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## ARTICLE

# Anti-Crisis Urban Design and Hotel Infrastructure: A New Paradigm of Post-War Urban Development

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## ABSTRACT

This study investigates models for restoring hotel infrastructure within a comprehensive framework of crisis-responsive urban design during and after military aggression, using Ukraine as a focal case. By integrating restorative construction, inclusive urban design principles, and community participation, resilient cities aim to create environments that accommodate individuals with diverse mobility levels and needs. In the context of reconstructing Ukrainian cities, hotel infrastructure emerges not only as an economic asset but also as a critical component of an anti-crisis urban system capable of supporting social stability, mobility, and the economic revitalization of affected territories. The article advances a conceptual framework for crisis-oriented urban design that positions hotels as catalysts of spatial and social regeneration within the urban fabric. Drawing on theories of urban design, crisis management, and urban infrastructure, as well as international examples of post-disaster urban rehabilitation, the study demonstrates how innovative planning paradigms can facilitate the transformation of devastated or degraded urban areas. Particular attention is devoted to the role of hotel facilities in establishing temporary hubs for internally displaced persons, entrepreneurial activity, and educational and cultural initiatives that strengthen social interaction and local resilience. The paper further examines the challenges of post-war reconstruction through the lenses of urban policy, economic feasibility, and sustainable development principles. The findings indicate that crisis-responsive urban design incorporating hotel infrastructure

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constitutes a new paradigm for post-war urban development—one capable of enhancing flexibility, viability, and social cohesion in contemporary Ukrainian cities.

**Keywords:** Urban Resilience; Post-War Recovery; Inclusive Urban Design; Safe Hotel Infrastructure; Sustainable Development

## 1. Introduction

Contemporary urban development planning predominantly unfolds within established urban landscapes. Due to the continuous concentration of population in cities, where employment opportunities, educational institutions, and essential services are more accessible, the demand for new construction is steadily increasing. Under these conditions, the primary objective of urban development is to ensure alignment with local architectural traditions, geo-spatial characteristics, and locational specificities. The fundamental principles guiding this process include the structural reliability of buildings, the convenience and safety of living conditions, and the harmonious integration of new developments into the surrounding environment.

At the same time, technological and climate-related disasters, terrorist attacks, and military hostilities lead to the destruction of urban areas and local infrastructure. Consequently, the reconstruction of cities and settlements is carried out according to updated principles that encompass enhanced requirements for structural strength and reliability, the provision of shelters, and, when necessary, the creation of mobile settlements to accommodate populations affected by natural or anthropogenic crises. In this context, Ukraine serves as a critical case study, as its urban fabric has been severely damaged since 2014. The research focuses on several key aspects: (1) the reconstruction of damaged buildings, structures, and local infrastructure; (2) the development of mobile settlements for internally displaced persons and individuals who have lost their homes due to shelling; (3) post-war reconstruction of formerly occupied territories and areas devastated by active hostilities; and (4) the creation of barrier-free spaces and inclusive environments. Given that hotel facilities can provide temporary accommodation, logistical support, and the continuity of urban services, they constitute a form of critical infrastructure. This positions hotels as a central (5) component

in the design of crisis-responsive urban systems.

To address these focal points, the study aims to formulate a concept of crisis-oriented urban design that integrates hotels into the post-crisis urban environment as catalysts for spatial and social regeneration. It is important to emphasize that during crises, hotels often prioritize their social function by providing shelter to individuals affected by emergencies. Globally, there exists substantial experience in urban restructuring within the contexts of wartime (Israel, Syria, Palestine, Iraq, Afghanistan) and post-war (Bosnia and Herzegovina, Croatia, Kosovo, Rwanda, Lebanon) recovery. Ukraine, in turn, has developed its own practices of hotel-based support during prolonged shelling and the destruction of energy infrastructure. In many countries, hotels are officially classified as critical urban facilities during emergencies, underscoring the relevance of this research.

The vast majority of scientific approaches presented in the academic field on the sustainability and post-crisis development of cities consider hotels mainly as commercial objects of the urban economy. Taking into account the experience of Ukrainian hotels, which, in conditions of damage to urban development perform the functions of temporary accommodation of affected residents, support of humanitarian flows and stabilization of urban systems, the study reinterprets their role in urban space. The novelty of the work lies in the conceptualization of hotels as elements of critically important urban infrastructure, capable of supporting urban communities and contributing to the adaptation and restoration of urban systems in crisis and post-crisis conditions.

This article contributes to the evolving discourse in urban studies and hotel infrastructure by proposing an interdisciplinary model of urban regeneration that positions human safety and comfort as both a moral and strategic imperative and a foundational element of long-term resilience and social stability within urban environments.

## 2. Materials and Methods

### 2.1. Methodology and Research Design

This study has an exploratory design and is based on a qualitatively oriented approach at the intersection of urban design, crisis management, and infrastructure policy.

The aim of the study was to conceptually substantiate the role of hotel infrastructure in post-crisis urban systems and its potential integration into the list of critically important urban facilities.

The study is aimed at the formation and theoretical substantiation of the research hypothesis:

**H1.** *In post-crisis urban systems, hotels integrated into the structure of critical urban infrastructure can play a supporting role in the processes of adaptation and recovery after military operations, natural and man-made disasters and other large-scale shocks.*

Given the exploratory nature of the study, the hypothesis serves as an analytical guideline for the interpretation of empirically informed observations and conceptual generalizations.

### 2.2. Data Collection Methods

The data sources in the study are divided into two main groups: secondary documentary sources and qualitative expert data.

Secondary sources include academic scientific literature on urban design, urban resilience, crisis management and infrastructure research; strategic and program documents at the national and international levels; reports and analytical materials of international organizations (UN-Habitat, United Nations Office for Disaster Risk Reduction (UNDRR), World Health Organization (WHO)); open statistical data on the hotel infrastructure of Ukraine; as well as published international and Ukrainian cases of post-crisis and post-war urban regeneration.

Qualitative empirical data were obtained through semi-structured expert interviews. The selection of experts was carried out according to the principle of purposive sampling, taking into account their professional experience in the fields of urban design, architecture, hotel infrastructure management, urban planning and public administra-

tion in the context of urban regeneration in Ukraine. The interviews were conducted according to a pre-prepared guide covering thematic blocks related to the functional transformation of hotels in crisis conditions, their integration into urban systems, interaction with humanitarian and mobility flows, as well as practical limitations of implementing the relevant models. The interview format allowed for clarification and expansion of responses depending on the professional context of the respondents.

### 2.3. Analytical Methods and Data Analysis

The analytical part of the study is structured as a sequential multi-step qualitative analysis procedure, consistent with the exploratory design and conceptually oriented nature of the work.

At the first stage, horizon scanning was applied to systematically identify international and historical practices of post-crisis urban recovery, long-term trends and typical regeneration models.

The second stage involved a qualitative comparative case analysis aimed at comparing international recovery models with the Ukrainian context, in particular taking into account frontier zones, urban flows and critical infrastructure systems.

At the third stage, a qualitative thematic analysis of semi-structured expert interviews was carried out, which included open analytical codification, grouping of codes into thematic categories and identification of recurring semantic patterns.

The fourth stage covered the analytical synthesis of the results of horizon scanning, case analysis and expert interviews in order to form a conceptual model of the integration of hotel infrastructure into post-crisis urban systems.

### 2.4. Ensuring Validity and Ethical Framework

The study clearly distinguishes between empirically informed conclusions and theoretical arguments. Empirical findings, obtained through case studies and expert interviews, serve an explanatory and illustrative function and are used to support conceptual propositions. Theoretical generalizations were formed separately through critical analysis of the concepts of Urban Resilience, Urban An-

chors and Social Capital.

The validity of the results was ensured through triangulation of sources (documentary analysis, international cases, expert interviews) and theoretical triangulation between complementary conceptual approaches.

The ethical framework of the study provided for voluntary participation of experts, obtaining informed consent, ensuring confidentiality and anonymization of interview materials. Given the security and post-crisis context, personal and location-sensitive data were not recorded.

### 3. Results

The growing environmental crisis shapes the methodological contours of planning and organizing urban space. The increase in the frequency and intensity of natural, man-made, and military disasters transforms the traditional logic of urban development, bringing to the forefront the issues of the sustainability of urban systems and the city’s ability to quickly adapt and recover. Under such circumstances, service infrastructure objects with a high level of functional flexibility become particularly important. In this context, hotels go beyond the traditional logic of hospitality. They are considered potential elements of critical urban infrastructure, capable of performing security, social, and stabilization functions in crisis conditions. This determined the logic of presenting the study’s results, including

an analysis of international experience in anti-crisis urban design, identification of Ukrainian insights into the functioning of cities in war conditions, and modeling the development of hotels as safe and socially oriented spaces in the modern urban landscape.

#### 3.1. Studying the World Experience of Post-War Urban Reconstruction

The initial stage of presenting the results is the analysis of international experience in urban design in post-war and post-disaster urban regeneration, which allows identifying applied mechanisms to increase the adaptability of urban systems and provides a basis for further testing of the research hypothesis.

First of all, it is worth noting that military (post-war) urban regeneration is a complex process of spatial, socio-economic, institutional, and cultural restoration of urban areas after large-scale destruction caused by war [1]. In addition to the physical and material restoration of urban infrastructure and architecture, regeneration may also include other areas. In this multi-level system, physical restoration creates a basis for managerial coordination, social restoration, and economic growth, and value-identification transformation sets the long-term vector of city development (Figure 1).

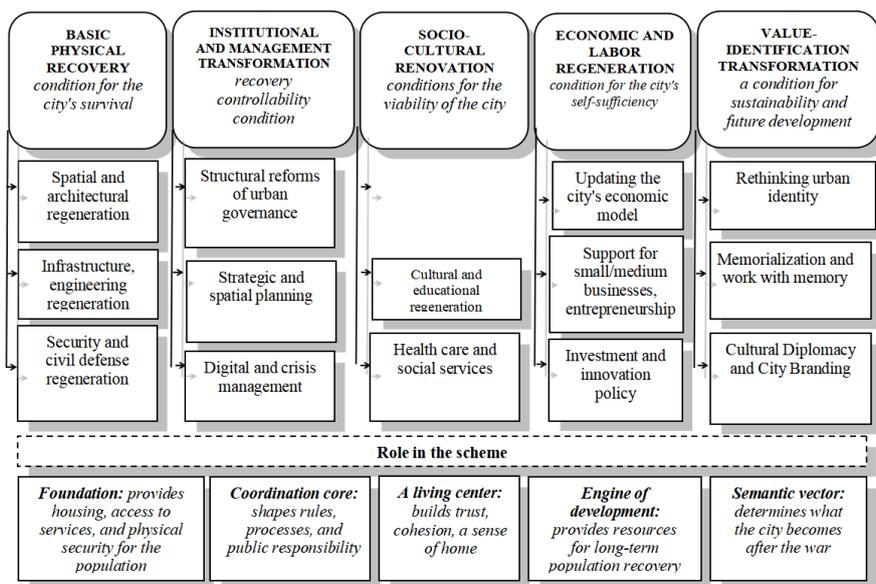


Figure 1. Multi-level structure of war (post-war) urban regeneration.

Source: Developed by the authors based on Setola [1,2].

Content analysis of **Figure 1** shows that war and post-war urban regeneration appear as a multidimensional process of systemic adaptation of the urban organism. It encompasses fundamental, institutional, managerial, socio-cultural, economic, and labor, as well as value and identity transformations. The goal of this process is not only the basic (physical) restoration of the destroyed environment, but also the restoration of the city’s viability as an integral post-crisis system capable of functioning under prolonged risks, uncertainty, and

repeated shocks.

Thus, the multi-level structure of regeneration aims to restore the urban environment, taking into account new security, social, and environmental compliance, which is implemented through the reconstruction of residential and public buildings, the revitalization of destroyed territories, and the adaptive reuse of objects. Rethinking these aspects aims to form a new image of the city, in which the war experience is integrated into the city’s cultural, symbolic, and social spaces (**Table 1**).

**Table 1.** Rethinking urban identity as a philosophy of war (post-war) regeneration of the urban environment.

Dimension	Rethinking Content	Key Tools and Mechanisms
Historical and architectural	Understanding the city’s war experience; forming collective memory without traumatization; preserving historical identity	Memorial spaces; routes of memory; preservation of authentic fragments of destruction; museums, archives, historical narratives
Spatial-architectural	Formation of a renewed image of the urban environment; combination of reconstruction and modern architecture	Revitalization of public spaces; new symbolic dominants; principles of sustainable and safe design
Social and community-oriented	Restoration of social ties; integration of diverse population groups; fostering a sense of belonging	Participatory planning; community-led programs; social programs; local community centers
Valuable	Moving from identification as “victim” to national identity and development; affirming dignity and solidarity	Formation of urban values; educational and cultural programs; public discussions
Economical and functional	Rethinking the economic role of the city; supporting the local economy	Development of small and medium-sized businesses, creative industries; new urban specializations; employment clusters, etc.
Communication-symbolic	Formation of a new urban image and external image of the city	Urban branding; cultural events; artistic interventions; media communications
Institutional and managerial	Restoring trust in city government; engaging the community in governance	Transparent management procedures; public councils; international partnerships

Source: Developed by the authors based on references [1–5].

Let us consider the aspects presented in **Figure 1** and **Table 1** through the prism of the key hypothesis of the study. The presented multi-level regeneration model allows us to interpret urban regeneration as a complex process within which the hotel infrastructure is integrated as an object of critical infrastructure. That is, hotels can perform a supporting function at different stages of crisis and post-crisis transformations, in particular by providing temporary accommodation and stabilizing urban services. First of all, this concerns Ukrainian cities located in zones with a high degree of military threats: Kyiv, Kharkiv, Chernihiv, Odesa, Dnipro and Sumy. They are constantly experiencing varying degrees of destruction, changes in population movement vectors and functional reconfiguration of ur-

ban infrastructure. They also illustrate the different roles of hotels in crisis and post-crisis conditions, ranging from providing emergency accommodation and humanitarian support.

Traditionally, research on critical infrastructure focuses on energy systems, transportation, water supply, healthcare, and communications. However, recent scholarly work on urban resilience and crisis management increasingly highlights the importance of flexible and adaptive infrastructural elements capable of performing atypical functions under extreme conditions [6–10]. Hotels can be considered part of this category, as they demonstrate high adaptability and the capacity to assume functions characteristic of critical infrastructure.

At a basic operational level, hotels function as service nodes capable of providing temporary accommodation, shelter, autonomous operation during blackouts, and logistical support for the population and key stakeholders. At a broader semiotic level, hotel infrastructure may also be interpreted as an element of the city’s symbolic and social transformation – a space of social interaction, international communication between tourists and residents, and economic reintegration. Thus, hotel infrastructure is not merely a component of the local tourism economy but a multifunctional spatial resource capable of integrating into systems of urban shelters, crisis hubs, temporary accommodation centers, and facilities supporting the restoration of essential urban services. This perspective expands the analytical boundaries of hotel-related research and establishes a foundation for further modeling of their development as safe and socially oriented elements of the urban landscape.

At the same time, structural reforms in urban governance constitute an essential component of wartime and post-war urban recovery policy. Such reforms must include modernizing institutional systems to ensure effective coordination of reconstruction efforts involving urban facilities and public spaces. Key conditions for effectiveness include reducing decision-making time and overcoming bureaucratic inertia. These goals can be achieved through decentralizing administrative authority, establishing localized recovery nodes, supporting volunteer initiatives, and implementing digital governance tools (**Table 2**).

The results presented in **Table 2** indicate that in the post-crisis development context, hotel infrastructure can perform an institutional and coordination function within urban systems, going beyond the limits of purely market logic. This creates a basis for analyzing the economic and systemic effects of integrating hotels into urban renewal processes, summarized in **Table 3**.

**Table 2.** Key areas of structural reforms of governance during the military (post-war) regeneration of local self-government.

Direction	Rethinking Content	Key Tools and Mechanisms
Institutional	Restructuring the urban governance system in line with new challenges; strengthening the capacity of local authorities	Reorganization of management bodies; creation of recovery agencies; clear division of powers
Strategic planning	Transition from reactive to strategic management of urban development	Post-war development strategies; integrated recovery plans; scenario planning
Decentralized	Delegating powers and resources to the local level; increasing the role of communities	Financial decentralization; community empowerment; local recovery budgets
Participatory	Institutionalization of community participation in management decision-making	Public hearings; participatory budgets; advisory boards; digital participation platforms
Financial and economic	Ensuring transparent and effective recovery financing	International assistance mechanisms; public-private partnerships; recovery funds
Interlevel (multiscalar)	Coordination of actions between local, national and international levels	Coordination headquarters; intergovernmental agreements; donor platforms
Digital management	Modernizing management through digital tools	E-governance; GIS platforms; open data; digital registries
Anti-corruption and control	Ensuring accountability and trust in recovery processes	Transparent procurement; audit; public oversight; international monitoring
Personnel and organizational	Formation of a new management culture and competencies	Training of personnel; involvement of experts; restoration project offices

Source: Developed by the authors based on references [2-6].

**Table 3.** Updating the city’s economic model during military (post-war) city regeneration, taking into account hotels as key drivers of urban sustainability.

Dimension	Rethinking Content	Key Tools and Mechanisms
Structural and sectoral	Transition from a collapsed or monofunctional economic structure to a diversified and sustainable one, in which hotels play the role of cross-sector stabilizers of economic activity	Diversification of sectors; development of the service economy; integration of hotels as hubs of business, service and logistics activity
Locally entrepreneurial	Restoration of small and medium-sized businesses through the formation of local entrepreneurial ecosystems around hotels	Grants for SMEs; tax incentives; business incubators; partner networks of hospitality suppliers and services
Innovative and creative	Shaping the knowledge economy and creative industries using hotels as platforms for interaction, events and startup activity	Creative clusters; hotel-based hubs; startup programs; partnerships with universities and educational centers
Market and investment	Attracting domestic and foreign investment through projects that combine economic feasibility and restorative effect	Investment platforms; public-private partnerships; hotel recovery projects as investment „anchors“; mixed-use complexes
Socio-economic	Combining economic growth with social cohesion and restoring human potential	Social entrepreneurship; employment programs; involvement of hotels in employment of IDPs, veterans, youth
Spatial-economic	Economic revitalization of destroyed and depressed areas through the integration of the hotel function into the urban grid	Revitalization of industrial zones; brownfield development; hotels as elements of mixed-use projects and points of spatial regeneration
Green-economic	Transition to an environmentally responsible and energy-efficient model of the urban economy	Renewable energy; green infrastructure; energy-efficient and autonomous hotels as demonstration sites for sustainable development
Human capital	Restoration and development of the city’s labor potential in the face of demographic and migration challenges	Educational programs; retraining; hotels as platforms for first employment and professional adaptation
Long-distance and global	Integration of the city into national and international economic networks	Intercity partnerships; export programs; hotels as interfaces for international communication, mobility and cooperation

Source: Developed by the authors [1-5,7-11].

It should be noted that ecological and climatic regeneration aims to mitigate the consequences of destructive disasters and to build a sustainable environment. In particular, this concerns the demilitarization of mined territories and territories after hostilities. For Ukraine, this also includes overcoming the consequences of the explosion of the Kakhovka hydroelectric power station in 2023, which destroyed settlements and caused eco-cide in the Kherson and Odesa regions of Ukraine due to large-scale flooding [12]. Therefore, land reclamation, restoration of green/water areas, and management of war waste focus on environmental safety and protection of public health [5]. Updating the city’s economic model restores economic activity among businesses and the population. In the context of large-scale destruction and the basic physiological needs of people, hotels should

be considered an integrated part of critically important urban infrastructure. After all, they create “points of invincibility”, providing temporary housing, landing spaces for offices, etc. And thus they play a role as drivers of economic activity, social stabilization, and the long-term sustainability of post-crisis urban systems. At the same time, social integration and psychological recovery of communities become possible through the restoration of social ties and social capital, overcoming the collective trauma of the population, and the formation of an inclusive urban environment capable of supporting long-term social cohesion. In this aspect, it is necessary to develop institutions of psychosocial support for the population, the integration of IDPs and veterans, and community development to create a sense of trust and security. And hotels in this sense also occupy their niche (Table 4).

**Table 4.** Social integration and psychological recovery of communities during war (post-war) regeneration of society.

Regeneration Component	Rethinking Content	Key Tools and Mechanisms	The Role of Hotels in the City's Critical Infrastructure
Psychological	Overcoming individual and collective trauma; restoring a sense of security	Psychosocial support; crisis counseling; support groups; trauma-informed practices	The hotel as a safe space of stabilization: temporary accommodation, retreat programs, partnerships with psychologists, spaces of silence and recovery
Social integration	Integration of different population groups (IDPs, veterans, local residents)	Social adaptation programs; mediation; inclusive urban policies	The hotel as a neutral platform for interaction: joint events, adaptation programs, employment of IDPs and veterans
Community	Restoring social capital and horizontal connections	Community centers; public spaces; local initiatives; volunteer networks	Hotel as a community hub: open spaces for meetings, volunteer headquarters, local initiatives
Cultural and identification	Building a shared identity and sense of belonging	Cultural events; art projects; local traditions; symbolic practices	Hotel as a carrier of local identity: cultural events, local design, gastronomy, narrative of place
Spatial-therapeutic	Using urban space as a healing environment	Green areas; quiet spaces; memorial landscapes; safe public spaces	Hotel as a therapeutic space: landscape solutions, wellness zones, integration with the natural and urban environment
Educational and communicative	Restoring dialogue and nonviolent communication skills	Educational programs; public discussions; media literacy	Hotel as a platform for learning and dialogue: trainings, conferences, educational residencies
Socio-economic	Return to active social life through work and employment	Employment programs; social entrepreneurship; support for vulnerable groups	Hotel as a driver of the local economy: jobs, support for SMEs, local supply chains
Institutional support	Formation of a sustainable system of social and psychological support	City support services; partnership with NGOs; international humanitarian programs	Hotel as an institutional partner: cooperation with the municipality, NGOs, international donors

Source: Developed by the authors.

Based on the findings summarized in **Table 4**, it can be concluded that within the framework of wartime and post-war urban regeneration, the hotel is no longer viewed solely as an element of tourism or market infrastructure. Its functional role undergoes a substantial transformation—from a service-oriented facility to an active spatial-institutional agent of recovery, integrated into a multilayered system of social, economic, and security resilience within the local community. Consequently, the traditional model of the hotel as a passive consumer of urban resources gives way to a conceptualization in which the hotel becomes a nodal point at the intersection of public and private interests, a space for the accumulation of social capital, and a platform for implementing recovery policies.

Due to their spatial autonomy, organizational structure, and capacity for rapid adaptation, hotels can serve as temporary centers of safety, social integration, psychological stabilization, and economic activation. Within this logic, the hotel emerges as a hybrid infrastructure that combines market mechanisms with elements of social and

humanitarian mission. It is capable not only of responding to crisis challenges but also of proactively enhancing the city's adaptive capacity by functioning as a space for dialogue, learning, cultural identification, and support for vulnerable population groups. This perspective positions hotels as institutionally embedded components of urban regeneration, incorporated into systems of spatial planning, crisis management, and long-term development strategies.

Thus, the transformation of the hotel's role from a passive infrastructural unit to an active recovery hub reflects a broader paradigm shift in post-crisis development—from the restoration of physical objects to the restoration of functions, interactions, and trust within urban and territorial systems.

It should be emphasized that security-oriented and civil-defense regeneration, particularly during wartime, must ensure the integration of safety considerations into urban planning. This requires the development of civil protection systems, the creation of safe public spaces, and the implementation of crisis-planning instruments. The prima-

ry objective is to build resilience to threats and protect the population. This complements the functional role of hotels within urban critical infrastructure, especially given that many hotels are equipped with shelters.

Let us now turn to practical insights from international experiences of urban recovery following disasters and military aggression. Unfortunately, global practice of-

fers numerous examples of urban regeneration after technological, military, and natural catastrophes. Accordingly, we interpret relevant cases using the horizon scanning method (**Table 5**), which enables the identification of long-term trends, scenarios, and innovative approaches in the spatial, infrastructural, and socio-economic regeneration of territories.

**Table 5.** Horizon scanning of urban renewal models and the potential for hotel integration.

Regeneration Type	Country/City	Key Model/Recovery Pattern	Key Lessons for Ukraine	The Potential Role of Hotels in Regeneration
Military regeneration	Israel	Shelter urbanism, multi-level protective infrastructure, integration of security into development	Combining reconstruction with safety design; architecture as a survival tool	Hybrid hotels with shelters, crisis hubs for volunteers, medics, international missions
	Syria (Aleppo, Homs)	Large-scale reconstruction of destroyed historical centers	The need to balance authenticity and functionality	Restoration of historic hotels as symbols of urban identity
	Palestine	Designing resilient communities in a chronic conflict zone	Spatial compactness, multifunctionality	Small hotels as service and social hubs
	Iraq and Afghanistan	Restoring basic urban systems after prolonged fighting	Priority of functional minimum viability of the city	Temporary and modular accommodation formats
Post-war regeneration	Bosnia and Herzegovina (Sarajevo)	Post-war spatial healing, restoration of public spaces	Space as a tool for social reconciliation	Hotels as cultural and event platforms
	Croatia	Tourism as a driver of economic recovery	Rebuilding through attracting international tourists	Resort and city hotels as economic anchors
	Kosovo	Infrastructure reconstruction and international assistance	The importance of donor programs	Hotels for international organizations and businesses
	Rwanda	Social and spatial regeneration after genocide	Integration of memory and development	Hotels as tools of memorial tourism
	Lebanon (Beirut)	Private investment model of reconstruction	Risks of commercializing space	Luxury hotels as symbols of global integration
Post-disaster regeneration	Japan	Sustainable, technologically advanced redevelopment construction	Planning for future risks	Smart hotels as elements of safe infrastructure
	Chile	Rapid social housing after the earthquake	Rapid social housing after the earthquake	Temporary hotel solutions
	USA	Comprehensive urban regeneration after disasters	Multifactor management	Hotels as centers of urban revitalization
	Turkey	Large-scale state reconstruction programs	Centralized recovery management	Massive renovation of hotel infrastructure

Source: Developed by the authors based on references [10, 13–16].

In the process of scanning international experiences of urban recovery, the cases were grouped by the type of destructive impact and the nature of the recovery process. This approach enabled identification not only of successful reconstruction practices but also of potential points for integrating hotel infrastructure into the spatial and functional regeneration of cities. Analysis of the content and characteristics of urban regeneration, based on the data presented in **Table 5**, enabled the identification of three groups of models with the highest potential for adaptation in Ukraine:

1. Security-integrated models (Israel, partially Japan), in which architecture and service infrastructure are designed with constant risk factors in mind.
2. Post-war tourism-oriented models (Croatia, Bosnia and Herzegovina), where hotel infrastructure catalyzes economic activity and spatial renewal.
3. Post-disaster rapid-response models (Japan, Chile) demonstrate effective mechanisms for scaling and standardizing reconstruction solutions.

From this perspective, hotels within the Ukrainian model of post-war regeneration should be conceptualized

as hybrid spatial entities capable of performing economic, social, security, and communicative functions within the structure of the recovering city.

Overall, the analysis of international post-war urban regeneration demonstrates that the most resilient outcomes are achieved when recovery encompasses not only physical reconstruction and economic growth but also cultural, governance-related, and social dimensions. Accordingly, several typical regeneration strategies can be distinguished, each based on a specific set of instruments and offering essential lessons for Ukraine<sup>[3-5,17-20]</sup>:

1. Cultural-identity regeneration (Germany, Japan, Bosnia and Herzegovina) involves using historical memory and cultural heritage as a foundation for shaping a new urban identity. Urban recovery is understood not merely as physical reconstruction but as an ethical and symbolic process aimed at reconciling with the past and creating a value-based vision for the future. Implementation tools include the rebuilding of iconic historical sites and public spaces, the creation of memorial landscapes and spaces of remembrance, the integration of memory culture into urban planning, and active citizen engagement in discussions on recovery formats.
2. Institutional-governance transformation (Israel, Germany, Rwanda) focuses on the profound restructuring of urban governance systems. Its primary goal is to enhance crisis preparedness and ensure effective strategic planning through the establishment of specialized recovery agencies or offices, decentralization and strengthening of municipal authority, digitalization of administrative processes, and increased transparency in decision-making. Governance is conceptualized here as a key infrastructure of recovery.
3. Economic (reconstruction-investment) strategy (Kuwait, Lebanon, partially Iraq) aims to stimulate the urban economy through infrastructure projects and business incentives. Economic revitalization becomes the primary driver of stabilization through large-scale public or private investment programs, public-private partnerships, and the restoration of key sectors such as energy, commerce, and services.
4. Social integration and psychosocial strategy (Rwanda, Bosnia and Herzegovina, Israel) is oriented toward rebuilding social capital, overcoming collective

trauma, and fostering new forms of community solidarity. Social recovery is viewed as a prerequisite for sustainable spatial and economic development. It is implemented through psychological and psychosocial support programs, the creation of community centers and dialogue spaces, cultural and educational initiatives, and integration programs for vulnerable population groups.

Thus, international experience in post-war regeneration demonstrates that successful urban recovery is possible only when cultural, governance, economic, and social components are integrated. Each of these strategies offers unique lessons and tools that can be adapted to the Ukrainian context to enhance urban resilience and ensure sustainable development. Each strategy carries its own advantages and implications for the reconstruction and development of cities, towns, and territorial communities. For Ukraine, the key challenge (and simultaneously an opportunity) is the transition from fragmented reconstruction to a holistic model of urban transformation oriented toward resilience, inclusiveness, and long-term development.

Within this research direction, the hypothesis was verified through an analysis of international examples of post-crisis urban recovery and a comparison of corresponding urban development strategies. The results of the study indicate that the functional roles of hotels in crisis-affected urban systems extend beyond service-oriented logic, allowing them to be interpreted as elements of critical urban infrastructure.

### **3.2. Ukrainian Insights into Anti-Crisis Urban Design in Wartime**

Urban development processes have historically been shaped by natural, climatic and anthropogenic factors, among which military conflicts played a key role in the transformation of urban development, infrastructure and logistics systems.

Ukraine, like many European cities, has extensive post-war reconstruction experience. The Second World War (1939–1945) left behind millions of tons of destroyed buildings and infrastructure across European cities<sup>[19]</sup>. The restoration of these cities became a meaningful urban planning process that combined the reconstruction of the historical environment, modernization of planning, social

adaptation, and economic stabilization <sup>[20]</sup>.

In Ukraine, following the de-occupation between 1943 and the 1950s, housing stock and industrial, social, and cultural infrastructure were rebuilt as part of large-scale reconstruction efforts within the former Ukrainian Soviet Socialist Republic (UkrSSR). This period included the restoration of housing, enterprises, educational institutions, and cultural facilities according to a strict plan and within the framework of a centrally controlled, command-administrative economy characteristic of Soviet reconstruction practices. This historical experience is significant because it illustrates several key imperatives:

1. Urban reconstruction in Ukraine has always combined comprehensive infrastructure restoration with the reestablishment of social services.
2. It required centralized planning and coordination under high-risk conditions.
3. It focused not only on rebuilding homes but also on restoring the rhythm of urban life.

Drawing on lessons from historical reconstruction enables the development of a contemporary model of urban regeneration that emphasizes the integration of cultural heritage, inclusivity, environmental sustainability, and the adaptability of urban infrastructure (Table 6). Such a model aligns traditional urban planning principles with the needs of the modern post-war period, creating resilient

and safe spaces for living, working, and social integration within communities.

The imperatives of historical reconstruction, summarized in Table 6, logically correlate with the modern challenges of the transformation of urban systems in Ukraine, where not only the physical restoration of buildings is relevant, but also the reproduction of the socio-economic functions of the city and its cultural identity. A significant part of Ukrainian cities and settlements has suffered critical destruction, which has led to a deep functional reconfiguration of urban systems. In particular, most settlements in the Donetsk region, such as Mariupol, Bakhmut, Avdiivka, Volnovakha, Lyman, Soledar, Maryinka, Severodonetsk, Popasna and Rubizhne, are not subject to restoration. The scale of destruction has become critical, and urban buildings have been virtually destroyed as a result of prolonged artillery and missile attacks and hostilities <sup>[11]</sup>.

Therefore, the analysis of international and Ukrainian experience of post-war reconstruction served as an analytical basis for the formation of a priori vectors of reconstruction of Ukrainian cities, within which hotel infrastructure is considered as a component of spatial, social and functional regeneration of the urban environment. On this basis, a model of military and post-war reconstruction of Ukrainian cities is proposed, reflecting key strategic vectors, frontier zones of responsibility and the role of hotels in urban regeneration policy (Table 7).

**Table 6.** Horizon scanning: Lessons from rebuilding Ukrainian cities.

Components	World War II in Ukraine (1941–1945)	Lessons for the Future (2022–Perspective)	The Role of Critical Infrastructure (Hotels)
Directions of urban reconstruction policy	Centralized planning, priority for housing and industry	Comprehensive recovery: housing, infrastructure, social services	Hotels as platforms for temporary accommodation, logistics and business events
Architectural and infrastructural urban planning features	Restoration of the historical environment, typical Soviet buildings, reconstruction of city centers	Combining historical styles with modern safety standards	Hotels are being renovated, taking into account local architecture, while providing modern services
Inclusive and barrier-free environment	Minimal approaches, limited attention to accessibility	Priority of barrier-free environment, inclusive public spaces	Hotels are being adapted for IDPs, people with disabilities, and volunteers
Ecological urban renewal solutions	Local greening, limited energy-saving technologies	Using energy-efficient solutions, restoring green areas	Hotels integrate environmental practices: energy efficiency, green infrastructure, waste management
Sociocultural and rehabilitation spaces	Restoration of cultural centers, schools, hospitals	Restoring social capital, community centers, spaces for dialogue	Hotels as spaces of social integration: community meetings, cultural events, psychological support
Economic and tourist function	Rebuilding businesses and the local economy	Stimulating the local economy and tourism	Hotels support tourist flows, business events, and attract investment
Technological and digital adaptation	Limited use of technology, paper management	Integration of digital platforms for city management, resources and communications	Hotels as digital hubs: online booking, coordination of humanitarian and business services, resource management

Source: Developed by the authors based on references <sup>[19–21]</sup>.

Table 7. Regeneration model of war and post-war reconstruction of Ukrainian cities.

Strategic Vector	Frontier Zone	Subject of Responsibility	The Role of Hotels in Urban Regeneration Policy
Security and stabilization	Zone of active hostilities: Donetsk, Luhansk, Kherson, partly Kharkiv, Zaporizhzhia, Mykolaiv	City authorities, military administrations, State Emergency Service, international donors	Temporary closure or conversion to safe shelter for the population and humanitarian operations; minimization of destruction; backup infrastructure
Safety-adaptive	Frontline zone of increased risk: Chernihiv, Sumy, partly Kharkiv, Dnipropetrovsk, Odesa	City authorities, territorial communities, volunteer organizations, law enforcement agencies	Protection and adaptation of hotels against missile strikes and partial attacks; participation in coordinating the evacuation and placement of IDPs
Buffer	Border buffer zone: Zhytomyr, Rivne, Vinnytsia, Kirovohrad	City government, communities, humanitarian organizations, business	Support for IDP reception readiness; temporary logistics and hub functions; partial business tourism
Rear	Rear zone of the frontier: Cherkasy, Kyiv, Poltava	City government, business, territorial communities	Selling business tourism services, charity and volunteer events; supporting the local economy; adapting to periodic threats
Mobility	Frontier mobility zone: Lviv, Ivano-Frankivsk, Zakarpattia, Ternopil, Chernivtsi, Volyn	City authorities, communities, humanitarian organizations, international donors	Reception of IDPs and relocated businesses; support for humanitarian logistics; infrastructure adaptation and formation of new demand models

Source: developed by the authors based on references [3-5,19-21].

The use of the frontier-zone concept for developing regeneration models in urban planning policies enables clear differentiation of risk levels and the functional roles of hotels in post-crisis urban environments, thereby facilitating verification of the hypothesis regarding their contribution to urban adaptation and regeneration.

Accordingly, the frontier zones into which Ukraine’s administrative units are divided include the following groups [21]:

1. Active combat zone (settlements in Donetsk, Luhansk, and parts of Kharkiv, Kherson, Zaporizhzhia, and Mykolaiv regions). These territories are subject to direct shelling, occupation, or constant military threat. They exhibit the most extensive destruction of urban systems and built environments. Some settlements have been completely obliterated and require full reconstruction. Hotels in these frontier territories are often destroyed or closed; those that remain operational may perform critical safety functions, including sheltering civilians, supporting humanitarian logistics, and serving as backup urban infrastructure.
2. High-risk frontline zone (settlements in Chernihiv, Sumy, parts of Kharkiv, Dnipropetrovsk, and Odesa regions). Urban systems adjacent to the front line or the aggressor state are subject to missile attacks and

- face acute security vulnerabilities. As of early 2026, urban infrastructure in these areas has sustained significant damage, including schools, hospitals, and energy nodes [22]. Hotels here are adapted to operate under partial threat conditions, providing accommodation for internally displaced persons (IDPs), supporting evacuation coordination, and sustaining local economic activity.
3. Buffer frontier zone (Zhytomyr, Rivne, Vinnytsia, Kirovohrad regions), which includes territories not directly affected by active hostilities but exposed to elevated risk due to proximity to the front and the presence of strategic facilities. Hotels in these regions function as preparatory and hub platforms for IDP relocation and partially operate as business and logistics centers.
4. The rear frontier zone, represented by the central regions of Ukraine (Cherkasy, Kyiv, Poltava), remains relatively safe but experiences periodic air-raid threats. Kyiv is an exception, facing daily hybrid attacks and substantial urban damage despite strong air-defense systems. Hotels in this zone are reoriented toward business tourism, charitable and volunteer activities, supporting economic vitality while adapting to risk conditions.
5. Mobility frontier zone (Lviv, Ivano-Frankivsk, Za-

karpatia, Ternopil, Chernivtsi, Volyn regions), which is comparatively safer due to geographic proximity to EU and NATO member states, providing a degree of strategic stability and reducing direct military threat. Hotels here operate actively, offering accommodation, logistics, and rehabilitation tourism services. However, the risk of infrastructural overload stimulates the development of new demand models and service adaptations.

From the first years of the full-scale war, practical projects and initiatives emerged even before the cessation of hostilities, already demonstrating features of strategic urban recovery:

1. Programs and institutional initiatives <sup>[23]</sup>. Civil and governmental organizations—including the Urbani-na civic union, the Architectural Chamber of the National Union of Architects of Ukraine, and the specialized Coordination Headquarters for Post-War Recovery—are developing methodologies for comprehensive reconstruction of Ukrainian cities, drawing on post-World War II experience and international practices.
2. Concrete reconstruction cases <sup>[24]</sup>. In de-occupied regions, thousands of residential buildings, schools, hospitals, and administrative facilities have been restored under state programs, alongside support initiatives for affected residents.
3. New reconstruction models <sup>[25]</sup>. Western Ukrainian cities, such as Lviv and Ivano-Frankivsk, are already implementing housing projects, infrastructure modernization, and social-service initiatives that take into account demographic shifts, IDP needs, and new models of urban life.

Within this context, hotel infrastructure increasingly reveals itself not as a supplementary element of the service economy but as a multifunctional component of critical urban infrastructure. Across different frontier zones, hotels perform diverse yet strategically significant functions: from temporary accommodation for IDPs, volunteers, and humanitarian missions to supporting business activity, social integration, and urban economic recovery. This allows hotels to be conceptualized as spatial “anchors” of stability, mobility, and social cohesion within crisis-affected ur-

ban systems.

Thus, the analysis of international post-war reconstruction experience, combined with wartime initiatives in Ukraine, demonstrates that contemporary urban recovery is increasingly characterized by a multidimensional process integrating security, social, economic, cultural, and spatial components. Even amid ongoing hostilities, a new logic of urban recovery is emerging in Ukraine, one oriented not only to the physical reconstruction of destroyed assets but also to the adaptation of urban systems to prolonged crisis impacts, demographic shifts, and growing humanitarian needs.

The findings confirm the study’s hypothesis that, in post-crisis urban systems, hotels, as critical urban facilities, exert a positive influence on adaptation and recovery processes following military conflict, natural and technological disasters, and other large-scale shocks. By combining security, social, economic, and humanitarian functions, hotel facilities can become active agents of spatial regeneration and crisis-responsive urban design.

### **3.3. Modeling the Development of Hotels as Safe and Socially Oriented Spaces in the Urban Landscape**

Modern cities increasingly operate under conditions of permanent instability driven by overlapping security, socio-economic, and humanitarian crises. Armed conflicts, pandemics, climate-related disasters, and large-scale population displacement disrupt established mechanisms for providing housing, mobility, and essential services. Under such circumstances, classical elements of critical infrastructure are not always capable of responding swiftly to rising demand and shifting functional priorities. Consequently, the role of hotels within the city’s security architecture becomes more pronounced. During the full-scale war in Ukraine, hotels adopted proactive response practices and rapidly transformed their functions from commercial (profit-oriented) to social—providing temporary accommodation for residents who lost their homes due to shelling, evacuees, internally displaced persons from combat zones, and humanitarian missions. They also served as logistical and coordination centers. This necessitates a rethinking of the role of hotel infrastructure within post-crisis urban recovery systems as safe and socially oriented

spaces embedded in the urban landscape.

Scholarly literature highlights several systemic advantages of using hotels in crisis conditions. First, hotels enable rapid expansion of a settlement's housing capacity without the need for capital construction, which is critically important during acute humanitarian crises<sup>[26]</sup>. Second, hotels offer higher levels of privacy, safety, and sanitary control compared to mass accommodation centers, positively influencing the psychological well-being of displaced persons and reducing social tension within host communities<sup>[13,21]</sup>. Third, this model alleviates pressure on municipal housing systems, allowing local authorities to focus on developing long-term housing and social-policy solutions<sup>[27]</sup>.

Empirical studies and analytical reports by international organizations indicate that during military, humanitarian, and epidemiological crises, hotel infrastructure in European Union (EU) countries undergoes significant functional transformation<sup>[3-5,16,27]</sup>. Although full-scale warfare within the EU is limited, hotels have been actively involved in responding to secondary crises, particularly pandemic-related migration flows<sup>[28]</sup>. During the COVID-19 pandemic, classified as a security-type crisis, countries in Southern and Western Europe repurposed large numbers of hotels into quarantine facilities, isolation centers, or alternative medical sites. According to the World Health Organization, in Italy and Spain, at peak periods, 25–30% of urban hotels were used to accommodate medical personnel or patients with mild symptoms, significantly reducing the burden on hospitals and enhancing the resilience of health-care systems<sup>[29]</sup>.

Similar patterns of functional adaptation were observed during major migration crises, including in 2015–2016 and after 2022. One of the most significant functions of hotel infrastructure during these periods was the provision of temporary housing. Unlike specialized accommodation centers, hotels offer conditions that preserve dignity, privacy, and psychological comfort for forcibly displaced individuals. In Germany, France, Austria, and Poland, hotels became an essential component of refugee-reception systems, providing medium- and long-term accommodation for individuals who could not be promptly integrated into municipal housing stock<sup>[30-32]</sup>. According to the Organisation for Economic

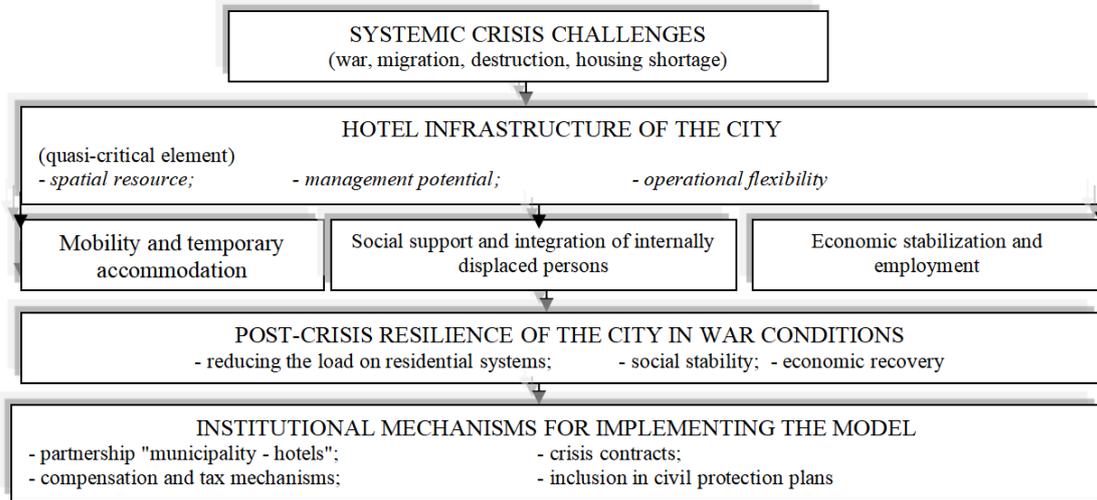
Co-operation and Development (OECD) data, in several regions, 20–40% of collective temporary accommodation places during the initial months of crisis response were provided by hotels and aparthotels<sup>[33]</sup>.

Hotel infrastructure is increasingly conceptualized in academic literature as an adaptive quasi-critical infrastructure capable of supporting social stability and functional integrity of urban systems in crisis and post-crisis conditions. At the same time, researchers emphasize the need to institutionalize these practices through formalized public-private partnership mechanisms, which would enhance crisis-management efficiency and reduce long-term socio-economic risks<sup>[21,34,35]</sup>.

The above considerations demonstrate that hotel infrastructure performs an important stabilizing function in the economies of post-crisis cities. Even under conditions of reduced tourist demand, hotels preserve jobs, support related industries, and contribute to local budgets. Moreover, functional diversification, such as repurposing hotels into office, medical, or coordination spaces, helps minimize economic losses and accelerates urban economic recovery. Thus, the hotel sector functions not only as an object of support but also as an active participant in economic stabilization (**Figure 2**).

Thus, the full-scale war in Ukraine since 2022 has created unprecedented challenges for the functioning of urban systems, in particular in terms of operational provision of temporary housing for internally displaced persons, humanitarian and international missions, as well as emergency response services<sup>[36]</sup>. During 2022–2025, hotels and other accommodation facilities played a supporting but strategically important role in the system of temporary accommodation for internally displaced persons, performing the functions of adaptive elements of urban infrastructure.

The generalized results of the study<sup>[36,37]</sup> indicate that in the conditions of the military crisis in Ukraine, hotels actually perform the functions of operational hubs of social support, combining housing, humanitarian and service infrastructure. The scale and regularity of the involvement of hotel facilities in the accommodation of internally displaced persons and humanitarian missions actualize the need not only for physical, but also for digital integration of hotel infrastructure into the system of urban management and social services.



**Figure 2.** Conceptual model of hotel infrastructure integration into post-crisis urban resilience.

Source: Developed by the authors.

In view of the above, it is promising to use existing state and municipal digital ecosystems, in particular the Diya platform, Kyiv Digital city applications, as well as local digital services of other cities as coordination interfaces between authorities, the hotel business and service users

(Table 8). The integration of hotels into such digital environments can provide operational accounting of available accommodation, verification of IDP status, coordination of humanitarian flows, access to municipal support programs and feedback to city services.

**Table 8.** A model for integrating hotels into urban digital services in the context of frontier urban systems.

Frontier Zone	City Digital Services	Digital Integration Features	The Role of Hotels in the Urban Regeneration System
Active combat zone	Diia.ua, OpenKharkiv, eDnipro, local alert systems	Threat alert, crisis coordination, navigation to dangerous sites	Temporary shelters, crisis hubs for critical service personnel, logistics points
Frontline zone of increased risk	Diia.ua, eDnipro, Misto (Odesa), regional security services	Information, population mobility management, access to assistance services	Safe spaces for short-term stays, support for humanitarian missions
The buffer zone of the frontier	Diia.ua, city community portals, citizen appeal services	Communication with the community, coordination of social services	IDP social integration centers, temporary accommodation and adaptation spaces
The rear zone of the frontier	Diia.ua, Kyiv Digital, municipal service platforms	Access to urban services, mobility, urban flow management	Business hotels as infrastructure to support economic activity and institutions
Frontier mobility zone	Diia.ua, Lviv City Helper, tourist and migration services	Navigation, residential services, humanitarian logistics	Hubs for IDPs, volunteers, relocated businesses; socially oriented spaces
Post-war recovery areas	Diia.ua, Restorative digital community platforms (in the future)	Reconstruction planning, citizen participation, transparency of decisions	Anchors of spatial regeneration, centers of urban service renewal

Source: Based on data from European Commission [38].

The proposed model reflects the multi-level integration of hotel infrastructure into the city’s digital ecosystem, where hotels function not only as actors within the tourism market but also as adaptive elements of quasi-critical urban infrastructure. Accordingly, the digitally integrated hotel, as an instrument of the city’s marketing frontier, becomes a multifunctional component of urban infrastructure. Through integration with digital platforms at the national, municipal, and local levels (including e-governance sys-

tems, smart-city services, and digital social applications) it performs not only service-commercial functions but also stabilization, security, social, and communication functions. Within the marketing frontier, such a hotel enhances the adaptability of urban space to crisis and post-crisis challenges, supports economic activity, strengthens social cohesion, and contributes to the reputational resilience of the city, acting as a quasi-critical element of its financial security.

In turn, digital platforms at the national and municipal levels provide institutional legitimacy for hotels' participation in crisis management. At the same time, operational and social services enable them to fulfill their role as safe spaces for temporary accommodation, social support, and human-capital recovery. In Ukraine, there is an e-support program on the state digital platform Diya, the funds from which can be spent on paying for a hotel<sup>[39]</sup>. In addition, after crises, city government programs operate with hotels to accommodate victims and internally displaced persons with compensation for the cost of accommodation (full or partial)<sup>[40]</sup>.

Thus, it can be concluded that integrating the hotel sector into digital municipal platforms and urban-service applications represents one of the most promising directions for coordinating the recovery of cities most affected by the war. At present, while the battle continues, digital applications enhance transparency in hotel-based accommodation, improve the speed of managerial decision-making, and increase the efficiency of existing infrastructure use. These digital urban services lay the foundation for transitioning from situational use of hotels during crises to an institutionalized model of public-private cooperation, in which hotels become an integrated component of the city's digital ecosystem.

## 4. Discussion

The epistemological frameworks of urban planning and organization are shaped by the collinear influence of global factors (such as the concentration of economic activity in key urban nodes) and local factors (including natural and anthropogenic pressures on territorial systems). However, the contemporary world faces constant threats from destructive natural and human-induced disasters. These challenges imbue urban processes with new meanings and developmental trajectories, where the resilience of physical structures and the safety of housing and infrastructure become imperative. Therefore, crisis-responsive urban design should be understood as a synthesis of several conceptual approaches, among which the theories of Urban Resilience, Urban Anchors, and Social Capital play a central role. These theoretical frameworks provide valuable insights for advancing the objectives of this study.

The academic field of Urban Resilience is rich in scholarly research. The concept views cities as systems capable of adapting, absorbing shocks, and rapidly recovering from wars, disasters, and crises. For instance, the work of Caldarice O., Brunetta G., and Tollin N.<sup>[6]</sup> analyzes the significance and values of urban resilience, addressing current challenges and prospects for strengthening it.

The article by Hosseinioon S.<sup>[7]</sup> focuses on resilience as a means to overcome uncertainty and enable adaptation in complex built environments. Using three districts of Golestan (Tehran, Iran) with varying levels of formalization as case studies, the research compares how urban design and modernization tools influence the adaptive capacity of urban territories. Importantly, informality is interpreted not as a problem but as a source of adaptive practices that can enhance the resilience of the built environment.

Adaptive urban policies in the context of acute natural hazards have been examined by scholars such as Ferreira K. and Abiko A.<sup>[8]</sup>, who identified tools for managing landslide risks (including weather monitoring, susceptibility mapping for gravitational mass movements and flooding, risk-reduction planning, and geotechnical mapping to illustrate urbanization potential). Wardekker A.<sup>[9]</sup> emphasized two essential formulations of urban resilience: "system resilience" (the maintenance of urban functions and processes) and "community resilience" (social cohesion and self-sufficiency).

The study by Ahern J.<sup>[10]</sup> addresses ecological considerations in landscape planning and design projects. He argues that cities require diversity, multi-scalar networks, connectivity, and adaptive planning and design. A similar perspective is offered by Cedeño-Valdiviezo A.<sup>[41]</sup>, who highlights the importance of creating eco-districts as livable and sustainable urban environments. In his work, resilience entails multifunctionality, the ability to reorganize space rapidly, and access to autonomous resources and digital solutions.

At the same time, let us consider the findings of Yıldız N. and Sogut M.<sup>[17]</sup>. They identify urban hotels as essential components of Urban Resilience, combining the functions of commercial infrastructure, social inclusion, and adaptability of the urban environment. Ensuring barrier-free access, autonomous use of spaces, and compliance with accessibility standards enhances both the social and

functional resilience of hotels, enabling them to respond effectively to changing user needs and crises.

Thus, the concept of Urban Resilience encompasses approaches to designing urban environments in the face of destruction caused by natural disasters, terrorist attacks, and other crisis threats. For hotels, as part of urban infrastructure, responding to these challenges takes on a dimension of social responsibility, as they can perform expanded functions during emergencies: serving as temporary coordination centers and safe, comfortable shelters. Accordingly, the role of hotels in urban design extends beyond aesthetic contributions to the cityscape and becomes an essential element of civil-protection systems.

In turn, the concept of Urban Anchors describes key (critical) urban infrastructure that performs stabilizing, integrative, and catalytic functions in urban development. Traditionally, such objects include universities, hospitals, cultural centers, transport hubs, and extensive service facilities capable of generating flows of people, economic activity, and social connections within the city. In the context of military aggression, as in Ukraine, critical infrastructure increasingly faces complex threats, where decisive risks arise not only from cyberattacks but primarily from physical (kinetic) damage – highlighting the need for stabilizing practices by municipal authorities. These aspects are reflected in the works of Setola R. <sup>[1,2]</sup> and Dong L. and Lee J. E. <sup>[42]</sup>, who emphasize that infrastructure resilience cannot be viewed in isolation, as cascading effects and interdependencies across sectors (energy, communications, transport, housing) generate systemic risks.

Within this logic, the antecedents of Urban Anchors emerge as elements of systemic urban security that integrate physical presence, organizational continuity, and digital support. Urban hotels can maintain safety, accessibility, and continuity of urban processes under conditions of uncertainty, performing functions of temporary accommodation, coordination, and social initiative. Due to their strategic location, stable presence in the urban environment, and capacity for functional transformation, they act as stabilizing nodes within the urban system.

Following the Urban Anchors framework, it can be concluded that hotel infrastructure, when integrated into crisis-responsive urban planning, can form new temporary and permanent “points of attraction” that accelerate the

restoration of urban mobility, social resilience, and economic activity.

In contrast to the dominant models of urban resilience and post-crisis development in the scientific literature, in which hotels are mainly considered as commercial elements of the urban economy, the presented study records a shift towards prioritizing their humanitarian function. The novelty of the study lies in the functional reconfiguration of the role of hotels in the structure of the critical infrastructure of post-crisis cities. Thus, based on practical insights from Ukrainian cities, it is shown that hotels are transformed from market-oriented institutions into hybrid urban nodes that provide temporary accommodation for affected residents, humanitarian coordination, and stabilization of urban flows in crisis and post-crisis phases. In this sense, hotels are conceptualized not as auxiliary or temporary solutions, but as active agents of urban adaptation and recovery, which expands the theory of urban resilience by emphasizing the adaptive potential of private, service-oriented infrastructure.

Finally, let us consider the conceptual research on Community Resilience and Social Capital, which is highly relevant for shaping crisis-responsive urban design. Strengthening resilient urban environments through social capital is reflected in the works of Agboola O. P. et al. <sup>[43]</sup>; Chou R. J. and Huang F. T. <sup>[44]</sup>; and Lv Y. and Sarker M. N. I. <sup>[45]</sup>. In his book, Aldrich D. P. underscores the critical role of social capital in enabling communities to withstand natural disasters and restore urban infrastructure and social ties—the foundational elements of any community <sup>[46]</sup>. His conclusions are based on analyses of responses from four communities to disasters: Tokyo after the 1923 earthquake, Kobe after the 1995 earthquake, Tamil Nadu after the 2004 Indian Ocean tsunami, and New Orleans after Hurricane Katrina.

Tourism plays a vital role in crisis-responsive urban design. The study by Young M. <sup>[18]</sup> underscores the significance of social capital and adaptive approaches to strengthening community resilience in the context of tourism. The author analyzes the case of Mae Kampong in Northern Thailand, demonstrating that community resilience should not be viewed as a final state but as an iterative process involving learning, adaptation, and transformation in response to change. In particular, the development of Com-

munity-Based Tourism (CBT) reinforces social ties, generating both positive and negative manifestations of social capital, which in turn enhances a community's ability to cope with uncertainty and crises. This approach shows that effective implementation of resilience strategies requires a deep understanding of local resources, assets, and community capacities, as well as the establishment of feedback mechanisms between initiatives and development outcomes.

Similar considerations are reflected in the work of Balaji Rao et al. <sup>[47]</sup>. Their research demonstrates that cities with strong social networks are better able to mobilize resources and coordinate collective action during crises. At the same time, reliable infrastructure systems ensure service continuity and accelerate recovery. Therefore, an integrated approach to urban planning is needed—one that combines community engagement, equitable resource distribution, and adaptive infrastructure design.

It is important to note that hotels integrate into urban design as socially oriented actors, contributing to enhanced social cohesion, a sense of safety, and the restoration of local communities. They create spaces for interaction, strengthen social ties and trust, and foster a sense of “returning to normality.” Moreover, hotels are among the few types of infrastructure capable of rapidly assuming the role of social hubs after a crisis, providing shelter, support points, and communication spaces.

Evaluating these studies on Community Resilience and Social Capital through the lens of crisis-responsive urban design makes clear that building resilient urban systems requires integrating social capital, flexible structures, and adaptive mechanisms that enable cities and communities to respond effectively to emergencies and long-term challenges. In this process, hotels play a crucial role by providing temporary housing and evacuation hubs, creating business hubs and centers for restoring economic activity (especially during severe blackouts), offering cultural and social spaces, serving as anchor points for tourism and migration flows, and functioning as rapidly deployable service facilities. Thus, hotels should be classified as elements of critical infrastructure within crisis-responsive urban design.

At the same time, the integration of hotel infrastructure into the anti-crisis urban planning system is associat-

ed with several potential limitations and risks that require critical reflection. First, the excessive dependence of urban systems on business entities can exacerbate governance imbalances, especially in the absence of a clear regulatory framework or coordination mechanisms between government and business. Second, the commercialization of recovery processes can reproduce or deepen social inequalities, limiting access to quality temporary housing for vulnerable groups. Third, the continued use of hotels as quasi-social infrastructure without adequate compensation or institutional support creates risks of economic instability for the hotel sector and may reduce its ability to participate in long-term recovery processes. In this sense, the effective integration of hotels into the critical infrastructure of cities requires coordinated regulatory, economic and management mechanisms at the national and municipal levels, as well as transparent boundaries of corporate social responsibility. At the same time, the results of the study outline the direction of further scientific and practical developments aimed at forming such mechanisms within the framework of post-crisis urban planning.

## 5. Conclusions

The article examines key references from international urban-regeneration experience and proposes potential scenarios for the post-war recovery of Ukrainian cities. Within the proposed concept of crisis-responsive urban design, a multi-level structure of wartime (and post-war) urban regeneration has been identified. This structure encompasses physical and material reconstruction, institutional and governance transformations, socio-cultural renewal, economic and labor revitalization, as well as value-identity and ecological-climatic transitions. Such a multidimensional process ensures the restoration of urban viability as an integrated, sustainable post-crisis system capable of functioning under prolonged risks, uncertainty, and recurrent shocks, while meeting new security, social, and environmental compliance requirements.

Based on an analysis of international examples of urban recovery following disasters and military aggression, three groups of regeneration models with the highest potential for adaptation in Ukraine were identified: a) security-integrated models, in which architecture and service

infrastructure are designed with constant risks in mind; b) post-war tourism-oriented models, where hotel infrastructure acts as a catalyst for economic activity and spatial renewal; c) post-disaster rapid-response models, which demonstrate effective mechanisms for scaling and standardizing reconstruction solutions.

Considering the preconditions of the war, the nature of infrastructure destruction, and the scale of environmental contamination in Ukraine, several regeneration strategies were proposed, each based on a specific set of instruments: a) cultural-identity regeneration, which uses historical memory and cultural heritage as the foundation for shaping a new urban identity; b) institutional-governance transformation, focused on profound restructuring of urban governance systems to enhance crisis preparedness and ensure effective strategic planning through specialized recovery agencies or offices; c) economic (reconstruction-investment) strategy, aimed at stimulating the urban economy through infrastructure projects and business incentives; d) social-integration and psychosocial strategy, oriented toward rebuilding social capital, overcoming collective trauma, and fostering new community solidarity.

The authors argue that the successful recovery of Ukrainian cities is possible only through the integration of cultural, governance, economic, and social components, alongside ecological sustainability and infrastructural adaptability.

Throughout the discourse, the authors demonstrate the significance of hotels and other accommodation facilities as catalysts of spatial and social regeneration in post-crisis urban environments. It is shown that, in the context of their evolving urban role, hotels should be regarded as critical infrastructure. Their functions during wartime and post-war recovery may include:

- Providing temporary housing for thousands of internally displaced persons and humanitarian missions, thereby preventing critical overload of municipal housing stock;
- Serving as logistical hubs for volunteers, rescue teams, and humanitarian convoys is essential for personnel rotation and maintaining the mobility of emergency services.
- Functioning as social hubs offering essential services, including food provision, medical assistance,

and psychological support;

- Operating as mobile and coordination points for humanitarian and military-logistical operations due to their strategic locations in city centers and along transport corridors;
- Acting as regional or local economic stabilizers by maintaining operational activity, preserving jobs, and contributing to local budgets despite reduced tourist flows;
- Providing spaces for rehabilitation and respite for those requiring short-term comfort, safety, and access to alternative sources of uninterrupted electricity, water, and heating.

Within this logic, the hotel becomes a hybrid infrastructure that combines market mechanisms with elements of social and humanitarian mission, contributing to threat resilience and population protection. Hotels can function not only as operational hubs of social support (integrating housing, humanitarian, and service sectors), but also as proactive enhancers of urban adaptive capacity, serving as spaces for dialogue, learning, cultural identification, and support for vulnerable groups.

Accordingly, the authors propose the conceptual Hotel Urban Resilience Model (HURM), in which hotels transform from business entities into key components of urban recovery and viability in post-crisis urban systems. As service-infrastructure facilities with a high degree of functional flexibility, hotels can be included in the category of critical urban facilities capable of providing temporary accommodation, shelter, autonomous operation during blackouts, and logistical support to the population and key stakeholders. They perform security, social, humanitarian, and stabilization functions under crisis conditions following military conflict, natural and technological disasters, and other large-scale shocks.

The article also proposes models for integrating hotel infrastructure into the urban ecosystem. Through interaction with digital services of e-governance, social protection, and crisis management, hotels can serve as temporary housing, humanitarian and communication hubs, and instruments for supporting local economies and the international image of urban territories. This confirms the study's central hypothesis that, under wartime and post-war transformations, hotel infrastructure can and should be regarded

as an integrated spatial-economic resource for recovery, resilience, and long-term security of Ukrainian cities.

Thus, the transition from situational use of hotels during crises to an institutionalized, digitally supported model enables hotel infrastructure to be conceptualized as an element of an innovative, resilient, and socially oriented urban landscape. This creates the foundation for further modeling of hotels as safe and adaptive urban spaces during wartime and post-war periods.

Hotel infrastructure plays a multidimensional role in post-crisis urban systems, ensuring mobility, social support, temporary accommodation, and economic stabilization. Crisis experience demonstrates that hotels can effectively complement traditional elements of critical infrastructure and strengthen urban resilience. Integrating hotel infrastructure into urban development and recovery strategies should therefore be considered a priority direction of contemporary urban policy.

The study thus advances urban resilience theory by demonstrating how hospitality infrastructure can function as an adaptive socio-infrastructural anchor in post-crisis cities.

## Author Contributions

Conceptualization, L.B. and L.H.; methodology, A.R.; formal analysis, L.B.; investigation, L.B. and L.H.; data curation, L.H.; writing—original draft preparation, L.B.; writing—review and editing, A.R.; visualization, L.H.; supervision, A.R.; project administration, L.B. All authors have read and agreed to the published version of the manuscript.

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volved in the study.

## Data Availability Statement

The datasets generated and analyzed during the current study are available from the corresponding author on reasonable request.

## Conflicts of Interest

The authors declare no conflict of interest.

## Abbreviations

SME—Small and Medium-Sized Business

IDP—Internally Displaced Persons

SES—State Emergency Service of Ukraine

NGO—Non-Governmental Organization

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