

## Article

# The Reconstruction of Post-War Cities—Proposing Integrated Conservation Plans for Aleppo's Reconstruction

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**Abstract:** The reconstruction of historic cities is a complicated challenge that has been faced using different principles diachronically. Historic cities that have suffered severe damage are areas that need to be replanned to preserve their urban characteristics and adjust to their residents' needs. This paper aims to examine the principles of urban preservation according to the terms of Historic Urban Landscape (HUL) principles, which consider historic centers as living organisms that need to be adjusted to modern society's needs. The examined case study is the historic center of Aleppo and its post-war reconstruction. The research focuses on the five physical elements below: the site's morphology, geomorphology, and natural features; its built environment, historic or contemporary; its infrastructures; its open spaces and gardens; its land use patterns and "spatial organization". It proposes policies and spatial forms for its reconstruction according to the HUL's principles: more specifically, it proposes plans and strategies for the historic center's regeneration in the fields of land uses, building regulations, transportation networks, and green public spaces, taking into account several factors: the inhabitants, the stakeholders, UNESCO's regulations, and the cultural value of the built environment. Finally, it underlines the importance of community engagement for the city's regeneration in terms of HUL.



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**Keywords:** urban conservation; historic urban landscape; Aleppo; civilian war; reconstruction

## 1. Introduction

Cultural heritage today includes all remains that document human beliefs, activities, and achievements throughout time and whose preservation is necessary for spiritual and mental balance, quality of life, and the cultural identity of current and future generations [1]. Urban cultural heritage, both tangible and intangible, are sources of social cohesion, factors of diversity, and drivers of creativity, innovation, and urban regeneration. Historic urban areas are affected today by rapid urbanization, loss of public spaces and facilities, improper infrastructure, urban poverty, climate change, and conflicts that threaten their local identity and visual integrity.

Urban growth has transformed the essence of many historic urban areas. The Historic Urban Landscape approach may assist in managing and mitigating such impacts. Climate change and new dynamic forces of development (e.g., tourism and armed conflicts) threaten historic cities, facts that made the international community propose and legislate actions for their conservation. Today, armed conflicts have caused severe damage in historic areas around the world. Preserving these areas is a complex procedure that must combine cultural, political, social, and economic factors. It includes aspects such as history, economy, sociology, population, and infrastructure such as roads, networks, and open spaces. The primary goal is preserving the city's identity, re-establishing safety, and protecting all the historic city's components, both historical and modern.

This paper focuses on Syria and the city of Aleppo, which has suffered massive damages due to its civil war. Syria has several historic centers and neighborhoods, many of

which have been destroyed. This distraction displaced citizens from their cities and proved catastrophic for cultural sights of significant sociocultural value, facts which make the reconstruction of these cities necessary. According to modern conservation principles, post-war recovery of historic areas must be based on a strategy that integrates developmentalism with social change and reconciliation [2].

The tool that will be examined in the current paper for the case study of the conservation and reconstruction of Aleppo's historic center is the principles of Historic Urban Landscape (HUL), which UNESCO promulgated in 2011 as a critical guide for the process of World Heritage Sites for historic areas' conservation in terms of social inclusion, environmental protection, economic development, and cultural conservation. The current research will analyze and evaluate the urban and morphological features of the city after the war, and it will propose strategies for Aleppo's replanning in terms that are compatible with HUL principles. The primary aim is to propose plans and strategies adjusted to the case study's particularities, combining urban conservation and integrated development.

## **2. Urban Conservation Policies for the Reconstruction of Historic Cities during the 20th Century**

In the 19th Century, the industrial revolution brought sweeping changes to cities as the urban population constantly increased. For example, fortifications, which are structural elements of almost every European city, were an essential limit on the expansion of cities, leading to the vertical increase of urban density. Although the destruction of city walls was seen as a way to accommodate the growing population, it failed to enhance the quality of life for residents. From the 19th Century to the present, concern for the protection of cultural heritage gradually faced many changes [3].

One of the first approaches to urban regeneration was Georges-Eugène Haussmann's proposal for Paris which was carried out between 1850 and 1870 [4]. He aimed to improve the lives of the city's inhabitants by implementing various changes, such as large-scale demolitions to make way for parks and modern transportation systems. Additionally, he sought to enhance the city's image and reputation by opening and designing new avenues. This large-scale intervention constituted the transition to modern urban planning [5].

John Ruskin and William Morris supported preserving the historic city as they believed it was a heritage that should be conserved [6]. The urban engineer's movement set the basis for modern urban planning. Its basic principle was that the historic city should be demolished and replaced by a new city with modern infrastructures, social housing, and open public spaces [7]. The historic city was considered a decayed area that should be replaced by new structures that provide better hygiene conditions. Le Corbusier proposed replacing historic buildings and forms with modern high structures, providing open spaces and spaces for road infrastructures. During the following years, several agreements were signed to safeguard cultural heritage during conflict, including the Hague Agreements in 1899 and 1907, the Charter of Athens, and the Covenant of Washington. However, these agreements only acknowledged the importance of protecting cultural property without providing specific regulations, measures, or limitations to ensure such protection. [8].

The Second World War caused significant human and material losses and ended with many destroyed European historical centers. Depending on the goals that the respective authorities set for the future of their city, the planners either adopted the pre-war standards of modernism or sought new approaches to the issue of historic urban regeneration. The war destructions allowed modernist urban planners to reshape European cities according to the principles of the Modern Movement, as the large urban voids caused by demolitions were a new field for experiments [9]. The case of Rotterdam was a characteristic example, as planners used the opportunity to transform key structural elements: the liquidation of the moats, changes to the structure of functions, and the scale and shape of buildings altogether. On the other hand, cities such as Warsaw followed a different approach: the detailed reconstruction of the cities as they used to be. The destruction caused by the Germans was an attempt to remove the capital city, the brain, and the intelligence of the Polish

nation [10]. The city was reconstructed in its previous form to show that cultural heritage and, subsequently, the country's civilization, survived despite the efforts for its destruction.

The time frame spanning from the conclusion of World War II until the 1950s witnessed significant and drastic transformations to the historic urban landscape, which had deteriorated due to its dense construction and gradual degradation. As a result, it was regarded as an area of urban decline and subjected to extensive and radical interventions. During this period, the first international conventions and international organizations were founded, UNESCO, the Council of Europe, the International Center for the Study of Conservation and Restoration of Cultural Property (ICCROM), the International Council of Museums (ICOM), the International Council of Monuments and Sites (ICOMOS), and other organizations, aiming to form a framework for the protection of cultural heritage.

The focus was on addressing the urgent housing needs and the reconstruction of historic urban centers, and so little importance was given to the form and aesthetic of the newly constructed buildings, which led to the alteration of the historic centers' forms and identities. It gradually became evident that the application of modern planning principles to the reconstruction of historic centers led to poor housing quality, monotonous and repetitive urban spaces, and social marginality. The large-scale radical interventions resulted in the gradual gentrification of the historic centers, as the pre-war residents had to relocate to other areas until the completion of the projects. However, after the completion of the works and due to the increased financial demands, pre-war residents could not afford the new rent prices, so they were displaced [6]. From 1960 to 1980, there was a gradual rejection of modernism in urban planning standards and a promotion of a more social approach to spatial planning. The comprehensive planning of the first post-war years was replaced, in the early 1960s, by the "Master Plan" approach, which offered a vision for the entire city [11]. This was a universal design that reflected the state's vision for the cities in the future and was designated to local authorities for implementation. However, these plans received severe criticism and were soon rejected, as they did not provide a solution to the problems of the cities, but rather somewhat modified and rezoned them. Modern building types and technologies seemed fit to cope with the urgent and extensive needs of post-war reconstruction, while, simultaneously, policymakers showed little interest in conservation during the first two decades after the war.

The 1970s were characterized by the "Urban Renewal" approach, which aimed to upgrade entire areas or neighborhoods by demolishing downgraded buildings and rehabilitating historic areas. The successful execution of these projects relied on the collaboration between the authorities and the residents, which established the groundwork for the participatory planning trend. This more social approach, involving residents in the decision-making and design process, was promoted by postmodernism, which contrasted with the interventions imposed until then [12].

In the 1980s, urban regeneration was the primary tool for the promotion of a new image of the city, through the trend of "New Urbanism". In the plans of this era, smaller-scale interventions were the main tool for historic centers' regeneration, which aimed to consolidate a specific character of each area. Gradually, the historic centers were exploited, and the cultural heritage was commercialized as cultural capital drives economic growth to attract investors, residents, and visitors. All these efforts to create an attractive place to live and work led to the gentrification of historic centers and social exclusion [13].

Since the 1990s, in the context of globalization and environmental protection, the basic aim of spatial planning has been to reduce urban sprawl and revive the central areas of historic cities. The regeneration projects for the revitalization of historic centers continued the commodification of the historic urban fabric and intensified gentrification. Despite the efforts for the adoption of a sustainable city model, economic growth is still a factor that shapes historic centers in the modern era, a fact that leads to a serious risk that city dwellers will lose their sense of belonging and gradually become marginalized, while the character and form of cities will be irreparably altered [3].

Modern conservation approaches provide a basis for the development of experiments, which, to different degrees, reflect modern societies. The true essence and origin of the historic city can be uncovered by scrutinizing its structural characteristics, layering processes, and the development of collective and individual value systems, both at the micro and macro level, over time [6].

### 3. The Historic Urban Landscapes Approach for Historic Cities Reconstruction

Historically, the main reason for destroying a city during an armed conflict was to destroy the enemy's ability to sustain the war and to govern the enemy's center of gravity [14]. Civic wars, for example, take place in the cities, including gang warfare, violent crime, terrorism, religious and sectarian riots, and spontaneous or violent protests [15]. The first attempt at protecting cultural property from armed conflicts was in the Hague Convention (UNESCO 1954), which stated that signatories of the convention would protect cultural property by refraining from any act of hostility directed against it.

In 1999, the Second Protocol to the Hague Convention stated that avoiding or minimizing collateral damage to cultural property is necessary in the justification for a legitimate military action, and occupying powers should not interfere with or destroy the cultural or historical evidence of occupied territory [16].

In 2005, with "the Vienna Memorandum on 'World Heritage and Contemporary Architecture: Managing the Historic Urban Landscape' the 15th General Assembly of States Parties" to the World Heritage Centre adopted the declaration on the conservation of "Historic Urban Landscapes" (HUL) [17]. According to its definition, Historic Urban Landscape (HUL) supports that the historic city connects both tangible and intangible heritage components in its 'topographical' and 'environmental' contexts, which is understood in the broader territorial and landscape context, expressing 'specific economic and sociocultural values', and constantly evolving. The basic idea of HUL is that it considers the town or urban area as a process rather than an object. The UNESCO Recommendation on the Historic Urban Landscape believes in the challenges of historic urban conservation in spatial, strategic planning, and urban development [4].

HUL's basic concept is that it integrates the goals of urban heritage conservation with social and economic development goals, as cultural heritage is an essential asset for cities and economic, social, and cultural development, with the preservation of both tangible and intangible qualities. Therefore, the primary aim of this approach is to promote interventions that increase the sustainability of built historic capital conservation and promote social and economic development and cultural diversity, in terms that support and strengthen local communities [18]. The HUL approach is based on the connection of the present with the past, which can be promoted with the creation of flexible spaces for many different functions, the connection of the historic city with the new city, the decomposition of the different parts of the city, the historic fabric's retrofitting [6], and through addressing the issue of integrated planning of the urban development and heritage conservation process.

The main goals of HUL's approach, as they are described in the "New life for historic cities," UNESCO's brochure, are to:

*( ... ) Undertake a full assessment of the city's natural, cultural, and human resources.*

*Use participatory planning and stakeholder consultations to decide on conservation aims and actions; assess the vulnerability of urban heritage to socio-economic pressures and impacts of climate change; integrate urban heritage values and their vulnerability status into a wider framework of city development.*

*Prioritize policies and actions for conservation and development, including good stewardship.*

*Establish the appropriate (public-private) partnerships and local management frameworks.*

*Develop mechanisms for the coordination of the various activities between different actors*

*( ... ) [19].*

The above will be achieved by developing regulatory systems that manage tangible and intangible components and social and environmental values of urban heritage with community engagement tools, and developing visions for safeguarding cultural heritage [20].

The implementation of the Historic Urban Landscape Approach for the management, recovery, and reconstruction of historic urban areas should reduce the impacts of climate change, strengthen social inclusion, and enhance economic development under the basic principle of conserving the area's cultural capital.

The key factor for conserving the historic city is establishing a sustainable, balanced, and integrated management process, which requires a clear vision based on the values that need to be protected. The HUL approach is based on integrating the added value of cultural capital in the entire changing function of the city through establishing a strong relation between historic conservation and sustainable development [20].

#### 4. Materials and Methods

Historic cities are complex layers of urban settlements diachronically developed with different principles according to political, economic, social, and environmental conditions. The HUL acknowledges the diversity of forms and meanings that have been passed down from the past within the historic fabric. The most critical issues of historic cities today are:

1. The re-composition of the different parts of the city;
2. The creation of flexible spaces for multiple functions;
3. The connection with the territorial scale;
4. The retrofitting of the historic fabric to support the historic city's identity, increase its attractiveness, and promote a better quality of life for its residents [18].

The case study of the current paper is the historic center of Aleppo, which has suffered damages due to conflict and today needs to be replanned in terms of historic conservation and sustainable development with respect to its particularities. The methodology of the case study is based on the identification of the required elements for the reconstruction of historical and cultural elements of the examined area. In this context, the method will be based on the mechanism of historical mapping, which provides for the following stages:

1. Identification of cultural and historical elements;
2. Inventory of cultural and historical objects;
3. Identification of the damage degree of cultural and historical sites;
4. Planning proposal preparation based on HUL's principles [6].

The HUL recommendations define the broader context of the historic area to include five physical elements:

- (i) The site's morphology, geomorphology, and natural features;
- (ii) Its built environment, historical or contemporary;
- (iii) Its infrastructures;
- (iv) Its open spaces and gardens;
- (v) Its land use patterns and "spatial organization".

The current paper will examine these sectors of Aleppo's historic city. It will analyze the historic city before and after the war's destruction and it will propose policies and plans for its reconstruction according to HUL's principles. The research will answer the following questions:

How can Aleppo be replanned to encourage its rehabilitation in terms of social cohesion? How can the networks of mobility and open spaces function as areas that serve their society's modern needs and additionally serve the area's historic conservation? How should construction regulations be defined regarding the morphology of the existing urban structures?



## 5. The Case of Aleppo

Aleppo (Figure 1), situated in the northern plains of Syria, is renowned as one of the oldest continuously inhabited cities globally, owing to its position between diverse trade routes. Throughout history, many dynasties, such as the Hittites, Assyrians, Akkadians, Greeks, Romans, Umayyads, Ayyubids, Mamluks, and Ottomans, have ruled Aleppo. The city's unique urban fabric was formed by the remnants of these past civilizations, which are still visible today, resulting in a rich cultural heritage exemplified by landmarks such as the Citadel of Aleppo [21]. The Citadel, situated on the highest hill of the walled city, overlooks the Suqs, mosques, and madrasas [22]. Aleppo's strategic location enabled its connection with external influences and international trade. It has been a vital hub for silk trading for several years. It retains its historic market, Al Madina Souk, located west of the Citadel, following the Hellenistic–Roman grid. The market is the world's most massive covered market [23].



**Figure 1.** Aleppo's view. Available online: <https://www.publicdomainpictures.net/en/view-image.php?image=211988&picture=aleppo-city-syria> (accessed on 24 January 2023).

In 2011, Aleppo was the largest city in Syria, serving as its industrial capital, with a population of approximately 3 million inhabitants and 125 neighborhoods, including 22 informal settlements [24]. It was also home to a diverse and multicultural community, encompassing various social and religious groups such as Christians, Kurds, Alawites, Circassians, Turkmen, Yezidi, and Ismaili [25]. Additionally, Aleppo's historic center had been recognized as a UNESCO World Heritage Site. Despite enduring numerous invasions and historical periods, the city's historic fabric remained nearly intact until it gained independence from the French Mandate (1920–1946) [26]. However, since the civil war broke out in 2011 between the Syrian regime and opposition forces, many catastrophic events have impacted both the built environment and the livelihoods of citizens. By 2016, as the war concluded, Aleppo's inhabitants began returning to the city, necessitating urgent efforts for its regeneration. Furthermore, a recent earthquake has highlighted the need for the city's strengthening and revitalization.

### 5.1. Aleppo before the War

Aleppo's history dates back to the sixth millennium BC [27] and the third millennium BC [28]; the city was initially formed on a small group of hills around a central hill where

the Citadel still exists 50 m above the ground level. Aleppo was formed organically, first inside the fortification walls and then outside, with its urban fabric resulting in coherent urban patterns (Figure 2). The urban fabric is the typical Islamic style, including a densely built environment with few public open spaces [29]. During the last century, Aleppo's urban fabric was profoundly distorted due to the partial implementation of master plans. As in many Syrian cities, the authorities promoted the coexistence of two urban systems; the historic centers were preserved, but large demolition took place to showcase historical monuments [30]. The first master plans were implemented after 1890, causing, in 1893, the demolition of the north wall of the historic center, in order to accommodate the 14-m-wide road, surrounded by hotels, residences, and markets. Later on, architects and planners Rene Danger and Michel Écochard, in collaboration with the Commission from Aleppo Municipality, prepared new master plans for the city. The first master plan was approved in 1938 [30]. In 1925, a western-style administration was established, which signaled the initiation of modern city planning and distinguished the start of research and mapping of the city to create a basis for later urban studies. In 1931 and 1938, Aleppo's first organized master plans came to life and were influenced by the European planning standards, as expressed by the charter of Athens. Between 1950 and 1970, new master plans were published, imposing large highways over the traditional urban fabric, and those ended up destroying a part of the historic center. In 1952, specifically, the master plan schemes proposed by Andre Gutton proposed two main roads and two large highways along the east–west axis, which would serve as vehicle parking, as well as large warehouses, replacing the traditional buildings [30].



**Figure 2.** Aleppo's evolution. Areti Kotsoni, "Urban regeneration of the historical center of Aleppo in Syria," Diploma Thesis, School of Architecture and Engineering, Technical University of Crete, Chania, Greece, 2019, <https://doi.org/10.26233/heallink.tuc.82176> (accessed on 24 January 2023).

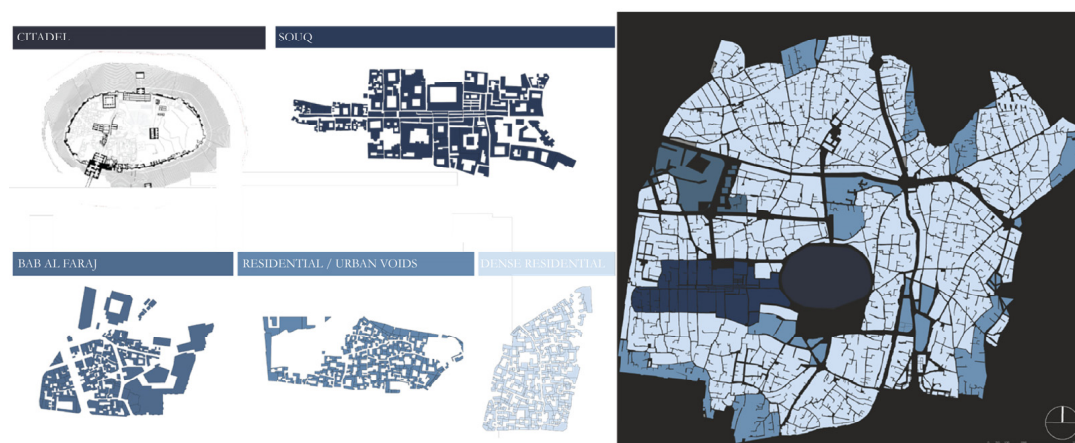
Between 1960 and 1974, a new Master Plan of Aleppo was presented by C. Benchoya and the Technical Office of Aleppo Municipality. This Master Plan was more sensitive to preserving Aleppo's historic fabric and finding ways to limit modern construction in the historic center [30,31]. This Master Plan was an attempted remedy the street network impositions made by the Gutton Master Plan, the partial implementation of which destroyed almost 20% of the historic urban fabric [32]. C. Benchoya's Master Plan separated the Intramuros city into historical districts (48 hectares including about 150 monuments); old districts without historical character (77 hectares), and insalubrious districts (27 hectares) [30]. The master plan suggested specific conservation, renovation, or construction regulations for the different zones. This project did not establish streets cutting through the historical districts [30].

In 1979, public and private parties in Aleppo acted against this Master Plan until the Ministry of Culture stopped its implementation [33]. Following this event, Dr. Stefano Bianca, a UNESCO expert, conducted lengthy research on the historic city, which led to a report in 1983 that proved Aleppo's cultural value. In 1986, the historic city was registered as a national monument on UNESCO's World Heritage List, meeting criteria 3 and 5: it includes unique testimonies to cultural traditions or civilizations and outstanding examples that illustrate a significant historical stage [34]. During the Rehabilitation project

of Aleppo's historic center, which was completed in 1998, a buffer zone was created around the historic core, aiming to isolate it from its surrounding areas, in order to preserve and protect it. This plan was a reaction to the implementation of several destructive master plans [35]. This buffer zone failed in achieving its primary goal and it failed to form a transitional area or natural expansion of the historical city. In contrast, these areas were used for parking lots, garages, and storage of building materials [36].

### Analysis of the Urban Space and Building Structures

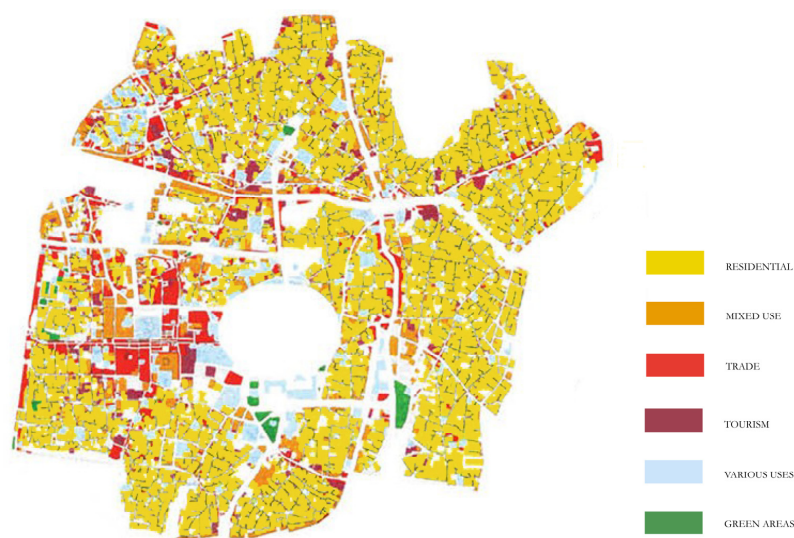
The historic center of Aleppo contains numerous types of buildings, many of which possess significant architectural value. The majority of these structures are residences constructed in traditional Islamic courtyard house styles. The area is comprised of various land uses, including religious sites, a central market known as a Souk, Hammams (bathhouses), Khans (caravanserais), administrative buildings, and museums [37]. Aleppo's traditional urban layout can be divided into five primary categories (Figure 3). The Citadel is the first category, while the second encompasses the Al-Madina Souk typology. The third and fourth categories comprise densely structured residential building blocks interspersed with open spaces. The fifth category pertains to the Bab Al-Faraj neighborhood, which features a blend of historic and modern buildings [38].



**Figure 3.** Categorization of the different building typologies in Aleppo's historic urban fabric. From dark blue to lighter, the categorization is Aleppo's Citadel, Souq, Bab al Faraj, residential areas with urban voids, and denser residential areas. Aleppo's evolution. Areti Kotsoni, "Urban regeneration of the historical center of Aleppo in Syria," Diploma Thesis, School of Architecture and Engineering, Technical University of Crete, Chania, Greece, 2019, <https://doi.org/10.26233/heallink.tuc.82176> (accessed on 24 January 2023).

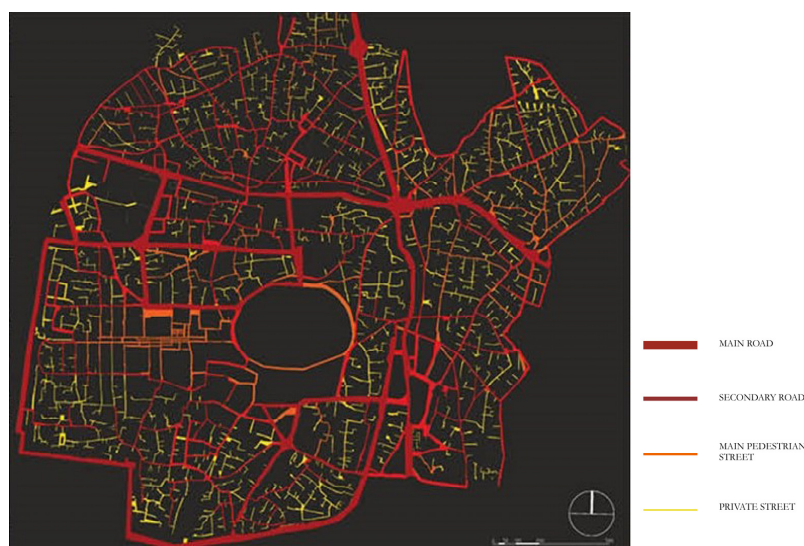
After the GIS analysis of 2004 data, it was revealed that residential land uses comprise around 60% of the land in Aleppo, with the remaining land being utilized for commercial, administrative, public, and touristic purposes [26] (Figure 4). In 2005, urban planners proposed a plan to manage the city's growing tourism industry by relocating all tourism-related land uses away from the Citadel and restricting historic neighborhoods to residential use only. The proposal also suggested moving activities such as goldsmithing and soap making that historically occurred around the historic center [39]. However, these plans were never implemented, allowing the socio-economic environment of Aleppo's historic center to remain essentially stable.





**Figure 4.** Existing land uses before the war. Aleppo’s evolution. Areti Kotsoni, “Urban regeneration of the historical center of Aleppo in Syria,” Diploma Thesis, School of Architecture and Engineering, Technical University of Crete, Chania, Greece, 2019, <https://doi.org/10.26233/heallink.tuc.82176> (accessed on 24 January 2023).

The primary mode of transportation within Aleppo’s historic city is automobiles (Figure 5). The current rail network is developed in the surrounding areas but does not extend to the historic core. Residential areas typically consist of a main street, a secondary street, and several smaller pedestrian walkways. The main road network was created in 1954 with the partial implementation of Gutton’s master plan, which involved demolishing buildings to create a 20 m-wide boulevard. The secondary road network is narrower, ranging from 8 to 12 m wide, and is intended for lower traffic volumes. The narrow alleys are categorized into two types: a primary pedestrian street and private cul-de-sacs leading to the courtyards of homes.



**Figure 5.** Existing transportation networks before the war. Aleppo’s evolution. Areti Kotsoni, “Urban regeneration of the historical center of Aleppo in Syria,” Diploma Thesis, School of Architecture and Engineering, Technical University of Crete, Chania, Greece, 2019, <https://doi.org/10.26233/heallink.tuc.82176> (accessed on 24 January 2023). Aleppo Today: Opportunities and Threats. The Syrian Civil War and Its Consequences.

The historic center of Aleppo is lacking in green spaces [38], but there are several public areas in front of religious buildings such as mosques. An urban planning initiative in 2005 aimed to improve public infrastructure by establishing pedestrian areas within the historic center [33]. The plan placed particular emphasis on revitalizing the area around the Citadel, which has since become a popular public space and one of the largest in Syria [40].

The country's civil war has heavily impacted Aleppo. In 2011, a civil war started in Syria between the government and the opposition forces, dividing Aleppo into two zones: the west, controlled by the regime, and the east, ruled by the opposition forces [41]. Aleppo has been heavily impacted by this civil war, and the city has suffered significant damage to its infrastructure, including its urban planning. The conflict has caused population displacement, destroyed buildings and public spaces, and disrupted essential services such as water and electricity.

The war heavily affected the historic center; the narrow alleyways and adjacent buildings provided an ideal environment for the frontline of the war. In 2014, 15% of the neighborhoods were recorded to be entirely destroyed, 47% were partially damaged, and 38% were affected [24]. In parallel, most of the road networks were ruined [42]. The historic center became the most abandoned area in Aleppo, with 16.5% of the historic core being totally or partially destroyed and 84% being affected. More specifically, 121 cultural elements (houses, mosques, churches, Khans, markets, open spaces, and monuments) have been reported as damaged (totally or partially destroyed, burned, or looted). Most of the city's services and infrastructure (e.g., health and food) have been damaged. In addition, the principal economic forces in the historic center, those of tourism, trade, and services, collapsed, and the historic center stopped being a significant commercial and tourism hub [24]. However, it is estimated that the damages to cultural assets are being underreported [43]. Nearly 85% of the upper-middle-income population was forced to leave the historic center.

Although attempts have been made to reconstruct the city, it continues to encounter major obstacles with regard to urban planning and renovation. These obstacles include slow progress due to security issues, insufficient funding, and limited availability of resources and knowledge. Additionally, there is a continuing discussion on how best to approach the reconstruction of the city, with some individuals supporting a complete overhaul of the city's urban landscape and others advocating for the preservation of its historical characteristics.

Following the war in 2016, Aleppo's residents began to return to the city. It is predicted that by 2024, 100% of the population that lived there before the war will have returned. The UN Multi-Sector Analysis for Aleppo indicates that the city's population growth rate in 2023 will be 5%, which is higher than the pre-crisis growth rate of 2.8% [24]. Nonetheless, many of the returnees will be unemployed, and there will not be enough housing to accommodate them. Prior to the war, there were an estimated 11,000 houses in Aleppo, housing a total of 128,000 people, which meant that 11.57 people occupied each property. During the post-war period's initial and second phases, it may be possible to house more residents in existing buildings by increasing the number of people per property. After the war, 41.5% of the historic center's buildings were still habitable, indicating that the returned population could inhabit the city's existing buildings with an increased density of 15.6 people per parcel.

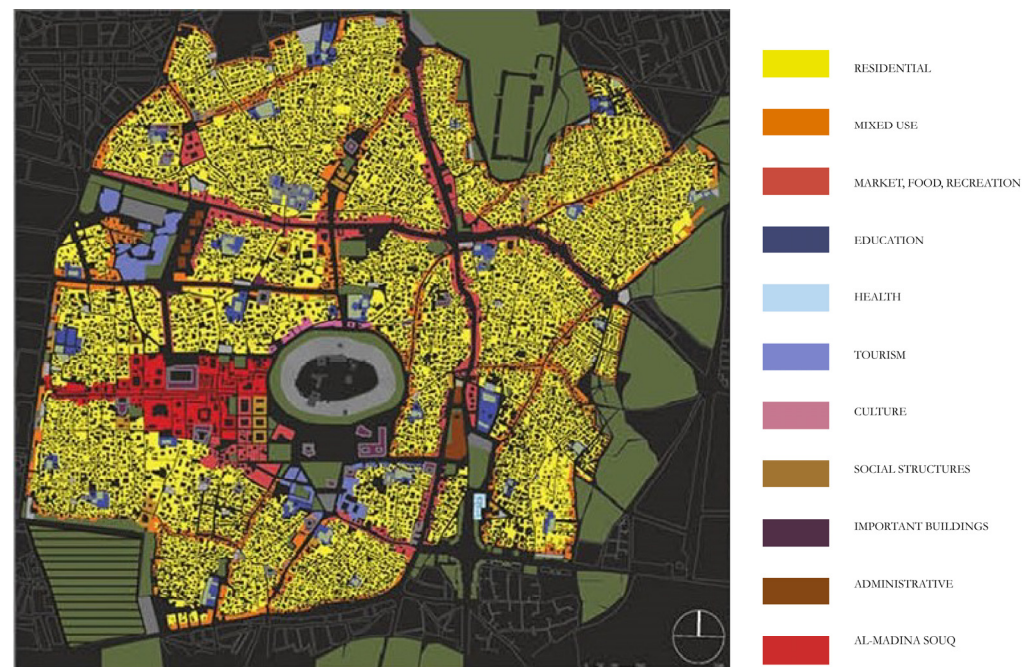
## **6. Proposing Strategies for the Revitalization of the Area in Accordance with the Principles of Historic Urban Conservation**

The aftermath of the war in Aleppo created a dire situation for both the city and its inhabitants, necessitating urgent action for the urban revitalization of the historic built environment. This paper suggests implementing conservation, restoration, and preservation methods with a focus on participatory and human-centric approaches. The primary objective is to enhance the quality of life for citizens by redefining land use, transportation systems, green spaces, and public areas. The proposal aims to rejuvenate the historic center

through small-scale interventions, diverging from previous plans prioritizing profits and the massive relocation of traditional activities.

### 6.1. Land Uses

The proposal aims to better organize the land uses in order to revive and preserve Aleppo's historical center. The role of different land uses will be dynamically adjusted to meet the city's needs and alleviate the consequences of the war. For instance, around 34% of school buildings are not functional due to damage caused by the war [4]. The land use proposal prioritizes education by identifying neighborhood-level educational hubs with the required infrastructure to serve as schools. In addition to that, and given that collective shelters are scarce, the research proposes the creation of social infrastructure (e.g., clinics, public libraries, centers for older adults, playgrounds) that will be scattered within the residential blocks, accessible to everyone on a neighborhood scale (Figure 6). The residences continue to occupy most of the land and are placed inside the building blocks to remain protected from traffic, noise, and public use.



**Figure 6.** Proposal for land uses. Aleppo's evolution. Areti Kotsoni, "Urban regeneration of the historical center of Aleppo in Syria," Diploma Thesis, School of Architecture and Engineering, Technical University of Crete, Chania, Greece, 2019, <https://doi.org/10.26233/heallink.tuc.82176> (accessed on 24 January 2023).

The new land use proposal proposes linearly placing markets and local trade, mainly around the residential blocks. In addition, a central linear trade zone on the broader streets is proposed, as well as a secondary zone on narrower streets and neighborhood levels. Traditional markets, such as Al-Madina Souk, remain in the same pre-war areas, while secondary markets and mixed-use markets are spread around the residential blocks' perimeters. Administrative services are concentrated in newly built dwellings that can occupy more square meters. Welfare and health services are placed in the same way. Finally, tourist accommodation is focused mainly around the Citadel (e.g., in buildings that, pre-war, used to have the same function) and in newly built constructions in the Bab Al-Faraj neighborhood. Compared to the proposals of the Old Aleppo Municipality and the German Agency for the Protection of Heritage (GTZ), who mapped the historic center's conditions and proposed general regeneration schemes for its different neighborhoods, we performed an extensive and detailed mapping of all the individual buildings of the



historic city. Our proposal suggests new land uses per area and identifies specific buildings as spaces of opportunity. The detailed mapping of the buildings was performed by tracing the buildings from satellite imagery taken in 2019.

### 6.2. Transportation Networks

The proposal for transportation network planning aims to improve connectivity to the new city while reducing the use of cars in the historic center (Figure 7). The plan includes a primary road network, a secondary network, a pedestrian street allowing for residents' car access, a main pedestrian street, and private streets leading to residences. A minibus network will be established to facilitate low-mobility travel, starting at the central train station and crossing the historic center, with bus stops near public buildings and leading activities. Additionally, specific major road networks will be converted to secondary to reduce car traffic within the historic center. Finally, vacant lots will be transformed into municipal and private parking and off-street parking spaces.



**Figure 7.** Proposal for transportation networks. Aleppo's evolution. Areti Kotsoni, "Urban regeneration of the historical center of Aleppo in Syria," Diploma Thesis, School of Architecture and Engineering, Technical University of Crete, Chania, Greece, 2019, <https://doi.org/10.26233/heallink.tuc.82176> (accessed on 24 January 2023).

### 6.3. Green Areas and Public Spaces

As with many historical areas, Aleppo suffers from a shortage of open green spaces. However, the new city area provides a range of green spaces, such as linear parks and public gardens. The aim is to locate unused spaces in the historic center that can be transformed into green areas and linked to those beyond the city's borders (Figure 8). The suggestion includes introducing linear green strips in some of the historic center's road networks to connect the green-deficient historic center with the new city through a green network, such as trees and flower beds. Additionally, the proposal creates a network of public squares and sidewalks in both the historic center and the larger city. A broad sidewalk has been created along the remains of the city's fortification wall, with small public squares in front of the still-maintained gates.

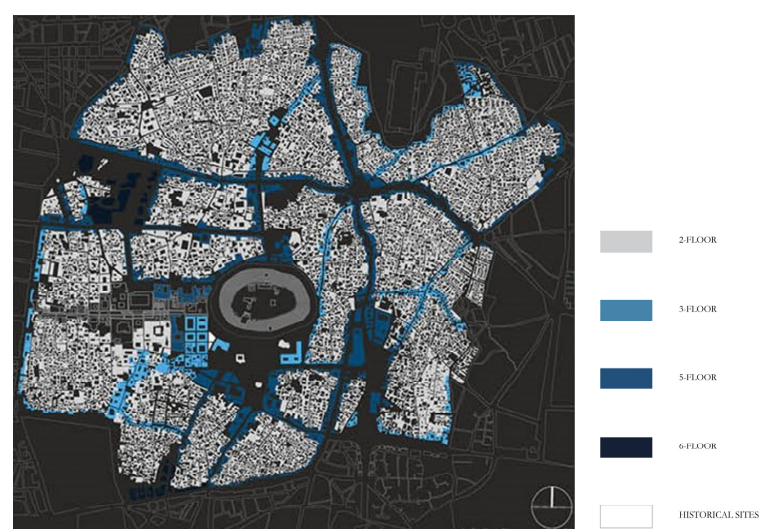




**Figure 8.** Proposal for green spaces and public squares. Aleppo's evolution. Areti Kotsoni, "Urban regeneration of the historical center of Aleppo in Syria," Diploma Thesis, School of Architecture and Engineering, Technical University of Crete, Chania, Greece, 2019, <https://doi.org/10.26233/heallink.tuc.82176> (accessed on 24 January 2023).

#### 6.4. Building Regulations and Urban Density

It is essential to uphold the current building regulations to preserve the traditional built environment. We identified four primary zones by analyzing the pre-war regulations and making a classification based on satellite imagery obtained from GIS in 2019 (Figure 9). The first zone consists of two-story residential buildings with a 75% building coverage and a 1.5 building ratio. The second zone includes three-story buildings with a 75% building coverage and a 2.25 building ratio, typically found in areas with scattered individual buildings outside of densely populated residential blocks. The third zone pertains to five-story buildings with an 80% building coverage and a 3.2 building ratio, primarily located on the outskirts of residential blocks. The fourth zone contains buildings with six or more floors, 100% building coverage, and a building ratio of 6, including newly constructed buildings in the Bab Al-Faraj neighborhood, which is not officially part of the historic center of Aleppo.



**Figure 9.** Proposal for building regulations. Aleppo's evolution. Areti Kotsoni, "Urban regeneration of the historical center of Aleppo in Syria," Diploma Thesis, School of Architecture and Engineering, Technical University of Crete, Chania, Greece, 2019, <https://doi.org/10.26233/heallink.tuc.82176> (accessed on 24 January 2023).

## 7. Discussion

After the end of the war, Aleppo's inhabitants that were forced to leave their homes eventually returned back. The returnees are aware of the difficulties they will face in the city, but they are passionate about their hometown, and they can play a huge role in its urban renewal. Therefore, it is essential that these individuals do not undergo another displacement but instead are actively involved in the revitalization efforts. Urban planners should consider the residents' needs and desires when planning the historic center's regeneration. Moreover, Aleppo's inhabitants can offer valuable insights as they lived in a highly restrictive and isolated society before the war, with specific information available on daily life in the city. Their testimonies and recollections can aid planners in understanding pre-war living conditions [12]. During the conflict, public spaces were greatly altered, with women, for instance, limiting themselves to their homes and immediate surroundings while clandestinely serving others as educators or medical providers. In our proposal, we aim to create public spaces that are accessible to all, regardless of age or gender, and to reassess the strict boundaries between public and private areas.

This paper advocates for community engagement in the regeneration of Aleppo's historic center. The proposal emphasizes the physical participation of citizens in the process, enabling them to restore their own properties or those of others. Those possessing skills such as teaching, cooking, or providing medical care can also offer their services. The pre-war period saw a culture of mutual support among Aleppo's inhabitants, which should be harnessed to drive a participatory process. Specific stakeholders with a sense of ownership towards buildings have positively impacted the area's conservation and could be included in the process. The proposal suggests reusing existing materials from damaged buildings to preserve cultural identity and minimize reconstruction costs. This approach would reduce transportation costs and minimize negative environmental impacts. In addition, using traditional materials such as stones and wood with new techniques can save the area's cultural identity and contribute to the buildings' adaptation to local climate conditions.

Another challenge discussed in this paper is the symbiosis of tourism and locals in the historic center of Aleppo. Tourism was one of the primary means of economic activity in the pre-war period, and inhabitants seemed interested in retaining it in the historic core. Tourism will remain in the historic center, but it will be concentrated in areas that will not disturb the privacy of the residents [20]. The proposal respects tradition but also intends to introduce a novel approach by incorporating some elements of contemporary city planning and adapting them to the traditions of the Middle East. The proposal attempted to smooth the dichotomy that exists today in the city: maintaining tradition by preserving the past for its intrinsic value but also developing and adapting it to changing societal values.

At present, Aleppo is still in a recovery process after the severe catastrophes of the war and the recent earthquake. Inhabitants have returned to the city, and field research and mapping have begun in order for the damages to be measured and registered. This paper tries to confront the existing situation in the city as an opportunity for the historic center's redevelopment and to resolve pre-war irregularities. For this reason, this study proposes new policies and strategies for the historic center's regeneration, considering the inhabitants, the stakeholders, UNESCO's regulations, and the cultural value of the built environment.

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