



# Evaluation of heritage character in the European zone of Kota Lama Surabaya post-revitalization through an urban design elements approach

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## ABSTRACT

**Background:** The revitalization of the European Zone represents an effort by the Surabaya city government to improve the quality of the area without erasing its historical value and identity. Previous studies have generally assessed the success of revitalization based on either the physical condition of buildings or the activities within the area, treated separately, while the relationship between urban design elements and heritage character remains rarely discussed. This study aims to analyze the heritage character of the European Zone in Kota Lama Surabaya post-revitalization through eight urban design elements: land use, building form and massing, circulation and parking, open space, pedestrian ways, activity support, signage, and preservation. **Methods:** This study employs a descriptive qualitative method using field observation, documentation, and literature review. **Findings:** The results are then synthesized with four heritage character variables: physical urban form, spatial legibility, visual character, and heritage value. The findings indicate that the heritage character of the European Zone is formed through the interrelation of mutually reinforcing urban design elements that collectively shape the area's overall heritage character. Although the revitalization has successfully improved the physical quality of the area, the scope of intervention remains limited to a few main corridors, resulting in an uneven formation of the area's character. **Conclusion:** This study demonstrates that heritage character is determined not only by the presence of historic buildings but also by the relationships among elements that shape spatial structure, visual identity, area legibility, and historical value. These findings are expected to serve as a reference for the evaluation and future planning of heritage area revitalization. **Novelty/Originality of this article:** This study introduces an integrated framework linking urban design elements and heritage character to evaluate heritage-sensitive revitalization and cultural placemaking in public spaces.

**KEYWORDS:** European Zone; heritage character; revitalization; urban design elements.

## 1. Introduction

Surabaya City is known as the City of Heroes because of its strong history of struggle in defending Indonesia's independence in the past (Aji et al., 2023). Moreover, Surabaya is also the second largest city in Indonesia and one of its oldest cities, having undergone numerous phases of development over time (Romadhonita & Elviana, 2023). Its strategic location has made the city a center of social, economic, and trade activity since the Dutch colonial era, particularly in supporting the flow of goods distribution from the archipelago to European countries (Hasyim et al., 2024). This role contributed to the formation of historic areas that bear witness to the city's development, one of which is Surabaya's Old Town, which

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developed along the banks of the Kalimas River (Febe et al., 2024; Surjono et al., 2024). This 2.27 km<sup>2</sup> area is divided into four main zones, namely the European Zone, Commercial Zone, Ampel-Malay Zone, and Chinatown Zone (Institute for transportation and development policy/ITDP Indonesia, 2024), within which lie historic elements that preserve the historical memory of past community life (Nurubiatmoko et al., 2020). Surabaya's Old Town once experienced a decline in function due to inadequate area management, which weakened the identity of the historic area (Wijaya et al., 2025; Duan et al., 2022). This condition prompted the Surabaya City Government to carry out revitalization, particularly in the European Zone, as an effort to revive the area through the redevelopment of its physical, social, and economic aspects (Danisworo & Martokusumo, 2002; Roberts & Sykes, 2000). In the context of heritage, intervention processes must be sensitive to the area's local values (Verdini & Xin, 2023; El-Deen et al., 2024), given that changes to the historic urban landscape have the potential to affect socio-cultural aspects in maintaining the area's historical character (Abdurahiman et al., 2024; Ma & Sun, 2024).

However, several physical interventions in historic areas in Indonesia have largely focused on beautification alone without considering the preservation of historic elements. Cases of public rejection due to the conspicuous repainting of buildings on Jalan Panggung, in the Ampel-Malay Zone (Mahindra & Megawati, 2022), as well as interventions in the Lasem heritage area that were considered to obscure historic elements (Dini & Kurniawan, 2024), demonstrate that revitalization efforts that disregard preservation aspects have great potential to erode an area's character. To prevent the loss of character and identity in the European Zone after revitalization, redevelopment efforts must be grounded in a theoretical basis concerning heritage character. According to United Nations Educational, Scientific and Cultural Organization (UNESCO) guidelines, heritage character is shaped not only by physical aspects but also by the integration of the built environment, spatial patterns, the interrelation of elements, and cultural values (UNESCO, 2011; Phetsuriya & Heath, 2021). This character is influenced by an area's capacity to be recognized by its users, or imageability (Lynch, 1960; Zhang et al., 2024), as well as by the emergence of genius loci, in which physical conditions are closely intertwined with the meaning and spatial experience within them (Norberg-Schulz, 1980; Bo & Abdul Rani, 2025).

From a physical perspective, heritage character cannot be separated from urban design elements, since the form of the built environment and the arrangement of physical elements contribute to shaping place identity (Mansour et al., 2023; Agradiana et al., 2026). Urban design elements establish order and spatial experience for users (Shirvani, 1985). In heritage areas, land use reflects the morphological process (Gorjian, 2025); building massing shapes visual identity (Huang et al., 2024); circulation and pedestrian pathways support spatial connectivity (Hamida & Sutiana, 2024); signage facilitates area legibility (Zhou & Ujang, 2024); open space enhances the quality of social interaction (Pattacini, 2021); activity support facilitates the use of space (Yang et al., 2024); and preservation is key to sustaining heritage character amid the area's transformation process (Lovra & Sarihan, 2024).

Table 1. Synthesis of research variables

| Literature Review           | Selected Variable                                                         | Source                                                                                                                                                                                                     | Reason for Selection                                                                                                                                                                                                                                                                                                                 |
|-----------------------------|---------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Regional Heritage Character | Physical Urban Form, Spatial Legibility, Visual Character, Heritage Value | UNESCO (2011); Phetsuriya & Heath (2021); Zhang et al. (2024)<br>Lynch (1960); UNESCO (2011); Zhang et al. (2024)<br>UNESCO (2011); Lynch (1960); Zhang et al. (2024)<br>Norberg-Schulz (1980); Bo & Abdul | Indicates that the area's heritage character is formed from physical conditions such as buildings, spatial patterns, and landmarks that have developed historically to shape the area's structure and identity.<br>Area legibility is an important aspect in forming character because it affects users' ability to remember an area |

| Literature Review     | Selected Variable                                                                                                                  | Source                                                                                                                                                                                                                                                                                                                          | Reason for Selection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                       |                                                                                                                                    | Rani (2025); UNESCO (2011); Phetsuriya & Heath (2021)                                                                                                                                                                                                                                                                           | through the distinctive arrangement of spatial elements.<br>Visual character reflects the visual quality of an area that distinguishes it from other areas through the presence of landmarks, visual relationships between elements, and the distinctive appearance of the built environment.<br>Heritage value represents the historical meaning, culture, identity, and community attachment to an area, forming the basis of a historic area's character.                                                                                                                                                              |
| Urban Design Elements | Land Use, Building Form and Massing, Circulation and Parking, Pedestrian Ways, Open Space, Activity Support, Signage, Preservation | Shirvani (1985); Gorjian (2025)<br>Shirvani (1985); Huang et al. (2024)<br>Shirvani (1985); Hamida & Sutiana (2024)<br>Shirvani (1985); Hamida & Sutiana (2024)<br>Shirvani (1985); Pattacini (2021)<br>Shirvani (1985); Yang et al. (2024a)<br>Shirvani (1985); Zhou & Ujang (2024)<br>Shirvani (1985); Lovra & Sarihan (2024) | Describes the pattern of spatial function and the area's morphological development.<br>Influences the visual character and identity of the heritage area.<br>Indicates the movement pattern and accessibility of the area.<br>Supports spatial connectivity and users' experience of the area.<br>Shapes the quality of public space and social interaction within the area.<br>Shows the relationship between activities and the utilization of the area's space.<br>Supports the area's legibility, orientation, and navigation.<br>Maintains the sustainability of heritage character and the area's historical value. |

Several previous studies have examined the Surabaya Old Town area, particularly the European Zone, from various perspectives, such as area development through a good tourism governance approach (Lestari & Tamrin, 2025), the role of genius loci as a catalyst for tourist attraction (Fajriyah & Sari, 2026), and the adaptive reuse of historic buildings (Mau et al., 2026). These studies confirm that the European Zone is an important site in the discourse on urban historical preservation. However, studies that specifically address the impact of revitalization on heritage character through an urban design elements approach remain limited. This research gap indicates that evaluating the results of post-revitalization redevelopment is highly important to ensure that interventions align with the historical identity already embedded in the area. Therefore, the research question arises: "What is the heritage character of the Surabaya Old Town European Zone following revitalization?" Accordingly, this study aims to evaluate the heritage character of the Surabaya Old Town European Zone after revitalization through an urban design elements approach. This evaluation specifically covers an analysis of the forms of area redevelopment, the condition of urban design elements after revitalization, and the contribution of these elements to the

formation of the area's heritage character. The following table presents the variables used to evaluate the heritage character of the European Zone through the urban design elements approach.

## 2. Methods

This study employs the qualitative analysis approach of Creswell & Creswell (2018) with a descriptive method, used to understand a phenomenon based on real conditions through the researcher's interpretation of the object under study. This approach was chosen because it can provide an understanding of the contribution of urban design elements in shaping an area's heritage character. The research location is focused on the European Zone of Surabaya's Old Town, selected because this area is the center of concentration of heritage buildings with a relatively well-preserved colonial character. Research data were obtained through primary and secondary data. Primary data were obtained through observation and documentation to gather information on the condition of the area and the various forms of redevelopment carried out during the revitalization process.

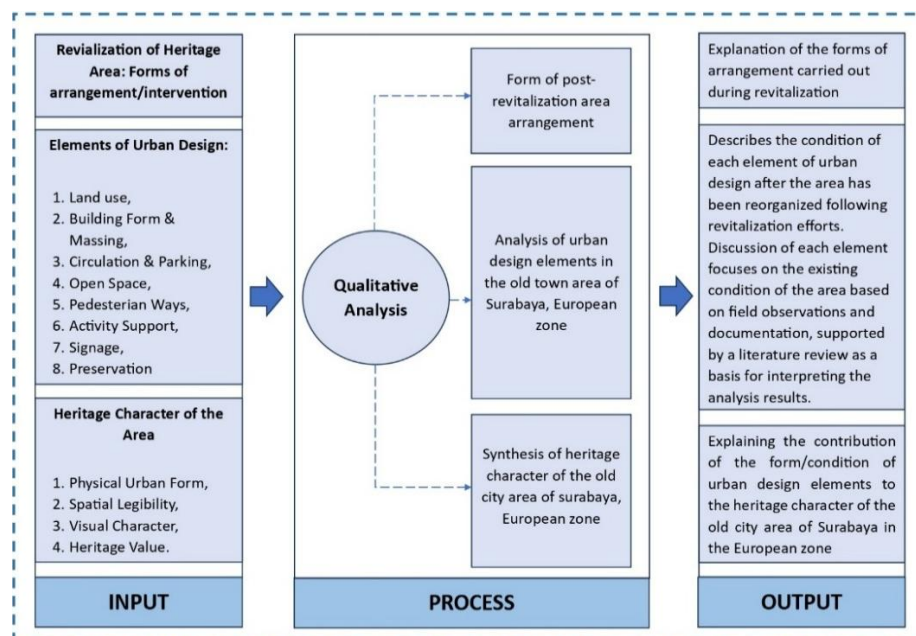


Fig. 1. Analysis framework

Secondary data were obtained from planning documents, revitalization reports, government regulations, area maps, and various scientific literature related to heritage character, urban design elements, and the revitalization of historic areas. The data were then analyzed in stages, beginning with an analysis of the forms of redevelopment resulting from revitalization, followed by an analysis of the condition of the urban design elements, and concluding with an evaluation of each element's contribution to shaping the area's heritage character. This series of analytical stages is summarized in the research analysis framework presented in Figure 1.

## 3. Results and Discussion

### 3.1 Forms of area redevelopment after revitalization

Based on the results of field observation and documentation, the revitalization efforts in the Surabaya Old Town European Zone encompass various forms of redevelopment, including the improvement of pedestrian pathways along Jalan Rajawali, utility

redevelopment through the relocation of electrical cables beneath the pedestrian pathway, the redevelopment of public open spaces such as Taman Sejarah (Historical Park) and the Internatio Outdoor Plaza, the addition of street lighting, and the repair and reuse of a number of historic buildings. In addition, the revitalization was accompanied by the addition of various supporting elements for the area, such as a statue of General A.W.S. Mallaby's car as a historical marker, information boards on heritage buildings, directional signboards, and the naming of various public spaces and corridors within the area. These various forms of redevelopment were carried out to improve the environmental quality of the area while strengthening the function of the European Zone as a heritage tourism destination. These various forms of redevelopment indicate that the revitalization of the Surabaya Old Town European Zone did not only focus on improving the area's infrastructure quality but also encompassed the redevelopment of elements that support the identity of the historic area. These forms of redevelopment were subsequently analyzed based on urban design elements to determine their contribution to shaping the area's heritage character after revitalization.

### 3.2 Urban design elements in the European Zone

The analysis was conducted using the eight urban design elements proposed by Shirvani (1985), namely land use, building form and massing, circulation and parking, open space, pedestrian ways, activity support, signage, and preservation. The discussion of each element focuses on the existing condition of the area based on the results of field observation and documentation, supported by a literature review as the basis for interpreting the analysis results.

#### 3.2.1 Land use

Land use is the first element observed because it shows how the area's functions have been utilized after revitalization. Based on the 2021 Surabaya City Detailed Spatial Plan (RDTR) land-use map, confirmed through field observation, no significant change was found in land allocation within the European Zone; the area is still dominated by trade and services functions, supported by public spaces, heritage buildings, and residential areas located behind the main corridor.

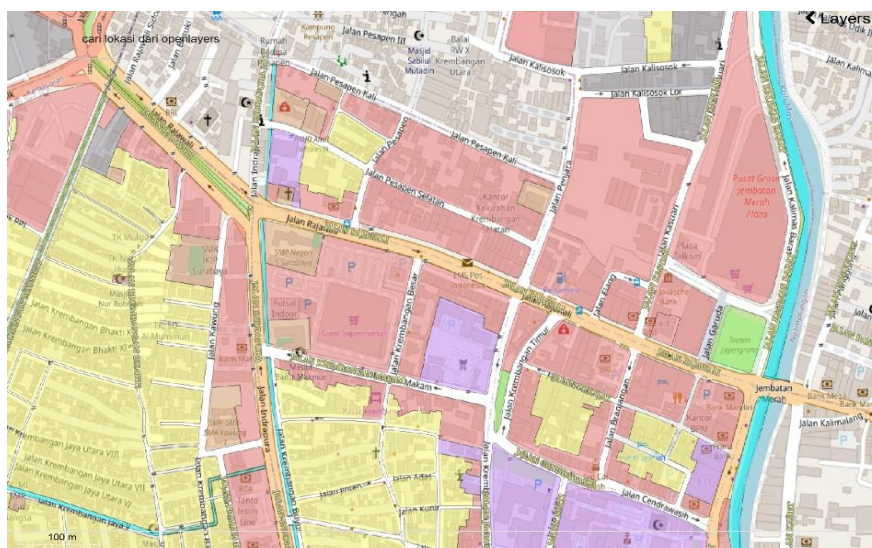


Fig. 2. Land-use map of the European Zone in Surabaya Old Town  
(Dinas Perumahan Rakyat dan Kawasan Permukiman serta Pertanahan/DPRKPP Surabaya, 2021)

The observation results show that a number of historic buildings have been repurposed as restaurants, cafés, galleries, museums, and other commercial spaces through an adaptive

reuse approach. These findings indicate that revitalization is directed more toward optimizing spatial use through building adaptive reuse, without substantially altering the pre-existing land-use structure. According to Shirvani (1985), land use can determine both the activity patterns and character of an area. This finding is also in line with Gorjian et al. (2025), who explain that the sustainability of a heritage area is influenced by the ability of its functions to continue developing without losing their historical value.



Fig. 3. (a) Bank Jatim Office; (b) Zerogram Café; (c) Residents' Settlement; (d) De Javasche Bank Museum

### 3.2.2 Building form and massing

The visual character of the Surabaya Old Town European Zone is still dominated by rows of colonial buildings scattered along the Jalan Rajawali corridor and its surrounding streets. Based on the distribution map of heritage buildings and the results of field observation, most historic buildings retain their original form, mass proportion, building height, and relatively uniform façade. Revitalization has been directed more toward improving the physical condition of the buildings and their surrounding environment without altering their main visual character. In addition, several buildings have been repurposed as cafés, restaurants, museums, and other commercial spaces, so that historic buildings continue to function as part of the area's activities while preserving the visual image of the Surabaya Old Town European Zone corridor.

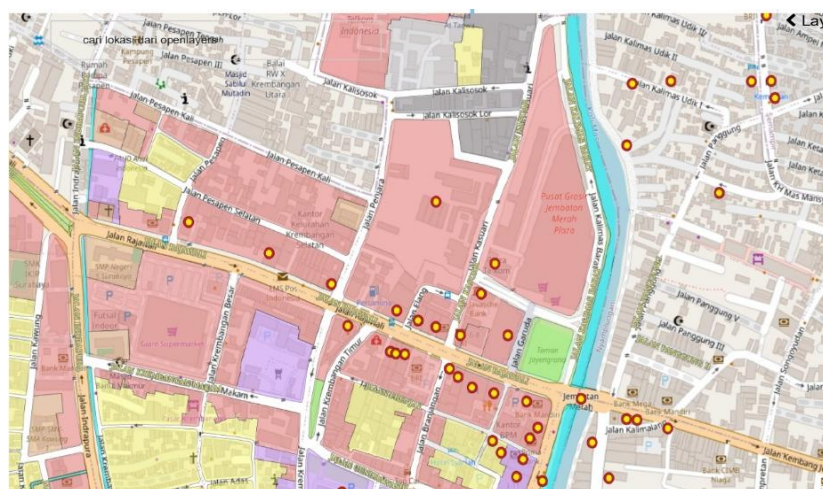


Fig. 4. Distribution points of heritage buildings in the Surabaya Old Town European Zone area (DPRKPP Surabaya, 2021)

Shirvani (1985) explains that building form and massing can affect an area's visual quality through building form, proportion, scale, and the interrelation between buildings in

shaping urban space. This condition is evident in the European Zone, where the continuity between building forms and masses is considered still capable of creating a visual identity for the area after revitalization. This finding is in line with Huang et al. (2024), who emphasize that heritage area character is formed through the interrelation of physical elements within a historic urban landscape, not merely from individual historic buildings. In addition, the reuse of several buildings for commercial functions also demonstrates the application of the adaptive reuse concept as described by Mau et al. (2026).



Fig. 5. (a) Jl. Rajawali Corridor; (b) Arcadia Hotel; (c) Cerutu Building; (d) Singa Building

### 3.2.3 Circulation and parking

The circulation system in the Surabaya Old Town European Zone still retains the historic street network pattern formed since the colonial era. Based on the road network map and field observation results, the main corridor, such as Jalan Rajawali, remains the primary movement route, while several surrounding road segments function as supporting access to the area. Revitalization did not alter the structure of the road network but instead focused on redeveloping the circulation space through the widening of pedestrian pathways, the reorganization of parking areas, and the reduction of visual obstructions along the road corridor. This redevelopment created a more orderly street space without eliminating the area's circulation function as a center of urban activity.



Fig. 6. (a) Jalan Rajawali Road Network; (b) Jembatan Merah Road Network; (c) Kasuari Terminal Parking; (d) Journey Management Plan Parking

According to Shirvani (1985), the circulation system is an important element that governs the relationship between vehicles, pedestrians, and area activities, thereby affecting the comfort and legibility of urban space. In the European Zone, the redevelopment of circulation after revitalization has been able to improve movement quality without altering the historic road network pattern previously formed. This condition aligns with Hamida and

Sutiana, who explain that a well-organized circulation system can improve area accessibility while supporting the function and quality of urban space.

### 3.2.4 Open space

Open space in the Surabaya Old Town European Zone has experienced improved quality through the redevelopment of Taman Sejarah (Historical Park) and the Internatio Outdoor Plaza as the area's main public spaces. Based on the open-space map and field observation results, both spaces are now used as gathering and resting places that support various tourism and cultural activities. The redevelopment is also equipped with seating, vegetation, lighting, and open space that provide comfort for visitors. This condition shows that open space functions not merely as a complementary element of the area but also as a public space capable of accommodating community activities within a historic environment.



Fig. 7. (a) Internatio Outdoor Plaza; (b) Taman Sejarah (Historical Park); (c) Children's Playground; (d) Basketball Court

Shirvani (1985) explains that open space is an important element in shaping the quality of urban space because it serves as a venue for social activity while strengthening the relationships between urban elements. This condition is evident in the European Zone, where open spaces are directly connected to the main corridor and the surrounding historic buildings, creating a more active and accessible public space. This finding is consistent with Pattacini (2021), who states that the quality of open space is influenced by the integration of function, form, and spatial relationships in shaping the structure of the urban landscape.

### 3.2.5 Pedestrian ways

Pedestrian pathways in the Surabaya Old Town European Zone have experienced improved quality through the redevelopment of pedestrian corridors along Jalan Rajawali and several surrounding road segments. Based on field observation results, the pedestrian pathways have been widened and equipped with new paving, benches, vegetation, street lighting, bollards, guiding blocks, and other supporting facilities. This redevelopment has created a more comfortable, safe, and accessible walking space for visitors. In addition to supporting pedestrian mobility, the presence of continuously connected pedestrian pathways also improves spatial legibility and facilitates movement between activity points within the area.

According to Shirvani (1985), pedestrian pathways are an important element in urban design that function to support pedestrian mobility while improving the quality of public space. The condition in the European Zone shows that the redevelopment of pedestrian pathways has been able to create a better relationship between street space, buildings, and various activities within the area. This finding is in line with Hamida and Sutiana, who explain that pedestrian pathways integrated with the circulation system play a role in improving accessibility, connectivity, and the quality of the urban environment. This

condition shows that the redevelopment of pedestrian pathways after revitalization has been able to improve the function and comfort of space for pedestrians.



Fig. 8. (a) Jl. Rajawali Pedestrian Pathway; (b) Jl. Rajawali Pedestrian Pathway; (c) Jl. Mliwis Pedestrian Pathway; (d) Jl. Glatik Pedestrian Pathway

### 3.2.6 Activity support

The Surabaya Old Town European Zone shows a diversity of activities supported by various area functions after revitalization. Based on field observation results, the Jalan Rajawali corridor and the surrounding public spaces are utilized for tourism, photography, culinary, and various community activities. In addition, the reuse of a number of historic buildings as museums, restaurants, cafés, and creative spaces also brings variation to activities within the area. This condition indicates that the spaces in the European Zone are utilized by various groups of users with diverse activities throughout the area.

According to Shirvani (1985), activity support is an element that functions to sustain the life of an area by providing activities capable of animating urban space. The condition in the European Zone shows that the presence of commercial, tourism, and cultural functions complement one another, creating activities that take place throughout the area. This finding is in line with Yang et al. (2024), who explain that the diversity of activities and supporting functions plays an important role in improving the vitality of urban areas. Thus, revitalization in the European Zone not only improves the physical quality of the area but also encourages the development of activities that utilize public spaces more optimally.



Fig. 9. (a) Photography activity; (b) Recreational activity; (c) Children's Play activity; (d) Culinary activity

### 3.2.7 Signage

The redevelopment of signage is one of the elements that supports the legibility of the area following the revitalization of the Surabaya Old Town European Zone. Based on field observation results, the area has been equipped with various types of markers, such as

information boards on heritage buildings, directional signboards, the naming of corridors and public spaces, as well as an interpretive element in the form of a statue of General A.W.S. Mallaby's car. The presence of these various markers makes it easier for visitors to recognize locations, understand the historical value of buildings, and obtain information about the area while engaging in activities within the European Zone.



Fig. 10. (a) Statue of General A.W.S. Mallaby's Car; (b) Interactive Map; (c) Public Space Naming; (d) Directional Signage

According to Shirvani (1985), signage functions to improve the legibility of an area by providing information and orientation for space users. The condition in the European Zone shows that various markers have been placed at strategic locations, making it easier for visitors to understand the area's structure and the function of each space. This finding is in line with Zhou & Ujang (2024), who explain that an integrated signage system can improve spatial orientation while supporting the quality of users' experience within urban areas. This condition shows that the redevelopment of signage in the European Zone has better supported the area's information and navigation functions.

### 3.2.8 Preservation

Efforts to preserve historic buildings in the Surabaya Old Town European Zone remain an important part of the area's revitalization implementation. Based on field observation results, most heritage buildings still retain their architectural form, façade, ornaments, and other distinctive colonial visual elements. In addition to physical repairs to the buildings' condition, several buildings have also been reused as museums, restaurants, cafés, or other commercial functions without altering the buildings' main character. This condition shows that the preservation of the area is carried out not only through the physical maintenance of buildings but also through their reuse to keep them functioning and in use.



Fig. 11. Preservation of Old Buildings: (a) Teras Kota Lama; (b) Fifteen Café; (c) Zerogram Café

According to Shirvani (1985), preservation is an effort to maintain important elements of an area that hold historical value through the protection of both their physical condition

and visual character. This condition is evident in the European Zone, where most historic buildings are maintained through repairs that adapt to the area's current needs. This finding is in line with Lovra & Sarihan (2024), who explain that the preservation of historic areas needs to maintain a balance between building protection and the sustainability of the area's function. In addition, Mau et al. (2026) add that the application of adaptive reuse allows historic buildings to remain in use without losing their architectural value.

### *3.3 Synthesis of the area's heritage character*

The results of the analysis of the eight urban design elements were subsequently synthesized to understand the heritage character of the Surabaya Old Town European Zone after revitalization. The synthesis was carried out by linking the findings on each urban design element to the four heritage character variables obtained from the literature review, namely physical urban form, spatial legibility, visual character, and heritage value. This approach was used to examine the interrelation among urban design elements in shaping the area's overall character. Physical urban form is the first variable examined to read the heritage character of the European Zone after revitalization. Based on the analysis results, this variable is supported by the urban design elements of land use, building form and massing, open space, and preservation. Huang et al. (2024) explain that the physical character of a heritage area is reflected through the continuity of building form, spatial structure, and the relationships among physical elements. In the European Zone, the form and mass of colonial buildings still dominate the main corridor, while land use continues to maintain the trade and services functions developed through an adaptive reuse approach. Preservation efforts for heritage buildings and the redevelopment of public open spaces further strengthen the relationship between buildings and open space as a unified area structure. This condition shows that physical character can be formed through the continuity of spatial structure, area function, and historic elements that mutually support one another.

Spatial legibility indicates the extent to which an area's spatial structure can be understood by its users. According to Lynch (1960), area legibility is influenced by the clarity of the elements that form space, facilitating orientation and movement. This variable is supported by the elements of circulation and parking, pedestrian ways, and signage, as well as open space. Revitalization maintained the road network pattern while improving the quality of pedestrian pathways, making pedestrian movement more comfortable. The addition of information boards, directional signage, and the naming of public spaces helps visitors recognize locations and understand the area's structure more easily, while open spaces such as Taman Sejarah and the Internatio Outdoor Plaza function as transitional spaces as well as meeting points that clarify orientation within the area. This condition shows that the spatial legibility of the European Zone is formed through the relationship between the circulation system, pedestrian pathways, open space, and the area's information system. Visual character describes the area's visual identity, formed through the integration of various physical elements. According to Zhou & Ujang (2024), the visual character of a heritage area is shaped not only by historic buildings but also by supporting elements that strengthen the area's overall identity. This variable is supported by the elements of building form and massing, open space, and signage. The presence of colonial buildings that still retain their original form and façade continues to dominate the area's corridor. This condition is reinforced by the redevelopment of public open spaces, which provides sightlines toward historic buildings and creates a more comfortable visual experience for visitors. In addition, the presence of building information boards, directional signage, and public-space naming further strengthens the area's visual identity without diminishing its existing historical character. This condition shows that the visual character of the European Zone is formed through the integration of historic buildings, open space, and the area's information system.

Table 2. Relationship between urban design elements and heritage character

| Design element          | Heritage character variable<br>(Physical urban form) | Heritage character variable<br>(Spatial legibility) | Heritage character variable<br>(Visual character) | Heritage character variable<br>(Heritage value) |
|-------------------------|------------------------------------------------------|-----------------------------------------------------|---------------------------------------------------|-------------------------------------------------|
| Land use                | ✓                                                    |                                                     |                                                   | ✓                                               |
| Building form & massing | ✓                                                    |                                                     | ✓                                                 | ✓                                               |
| Circulation & parking   |                                                      | ✓                                                   |                                                   |                                                 |
| Open space              | ✓                                                    | ✓                                                   | ✓                                                 |                                                 |
| Pedestrian ways         |                                                      | ✓                                                   |                                                   |                                                 |
| Activity support        |                                                      |                                                     |                                                   | ✓                                               |
| Signage                 |                                                      | ✓                                                   | ✓                                                 |                                                 |
| Preservation            | ✓                                                    |                                                     |                                                   | ✓                                               |

Heritage value provides the historical meaning and identity of the area, which can still be felt through the continuity of both physical elements and the activities that develop within it. According to Lovra & Sarihan (2024), heritage value depends not only on the preservation of historic buildings but also on the area's ability to maintain its historical meaning through use that remains relevant to its needs. This variable is supported by the elements of land use, building form and massing, activity support, and preservation. Preservation efforts on heritage buildings are carried out to maintain the colonial architectural form as a representation of the area's history, while the reuse of buildings through an adaptive reuse approach allows them to continue functioning without losing their original character. The development of tourism, culinary, and public activities in the area also helps revive its social function, so that its historical value can continue to be recognized and utilized by the community. This condition shows that the heritage value of the European Zone is formed through the integration of building preservation, the continuity of area function, and activities that maintain the community's connection with the area's history. Several elements contribute to more than one variable, indicating that the area's heritage character results from the interrelation among urban design elements rather than being influenced by a single element alone.

The relationship between each urban design element and the heritage character variables can be synthesized as shown in Table 2. Overall, the synthesis results show that the heritage character of the Surabaya Old Town European Zone is formed through the interrelation of various urban design elements that mutually support one another. Building form and massing and open space are the elements most consistently involved in shaping the area's character, while land use, circulation and parking, pedestrian ways, activity support, signage, and preservation play a role in strengthening spatial quality and visual identity, enhancing the visitor experience, and adding historical value to the area. The relationship among these elements shows that the area's heritage character is formed as a unified whole that complements itself.

#### 4. Conclusions

This study shows that the heritage character of the Surabaya Old Town European Zone after revitalization is formed through the interrelation of various urban design elements that mutually support one another. The eight urban design elements demonstrate that revitalization efforts do not only produce changes in the area's physical condition but also shape heritage character through four main variables: physical urban form, spatial legibility, visual character, and heritage value. Thus, the area's heritage character is determined not only by the presence of historic buildings but also by the relationships between area function, circulation systems, open space, signage, activities, and preservation

efforts that together shape the overall spatial experience. The main contribution of this study lies in the development of an analytical framework that links urban design elements with heritage character variables as an approach to understanding heritage area character following revitalization efforts. Unlike previous studies, which generally discuss physical aspects, building conservation, or area activities separately, this study shows that heritage character can be understood through the relationships among urban design elements working as a unified whole. This framework is expected to serve as a reference for both research and planning practice in evaluating the outcomes of heritage area revitalization in the future.

The results of this study also show that the revitalization of the Surabaya Old Town European Zone has had a positive impact on the quality of the area's spaces; however, the scope of redevelopment remains limited to several main corridors, particularly within the European Zone. This condition has resulted in the physical quality and character of the area not yet being evenly formed across the entire Surabaya Old Town. Therefore, future revitalization efforts need to be carried out in a more integrated manner by expanding the scope of redevelopment while maintaining the interrelation between the preservation of historic buildings, area function, open space, and community activities, so that the area's heritage character can be more fully formed across the entire Surabaya Old Town area. This study still has limitations, as it focuses only on the European Zone and examines heritage character from the physical aspects of the area based on field observation and literature review. The perceptions of the community, tourists, and stakeholders have not been included in the analysis, so they cannot yet provide a more comprehensive picture of heritage character. Therefore, future research could expand the scope of the study area to cover the entire Surabaya Old Town or conduct comparative studies on other heritage areas, as well as integrate quantitative approaches and user perceptions to obtain a more comprehensive understanding of heritage character after revitalization.

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### **Author Contribution**

The authors were solely responsible for the conceptualization, methodology, data collection, data analysis, interpretation of results, drafting of the manuscript, critical revision of the content, and approval of the final version of the manuscript.

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The authors declare no conflict of interest.

## Declaration of Generative AI Use

During the preparation of this work, the authors used Grammarly to assist in improving grammar, clarity, and academic tone of the manuscript. After using this tool, the authors reviewed and edited the content as needed and took full responsibility for the content of the publication.

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