Belgium, France, Germany, Italy, Spain, United Kingdom) to improve the quality of living conditions in populated urban areas. Urban planning and design implies the analysis and incorporation of safety security elements in the form of specific functional barriers in the public space. Using sophisticated computer software(*Vulnerability Identification Tools for Resilience Enhancements of Urban Environments,* VITRUV), urban planners can accurately identify and analyze security risks and their damages, and offer the right solutions. The aim of this paper will be to describe the security aspects of urban planning and design, and the efficient use of public space to improve the security situation with minimal disruption to everyday social ativities.

KEYWORDS _ *urban infrastructure, urban planning and design, security risks*

INTRODUCTION

Preserving the openness and freedom of public space in European cities for all citizens and visitors is a priority for urban security managers, political officials (at local, regional and national levels), architects and urban planners. Increasing terrorist attacks and increasing crime in urban areas require appropriate security measures, such as metal fences, barricades, traffic pillars, or standards that combine Situational prevention - or Crime Prevention through Environmental Design. In addition, the increased frequency of natural disasters (caused by climate change) indicates the necessary cooperation of city leaders, urban designers and architects and, of course, the population in order to achieve an acceptable state of urban environmental safety.

The security aspects of urban planning and design can be viewed in two distinctive ways: the first, called 'an architecture of dis-assurance', defines different types of barriers, surveillance cameras and bollards, while this aesthetic design provides easily visible solid safety symbols but can have less effectiveness in stopping the attack (Boddy, 2008: 278). Other 'a passive-aggressive urban design style' e.g. construction of streets made of composite materials that would collapse and prevent the movement of explosive vehicles (Boddy, 2008: 278). This approach involves implementing Crime Prevention Through Environmental Design strategy.

## URBAN PLANNING AND DESIGN IN THE FUNCTION OF SECURITY

Respect for security policy (Sennett, 1970; Ellin, 1996) for adopting rigorous measures to protect public spaces (streets, sidewalks and spaces) from potential threats that can threaten society (eg, violence, terrorism, various types of organized crime,) is negatively reflected in vitality and attractiveness of the urban environment. A number of European cities over the last few years have been designing public spaces in a way that restricts the freedom of movement of people, thereby impairing the functioning and overall quality of life in urban areas. On the other hand, the tendency to reduce human and material losses is one of the main generators of development and improvement of new ways of urban design and planning (Table 1). The 'Action Plan to Support the Protection of Public Spaces' was just designed to integrate security security measures more effectively into the urban environment.

_ Table 1.Security by Design vs Ad-Hoc Security Solutions (Source: European Commision, 2019.), Source: European Commision, 2019.

Security by Design	Ad-Hoc Security Solutions
Efficiency	
The project is **more efficient** as it is designed considering security aspects from its initial design stages. Depending on the project, this may involve modifications in the interior and exterior design, alteration and addition of access points, ensuring structural robustness, introduction of perimeter protection measures, redesign of the surrounding terrain etc.	Ad-hoc solutions are **less efficient** as they, usually, cannot address multiple threats and it is difficult to integrate them in the overall protective design.
Installation	
Security measures are **incorporated in the overall urban design project** and they are less likely to conflict with existing services and utilities (e.g. gas, water, electricity, telecommunication lines). Costly and time consuming diversions are avoided.	Ad-hoc security measures are more likely to **conflict with existing services and utilities** as they are usually stand-alone projects and may lead to costly service diversions, cut off of utilities for residents and slower project implementation

Vulnerability	
Various potential attack scenarios are assessed taking in consideration not only the project's particular features but also its positioning within the overall urban context (e.g. proximity to other crowded places, creation of bottlenecks, shifting of the flow of people). The creation of additional vulnerabilities is **prevented** as such effects are addressed in the planning.	The adoption of ad-hoc solutions may create **additional vulnerabilities or shift vulnerabilities to other public spaces** as the installed measures are usually not examined in a holistic manner.
Cost	
The adoption of security measures as part of an overall urban design project can reduce the costs of protective solutions substantially as planning the protective measure is advance allows for resourcefulness, multifunctionality and **cost-efficiency**	Introducing ad-hoc security measures into an already built environment is generally more **costly**, as there are fewer available options that conform to the needs of the proprietors.
Aesthetics	
The security by design concept guarantees that security measures are **harmonically integrated** into the urban environment, as they are part of a protective urban development project.	The integration of ad-hoc solutions into the urban environment is more challenging and may lead to **questionable** results as they frequently do not blend in with the existing design characteristics.

Urban planning and design over the last few years has been gaining a relatively new security dimension. Talen (Talen, 2008) argues that creating a sense of security for people living in urban areas is a fundamental component of any successful urban project. The best example of how urban planners and architects can combine aesthetic and safety requirements with minimal change in the character of the urban environment is the humble bollard. The circular poles (figures 1) have the function of directing / preventing traffic to provide major pedestrian areas.
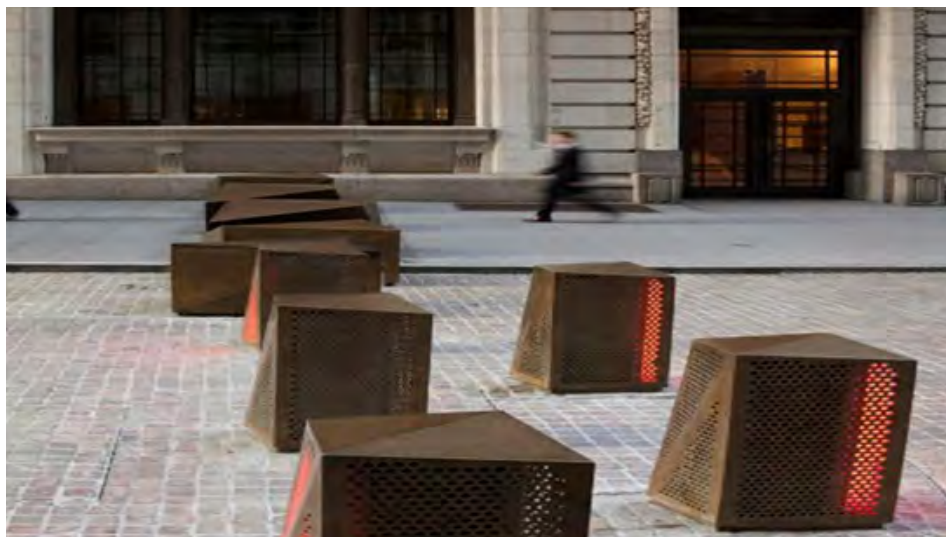
_ Figure 1. Anti-Ram vehicle barrier (bollards) (Source: Quartz, 2016).

Following the 2016 terrorist attack in Nice, urban planners in France are implementing a project to build bollards in all traffic areas (figures 2). It is tempting to emphasize that the United States Department of Defense issues a special list for designing these types of physical barriers (See more at: https://www.usace.army.mil/Portals/2/docs/Protection/DOD_Anti-Ram_Vehicle_Barriers_January_20141.pdf). By accepting this as a standard, urban planners and architects in many western cities adapt their projects to meet the requirements of urban security.

_ Figure 2. Anti-terror barriers in Nice (Source: The Irish Sun, 2017)

Apart from the aforementioned counter-terrorism measures, a special influence on the contemporary design of the urban environment are the demands for crime reduction and the fear of crime. It is precisely the insistence on the consistent application of the Crime Prevention Through Environmental Design (CPTED)[1] principle that has inspired European political officials, architects, urban planners and local community representatives to introduce a specific European (Western) CPTED standard. Paul van Soomeren states that the text of this standard must be used in a concrete situation e.g. a new building plan for the outskirts of Paris, a plan for the renovation of an old harbor site in Amsterdam, or the planning of a shopping area in London (2002: 180).The same author adds that the European CPTED standard focuses on two areas: the first, urban areas and the second urban planning scale; this includes small developments but in most cases refers to larger areas, for example parks, estates and entire neighborhoods.Thus, it can be said that the essence of the CPTED concept relates to how Crowe (Crowe, 2000: 46) states that "proper design and effective use of the built environment can lead to a reduction in the fear and incidence of crime, and an improvement in the quality of life".

EU Member States (eg United Kingdom, the Netherlands and Germany) implement the basic postulates of CPTED in various ways in accordance with their internal urban development planning and crime prevention policies (Town et al., 2003). In 2003, the European Committee for Standardization published the European Pre-Standard for the Reduction of Crime and the Fear of Crime by Urban Planning and Building Design, (CEN, 2003). The two key components on which the European Pre-Standard on Urban Planning and Crime Prevention is based are the following:

> 1. Urban planning can have an impact both on different types of crime and on the fear of crime by influencing the conduct, attitudes, choices and feelings of the key players in these processes, such as offenders, victims, residents and police.
> 2. There are specific types of crimes with environmental dimensions which can be seen as being amenable to urban planning activities, such as burglary and vandalism (CEN, 2003; Kitchen & Schneider, 2007).

In practical terms, the implementation of the CPTED standard involves the use (through urban planning and design) of all available architectural landscape elements to reduce a society's vulnerability

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1 Tim Crowe defines CPTED „The proper design and effective use of the built environment, that can lead to a reduction in the fear and incidence of crime and an improvement in the quality of life. …The goal of CPTED is to reduce opportunities for crime that may be inherent in the design of structures or in the design of neighborhoods" (2000: 46).

to potential security threats. For example buildings with buffer zone layers are much less appealing targets than those without them (Figure 3) (Atlas, 2013: 178). Feldman argues that besides designing the environment, other low-cost precautions such as e.g. locking manholes on the street protects utilities then securing (with locks and alarms) the area where electrical, ventilation and telecommunications stations are located inside or outside residential buildings (Feldman, 2005). In addition, urban planning and designing of parks, busy streets, promenades, sidewalks, public lighting, traffic retarding devices greatly contribute to preventing direct access to potential carriers (terrorists, criminals).

In recent years, some authors (Hodson & Marvin, 2009; Томич & Кесич, 2020) view urban planning and design as a strategic response to urban-environmental security. Namely, the increased economic activities of the population (within urban spaces in the first place) affect the disturbance of the climate balance. As a result of unsustainable exploitation of natural resources, by-products appear (eg greenhouse gas emissions from cars, ash, etc.) which cause incalculable damage by further transformation (occurrence of extreme physical phenomena such as floods, storms, hurricanes, droughts). Cities, are positioning themselves as chief amongst the 'victims' of climate change through, for example, the susceptibility of many coastal and river-side cities to flooding and the health consequences of the urban heat island effect (Hodson & Marvin, 2009). In order to avoid this type of damage, city leaders are adopting measures by which an urban ecological space is planned and designed in an acceptable (balanced) way with continuous economic development. European cities such as Malmö (Sweden), London, Hamburg, Copenhagen and Zaragoza (Spain) best illustrate the state of urban environmental security in the context of sustainable use and efficient urban space design (Shirley-Smith et al., 2008; Gawlik et al., 2017; European Commission, 2020).
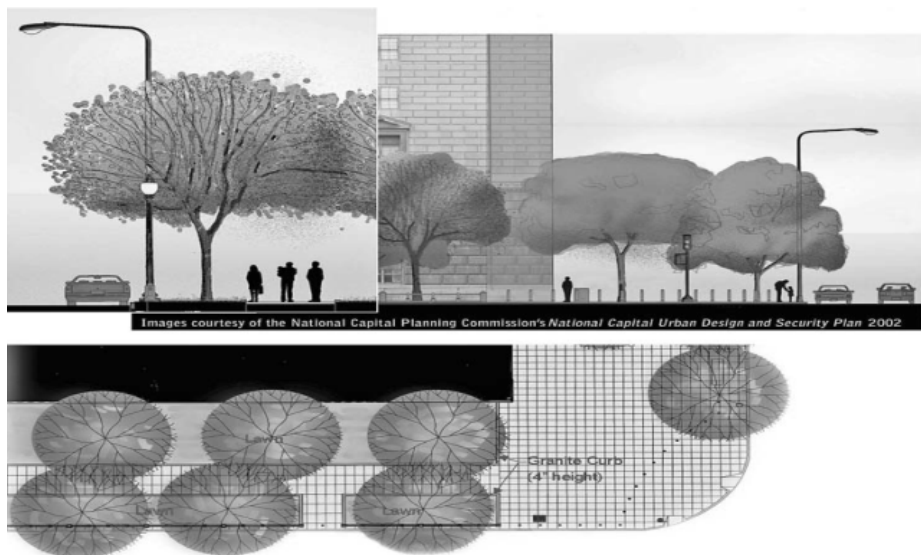
_ Figure 3. Protecting Buildings and Infrastucture with CPTED (Source: Atlas, 2013:179).

It should be noted that urban planners and architects should not impair the undisturbed functioning of society or the entire aesthetic image of the urban environment by applying these security standards. Therefore, the purpose of architectural security design (Atlas, 2013) is first and foremost preventive, ie adequate design of public space significantly impedes targeted attacks (terrorist or criminal) and thus minimizes security risks. Consequently, urban planners and architects can be viewed as a kind of urban security provider.

VULNERABILITY IDENTIFICATION TOOLS FOR RESILIENCE ENHANCEMENTS OF URBAN ENVIRONMENTS, VITRUV

Vulnerability Identification Tools for Resilience Enhancements of Urban Environements (VITRUV) funded by the European Commision under its F17 Research and Techincal Developmet Progranmme is carried out by a constrium of 12 industry partnersm public and research institutions drawn from European countries (Fischer, 2012).

This project is special software program used by planners to identify and analyze security risks and their damages, and offer the right solutions.

Planners who use VITRUV's tools will be able to deliver urban space less prone to and less affected by attacks and disasters, thus sustainably improving the security of citizens.

The main objective of VITRUV is the development of software tools for the long and complex screening process, which is urban planning, moving across three levels from concept to plan to detail design. The tools will enable planners:

- *Concept level* is important to make well-considered systematic qualitative decision
- *Plan level* is important for analysing the susceptibility of urban spaces, and
- *Detail level* for performing vulnerability analyses of urban spaces by computing the likely damage on individuals, buildings, traffic infrastructure (See more on this link: https://cordis.europa.eu/project/id/261741)

VITRUV is based on multiple event data, within a risk approach, quantities are derived that measure averaged susceptibilities, vulnerabilities and risks for buildings and infrastructure in the context of urban planning. The importance of empirical approach allows for local scaling factors for frequency of events, e.g., due to physical accessibility, and for consequences, e.g., due to physical counter-measures (Vogelbacher et al., 2016).

Republic of Serbia as a potential candidate for EU membership must organize urban space and have to accept and implement this project at the lowest level. The best solution is cooperation of all social and political actors in realization and implementation of this project. An important step towards improving the safety of citizens by minimizing potential risks and threats within the urban space, was made with the adoption of the Law on Critical Infrastructure in 2018. However, the lack of institutional capacities of the Republic of Serbia in terms of continuous implementation of the mentioned measures is the main obstacle to achieving acceptable European standards of urban security.

CONCLUSION

The urban environment in modern conditions requires a series of security, technical and organizational safeguards to protect human well-being. The need to implement effective urban planning and design (part of the measures mentioned) is particularly highlighted by examples from European Union Member States. Namely, in the last few years, European Union operational and expert bodies have been developing specific standards and procedures by which existing (as well as future) urban infrastructure is redecorated (planned and designed) in accordance with urban security requirements. Often the literature cites the example of 'Action Plan to Support the Protection of Public Spaces' as a coded way of integrating security measures more effectively into the urban environment through planning and design. Some authors point to the close connection between design and urban environmental safety as a fundamental prerequisite for sustainable population development in modern conditions. The vulnerability of the urban population due to the emergence of various types of extreme natural phenomena (ie natural disasters caused by climate change) is partially mitigated by the adoption of preventive measures, including modern urban and architectural standards of design and construction (such as European cities London, Hamburg, Copenhagen).

The specificity of the European urban planning and design model is also reflected in the design of specific software for the identification and analysis of risks and their damage within urban space.

Vulnerability Identification Tools for Resilience Enhancements of Urban Environments allows urban planners to analyze in depth the security risks and vulnerabilities of urban infrastructure. In addition, the close cooperation and strategic partnership of urban planners and architects with representatives of local, city and national levels of government further enhances the construction of a safer living environment. Therefore, preventive action is the essence of urban planning and design, especially due to the fact that the intensity of potential damage to human health and their environment is significantly reduced.

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