

Physical Environment Transformation: The Rebuilding of a Neighborhood

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Araştırma makalesi

Abstract

Over time, changing needs have been reflected in the physical conditions of spaces, leading to small or large-scale transformations. The physical reflections of environmental changes have been the subject of various studies. This research examines the impact of the reconstruction of urban spaces on physical environments. Through a case study, the historical and contemporary physical changes are analyzed in depth using case study methodology and thematic comparative analysis. The aim is to uncover how the area once known as the Merbank neighborhood in Zincirlikuyu, Istanbul, has transformed physically from past to present and how these changes have impacted spatial interactions. The study reveals how urban planning and design shape physical environments. The findings obtained through thematic comparative analysis highlight the importance and the lack of community-centered approaches in urban planning and design. The reactive results of this research will guide future urban transformation projects.

Keywords: Architectural design, architecture, physical environment, rebuilding

Özet

Zamanla değişen ihtiyaçlar mekanların fiziksel koşullarına yansımış ve küçük veya büyük ölçekli dönüşümlere yol açmıştır. Çevresel değişimlerin fiziksel yansımaları çeşitli çalışmaların konusu olmuştur. Bu araştırma, kentsel mekanların yeniden inşasının fiziksel ortamlar üzerindeki etkisini incelemektedir. Bir vaka çalışması aracılığıyla, tarihsel ve çağdaş fiziksel değişimler vaka çalışması metodolojisi ve tematik karşılaştırmalı analiz kullanılarak derinlemesine analiz edilmektedir. Amaç, İstanbul Zincirlikuyu'da bir zamanlar Merbank mahallesi olarak bilinen bölgenin geçmişten bugüne fiziksel olarak nasıl dönüştüğünü ve bu değişimlerin mekansal etkileşimleri nasıl etkilediğini ortaya çıkarmaktır. Çalışma, kentsel planlama ve tasarımın fiziksel ortamları nasıl şekillendirdiğini ortaya koymaktadır. Tematik karşılaştırmalı analiz yoluyla elde edilen bulgular, kentsel planlama ve tasarımda toplum merkezli yaklaşımların önemini ve eksikliğini vurgulamaktadır. Bu araştırmanın reaktif sonuçları gelecekteki kentsel dönüşüm projelerine rehberlik edecektir.

Anahtar Kelimeler: Mimari tasarım, mimarlık, fiziksel çevre, yeniden inşa

Doi:

1. INTRODUCTION

In contemporary times, physical spaces undergo significant transformations due to migration, aging, evolving needs, and economic demands (Nazmeeva, 2021; Petersen & Nielsen, 2021). thereby fostering substantial changes in physical environments through restructuring. Changing also impacts the interaction between built environments and their users.

The growth from small urban parcels to large-scale developments, such as building blocks or larger areas, has significantly changed the relationship between urban and individual structures, both in the past and present. Neighbourhooding developments are much more than just an architectural typology; they are physical environments that must be analyzed within the context of urban phenomena. According to Sonne (2009) when planning residential areas, it is crucial to prioritize the creation of high-quality urban spaces and to emphasize the concept of urbanity as a key criterion for enhancing urban life.

As an opportunity regional scale transformations can potentially address societal issues, enhance public experiences, and contribute to sustainable futures. However, when influenced

by poor urban renewal policies, the transformation of physical spaces can indeed disrupt the social environment (Maginn et al., 2018). This disruption may stem from various factors such as rapid population growth, technological innovations, and socio-economic segregation of residential areas. Ultimately, changes in the physical environment reflect and shape cultural values and socio-political perspectives, emphasizing the complex relationship between physical spaces and the social fabric of communities (Weder, 2018). Existing research underscores the crucial role of public space design, such as green areas, squares, and parks, in facilitating social encounters and diverse interactions (Mezentsev et al., 2019; Sulyk, 2023).

According to Akalın (2016), urbanization in Turkey has been plagued by issues due to past erroneous policies and practices. Uncontrolled population growth continues to be one of the most pressing challenges of urbanization. Inadequate infrastructure and urban areas that fail to meet the increasing demands are host to numerous social, economic, political, and physical problems. Each of these problems in urban areas could be a subject of research. The physical manifestations of these issues, however, form the core problem of this study.

This study presents reactive research on how urban design and architectural changes can shape social dynamics. This study aims to highlight the influence of physical triggers on the shaping of modern spatial. The study investigates the effects of reconfiguring neighborhood spaces on the physical environment, aiming to identify both the positive and negative impacts on dynamics. Furthermore, it seeks to develop recommendations to understand these effects and guide future urban and architectural projects. Additionally, this study introduces and analyzes the physical changes of the Merbank neighborhood in Zincirlikuyu, Istanbul, formerly known as Merbank, comparing its before-and-after conditions.

2. LITERATURE REVIEW

When examining the evolution of housing production from the past to the present, it is evident that policies, strategies, and supply have driven this evolution. Initially, housing production was directed by responses to human needs and welfare, but in metropolitan areas worldwide, it has shifted towards capitalization, profitability, and speculation (Tavares, 2023). The historical progression toward modern housing forms shows a transition to various housing types influenced by land supply, labor, and capital in developing countries (Shirwani et al., 2019). The Industrial Revolution led to suburban expansion, reduced household sizes, and the emergence of high-rise apartments, diversifying housing models (Agunbiade et al., 2013). Miles and Sefton (2017) emphasize that understanding dynamics such as housing costs, land supply, and population growth is crucial for shaping future housing policies and addressing needs.

The development of housing production over time has brought changes to existing areas and building stock. Physical transformations in residential areas can be attributed to various factors, including economic conditions, urbanization, legal changes, and cultural influences. The historical context of production has played a significant role in shaping architectural expressions and settlement planning ideals in housing neighborhoods (Das et al., 2020). Rapid urbanization and economic development have led to urban renewal projects emerging as key tools for reshaping residential areas (Uzun, 2019). Additionally, evolving economic conditions and societal needs have influenced functional and spatial changes in multi-apartment buildings, highlighting the importance of adapting existing housing areas to meet new generations' requirements (Sylejmani, 2020). Furthermore, aging old residential areas with outdated construction standards and inadequate facilities have necessitated transformations to meet modern society's needs and ensure residents' welfare (Yamei & Chaomin, 2023).

Physical transformations in existing residential areas have led to various outcomes. These transformations must be examined and interpreted on a case-by-case basis. However, in general,

they can play a crucial role in shaping residential awareness, improving community vitality, satisfaction, and attachment to housing, and strengthening residents' identities (Das et al., 2020). Additionally, the transformation of residential areas can result in the development of housing, commercial networks, and public institutions, contributing to functional diversification (Antonenko, 2022). Examined real-world examples show that these transformations have both positive and negative impacts. While aiming to improve safety and functionality, they often result in increased infrastructure load, higher population densities, and reduced open spaces, affecting residents' livability and welfare (Şenol Balaban, 2019). Furthermore, the morphological transformation process can reduce open spaces, impacting the natural environment and potentially worsening physical and mental health by hindering residents' interactions with these spaces (Muianga et al., 2022). Moreover, although reconstructing old residential areas is necessary, it presents challenges due to unique development contexts, social situations, and cultural characteristics, requiring comprehensive coordination from various aspects (Yamei & Chaomin, 2023). On the other hand, Osmond (2009) examines the impact of urban forms and spatial arrangements on sustainable urbanization. The research evaluates how different urban morphologies contribute to environmental, social, and economic sustainability and proposes specific strategies to enhance sustainability in urban planning and design.

Urban fragments have garnered significant attention in the literature, particularly within the fields of urban studies and planning. The term refers to the physical and social fragmentation or division of urban spaces. These fragments can manifest in various ways, including physical disconnection due to infrastructural barriers, social and economic disparities between different areas, and cultural divisions within urban environments. (Choi & Yang, 2018) Fundamentally, the concept of "urban fragments" underscores the complex, often fragmented nature of cities, where different areas can experience vastly different social, economic, and physical conditions. This concept is particularly useful for analyzing urban resilience, spatial justice, and the impacts of urban planning policies (Clary et al., 2020). For instance, the study of urban morphology, which examines the physical layout and structure of cities, often addresses how these fragments arise due to historical development patterns, socio-economic forces, and planning decisions. This analysis may involve understanding how cities become divided into distinct neighborhoods with varying levels of access to resources, infrastructure, and cultural amenities (Felicciotti et al., 2016; Karimi, 2023). This perspective allows scholars and planners to explore the underlying factors contributing to urban fragmentation and to develop strategies that promote more integrated and equitable urban environments.

The transformation in housing production, from individual housing units to changes at the scale of urban fragmentation, is part of a broader process where a single change can impact the entire urban fabric. This means that shifts in housing can influence the overall structure and dynamics of the city. These transformations can be examined at various scales, including the broader urban context, individual housing units, or, as in this study, specific urban fragmentation. Each level of analysis offers valuable insights into how changes within the built environment contribute to the evolving nature of cities.

3. METHODOLOGY

This paper adopts a reactive approach to present a case study. This approach involves examining the causes and consequences of a problem after it has occurred and reorganizing efforts to address the issues (McDonald et al., 2019). In this study, a case study (Yin, 2018) and a comparative analysis method (Landman, 2008) were used together to understand how urban environments are transformed through the reconfiguration of physical spaces. A case study is a method where a single case or event is examined in-depth and longitudinally, with data

systematically collected to observe what happens in the real environment (Creswell, 2013; Yin, 2018).

This part of the study follows Creswell's (2013) five-step process: define a question to investigate, case selection, data collection, data analysis, and reporting (Figure 1). The data analysis step employs comparative analysis, a method that compares two or more cases, events, groups, or phenomena to reveal similarities and differences (Przeworski & Teune, 1970; Ragin, 1987).

Comparative analysis is particularly suitable for understanding the effects of a specific phenomenon in different contexts (Landman, 2008). In this investigation, data were compared based on established criteria to identify similarities and differences. This approach provides both in-depth information about a specific context and insights into how findings can be generalized and vary under different conditions.

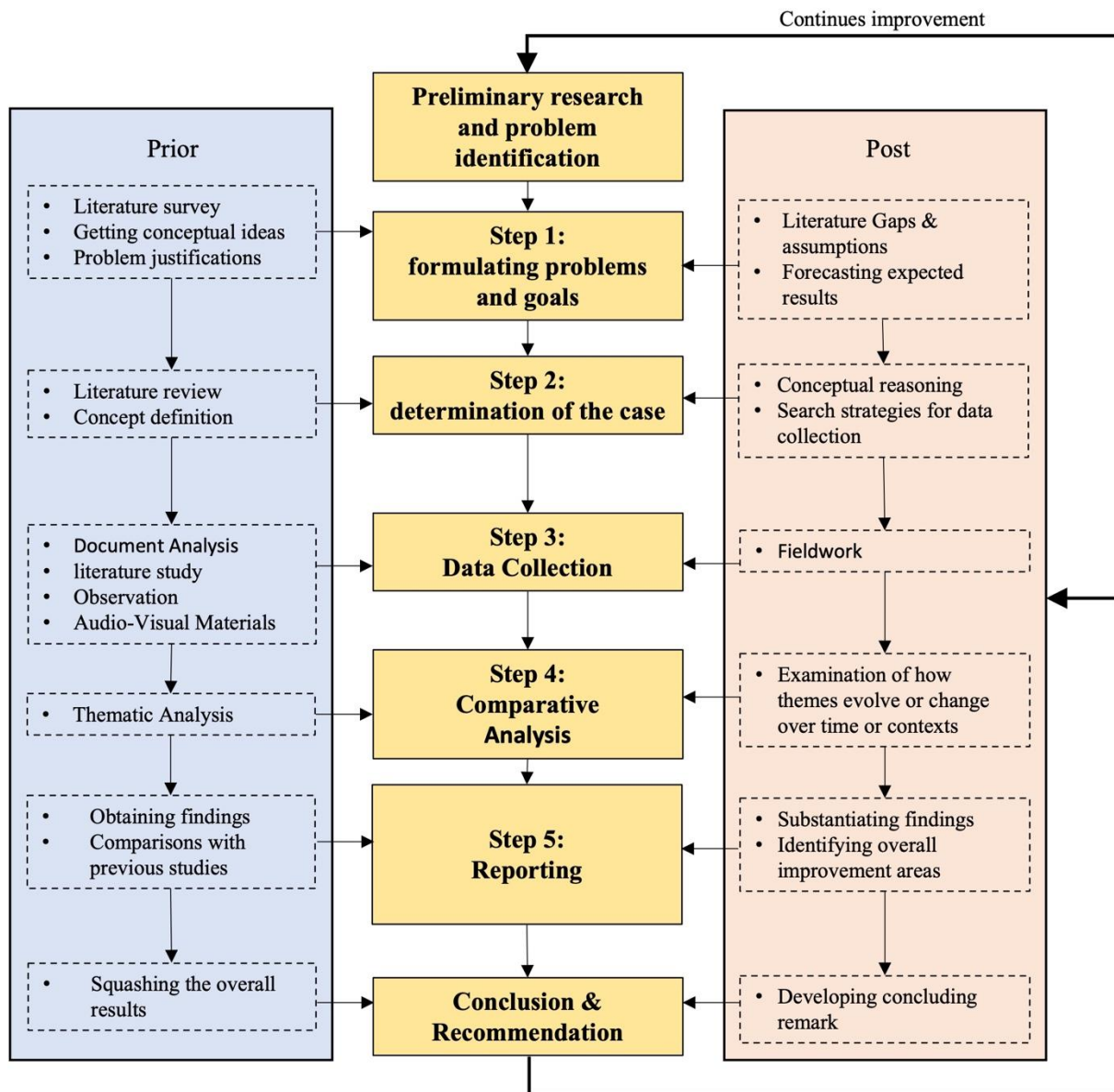


Figure 1: Research Process Diagram (Created by the author)

4. CASE STUDY

For the case study, a region from the metropolis of Istanbul, Turkey, has been selected. Metropolises are cities where physical changes in residential areas are most pronounced. The Zincirlikuyu neighborhood in the Esentepe district of Istanbul has been chosen as the case study due to the significant transformations it has undergone over time.

The most important transportation axis in the region actively used today is Barbaros Boulevard and several main arteries connected to it. Today, the districts of Zincirlikuyu and Mecidiyeköy feature a dense commercial structure and high-rise buildings, whereas in that period they were known as Mecidiye Köyü (Mecidiye Village) and Zincirlikuyu Farm.

The neighborhood is located where Büyükdere Avenue turns from Zincirlikuyu towards Gayrettepe today, with access to the neighborhood provided by Kore Şehitleri Avenue and Yüzbaşı Kaya Aldoğan Street.

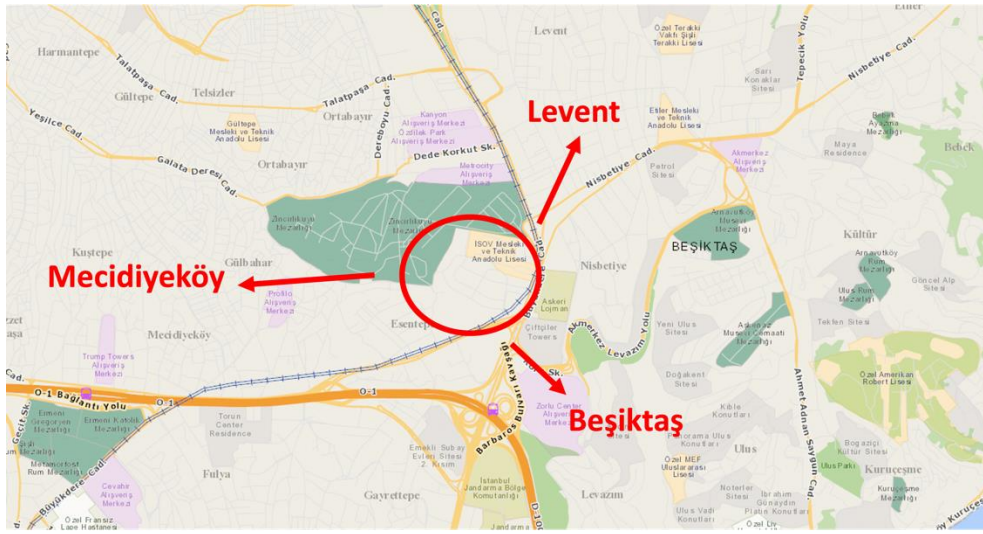


Figure 2: The Case Study Area: Merbank neighborhood (Harita Istanbul, 2024)

4.1. Merbank District from Past to Present

In Turkey, the period between the proclamation of the Republic in 1923 and 1950 was marked as a time supporting social housing production (Akalin, 2016) During these years, Turkey witnessed the emergence of social housing production and cooperatives as significant phenomena in urban development. The country's housing cooperatives played a crucial role in post-war housing initiatives, reflecting a blend of global influences and local needs (Avaner & Hasanoğlu, 2020). One such cooperative was the Merbank Cooperative established by employees of the Central Bank, which contributed to the construction of social housing areas in Ankara and Istanbul (Bayraktar et al., 2014). Formed in 1948, the Merbank Cooperative, established by Central Bank employees, developed the Merbank neighborhood in the Zincirlikuyu area (Sayar, 1952). Furthermore, during the same period, efforts focused on housing for segments of society outside the privileged classes can be observed, as evidenced by examples like the Etiler Housing Cooperative located in a nearby area (Avaner & Hasanoğlu, 2020).

One of the first neighborhoods to carry the traces of a planned neighborhood initiative adjacent to the Zincirlikuyu Cemetery in this area is the Zincirlikuyu Merbank Neighborhood. It is considered one of the first planned "ideal" neighborhood productions to be integrated into Istanbul's expanding urban fabric towards the north (Dayioğlu, 2021) To understand the area where the Merbank neighborhood was established, aerial photographs from the period were

examined. Comparisons of the appearances before and after the establishment of the neighborhood (Figure 3) revealed that there was no construction in the area before the Merbank project. The neighborhood needed roads and transportation axes to establish connections with the rest of the city.



Figure 3: Aerial photographs of 1946 (left) and 1966 (right) years (Harita Istanbul, 2024)

Since the neighborhood was built on entirely vacant land at the time, the cooperative undertook the responsibility for its infrastructure needs. According to Sayar (1952) the cooperative received assistance from the municipality only for street lighting and spent twice the cost of the land on these infrastructure works. Furthermore, a competition was held for the parceling of the neighborhood, and among several architects, Turgut Cansever's project was selected (Figure 4). The architectural designs and construction oversight were managed by Architect Zeki Sayar, who published the project's details in *Arkitekt* journal in 1952. The general layout plan of the site is seen in Figure 4, which was produced by artificial intelligence management through reference to Sayar's (1952) study.

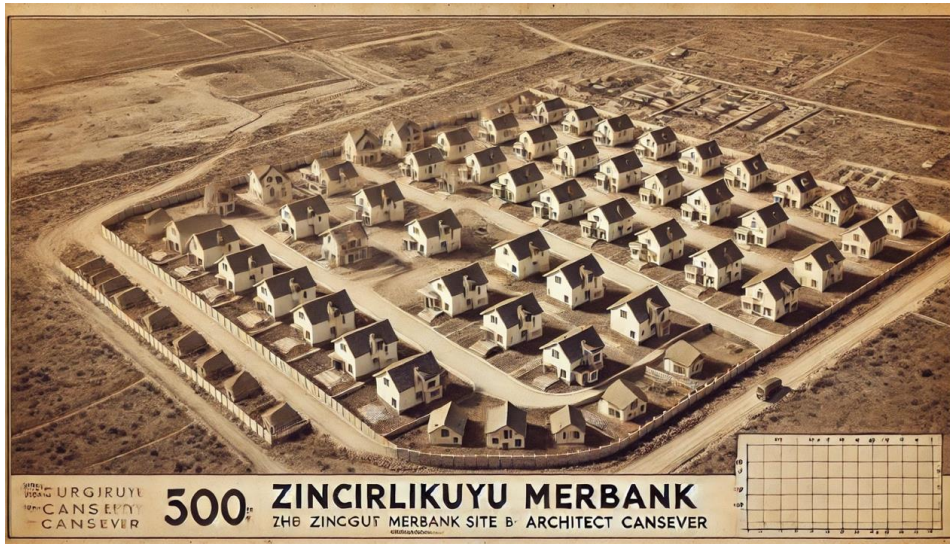


Figure 4: Merbank District (Created by the author via DALL-E)

In the Merbank neighborhood, detached houses vary in size. The smallest is 2+1, and the largest is 7+1. Despite their higher costs, Sayar noted that the higher costs were justified due to the spaciousness and the inclusion of private gardens. Sayar explained that the five-room, two-story houses were designed to accommodate two families (Figure 5). Additionally, as an architect

who valued greenery and natural surroundings, Sayar highlighted the afforestation efforts in this project. He noted the presence of large chestnut trees on the project site in the 1950s and mentioned that the newly planted trees would gradually enhance the neighborhood's greenery, eliminating any barren areas over time (Sayar, 1952). However, looking at the current state of the area where the project was executed, it is evident that the green spaces Sayar described in the 1950s no longer exist.



Figure 5: Example of Merbank Houses (Sayar, 1952)












5. Findings

The following findings, derived from the research conducted in the context of urban environments within reconfigured physical spaces, aim to present the gathered insights. The data collected through the methods and analysis techniques used in the research process have revealed significant conclusions and results related to the topic. These findings have been evaluated by comparing them with existing literature and recommendations have been developed to guide future studies. The findings obtained throughout the research are detailed below.

Firstly, the historical changes in the area were evaluated at the planning level in a two-dimensional manner. For this purpose, historical aerial photographs from past years were analyzed using archival records from the Istanbul Metropolitan Municipality (IBB). The results of the analysis are shown in Table 1.

As observed in aerial photographs from 1946, there were no buildings on the site where the Merbank neighborhood was located, nor in its pre-project state. By 1966, photographs show that the Merbank houses had begun to develop. The neighborhood was established and functioning as planned, with construction also starting in adjacent areas.

Table 1: Historical analysis historical analysis of urban fragmentation

	1946	Before the district was established
	1966	Construction of Merbank neighborhood and other residential areas
	1970	Block settlements begin to replace detached houses, and the direct relationship of buildings with greenery begins to deteriorate due to the increasing residential surface area. In the site plan, new constructions are seen in the southern part of the neighborhood.
	1982	
	1987	The northern part of the neighborhood, consisting of single houses, has been damaged. The vacant lands in the southwestern part have started to be filled with construction activities, and we can talk about construction that has completely covered the periphery of Merbank District. Single houses continue to show themselves in the northern part of the neighborhood, which we can describe as its center.
	1993	
	2006	The neighborhood is close to completely losing its original texture. High-rise buildings began to be settled instead of detached houses, and the low-density identity of the neighborhood disappeared over time. However, based on the current situation of the neighborhood, vehicle-pedestrian roads still reveal themselves as another element that forms the identity of the neighborhood.
	2011	
	2013	
	2018	Dense construction, change in function, increase in the number of floors, change in neighborhood texture and social deformation
	2024	

Between 1970 and 1982, there was a marked increase in the rate of development. The increase in the number of residential buildings has led to a reduction in green spaces. The site plan indicates that new buildings began to emerge in the southern part of the Merbank neighborhood. From 1987 to 1993, notable changes in the neighborhood's structure were observed. Physical spaces were transforming. Detached houses in the northern section were being redeveloped, and vacant plots in the southwest were turned into construction sites. Development spread across the entire perimeter of the neighborhood. The northern area could be identified as the neighborhood's center, where the original detached houses continued to exist. Three aerial photographs from 2006 to 2013 were analyzed. By then, the Merbank neighborhood was approximately 50 years old. The original detached houses in the center were undergoing redevelopment, and the neighborhood was on the verge of losing its unique character. High-rise buildings were replacing detached houses, resulting in a significant population increase and altering the neighborhood's social identity. The only unchanged aspect during these years was that the neighborhood retained traces of its original site plan concerning vehicular and pedestrian pathways. As of 2024, intense development and a substantial loss of green spaces have become prominent (Figure 6).




Figure 6: A view from today (*Harita Istanbul, 2024*)

This section presents the findings from the fieldwork conducted as part of the case study on reconfigured physical spaces. Through comprehensive data collection and analysis, key insights and trends have been identified that shed light on the core issues and dynamics within the studied area. The following findings offer a detailed examination of the observed phenomena, providing a deeper understanding of the subject matter and highlighting significant patterns that emerged during the research process.

Initially, observational and photographic surveys were conducted to assess the current state of "merbank" houses in the area. Using a cadastral plan obtained from the municipality, both the previous and current conditions of these houses were identified and documented. This phase of the study includes an analysis of density, floor levels, and functional aspects of the area (see Table 2).

Table 2: Analysis of Physical Transformation

	Comparative Analysis	Examples
Density analysis		
Floor height analysis		
Function analysis		

In this analysis, the current state of the neighborhood has been examined in terms of population density, building height, and functionality. This examination provides a more detailed assessment of the existing urban structure of the area.

The density analysis reveals that a significant portion of the buildings in the neighborhood are occupied. This indicates a high occupancy rate and suggests that residential units are being utilized effectively. Such density can also be considered an indicator of the efficient use of urban space. However, considering the neighborhood's historical fabric, it is evident that both building and population growth have significantly increased.

According to the building height analysis, there is a diversity in the number of floors across the neighborhood. While one- and two-story structures constitute a large part of the area, buildings with three or more stories also hold a prominent position. This suggests that the neighborhood is undergoing an evolution in the process of urban transformation, with the construction of buildings of varying heights.

In terms of functional composition, the neighborhood hosts not only residential areas but also commercial, cultural, and multifunctional spaces. This diversity indicates that the neighborhood serves as a multifunctional area where not only residential but also commercial and cultural activities take place. This highlights the diversification and development of the neighborhood's social and economic structure.

6. CONCLUSION AND RECOMMENDATIONS

The change in physical spaces is not only an architectural intervention but also directly affects social relations, social interactions, and the quality of life of individuals. Spatial changes can increase interaction between social layers, strengthen social harmony, and enable individuals to live more securely and with a sense of belonging. The study of the Merbank neighborhood in Zincirlikuyu, Istanbul, provides a valuable case for understanding the intricate relationship between physical space and social interactions over time. The study examined how the social environment is transformed through physical spaces. Changing needs and social dynamics draw attention to the reorganization of physical spaces and the effects of these spaces on social structures.

The findings section of this paper reveals significant changes in the current building density levels in the Merbank neighborhood. An examination of the period from the 1960s to the present shows that the area, initially characterized by low density, has experienced an increase in density with the construction of high-rise buildings over time. This transformation has considerably affected the social identity and demographic structure of the region.

During the initial planning period, Merbank houses were typically designed as detached homes with large gardens. However, today, these structures have been replaced by high-rise apartment buildings. This functional change has also altered the lifestyle and social interactions of the residents. For instance, instead of large gardens where children could play, there are now limited green spaces and common areas.

The original planning of the Merbank neighborhood envisioned extensive green areas and afforestation efforts. However, in recent years, intensive construction has led to a significant reduction in these green spaces. This situation inevitably has potential negative impacts on both environmental sustainability and the quality of life of the neighborhood's residents. The original low-density structure of the neighborhood, composed of single residences, has been replaced by high-rise buildings and dense construction, leading to a loss of the neighborhood's identity.

The current state of the neighborhood reveals significant changes resulting from intense construction activities and urban transformation processes. The increase in population density, the diversity in building heights, and the variations in functional areas indicate that the neighborhood has evolved into a dynamic and multifaceted urban space. These changes are critical factors that affect the identity and character of the neighborhood. The shift from its original low-density, single-residence structure to a high-density, multi-functional urban fabric has had notable impacts on the broader urban framework. This transformation is a crucial issue

that must be carefully considered in future urban planning processes. The preservation and enhancement of both the physical and social fabric are of paramount importance to ensure that the neighborhood remains a sustainable and livable urban area.

Various suggestions have been developed based on the results obtained. First of all, reorganized physical spaces should be designed with long-term sustainability goals in mind. Flexible spaces can easily adapt to changing needs and be prepared for possible changes in the future.

During the reorganization of physical spaces, existing cultural and historical values should be preserved, and these values should be integrated with new designs. This will contribute to the preservation of social memory and identity.

Smart city technologies and innovative design approaches can make physical spaces more functional and user-friendly. These technologies can provide faster and more effective solutions to social needs.

Based on the findings of this study, the following recommendations have been developed for future research. Investigating the long-term social impacts of restructuring physical spaces can enhance our understanding of the effects of these changes on sustainability and social cohesion.

Studying the effects of restructuring cultural and historical sites on social identity and memory can highlight the importance of these projects for social cohesion and cultural continuity.

Examining the impacts of smart city technologies and innovative architectural approaches on physical spaces can inform future design and planning processes. This is crucial for understanding how smart infrastructures affect social interaction and community cohesion.

Combining perspectives from various disciplines such as sociology, psychology, architecture, urban planning, and environmental sciences can provide a more holistic examination of the effects of physical spaces on social transformation.

These recommendations can help future research be more comprehensive and in-depth, leading to richer and more detailed insights into the impacts of physical spaces on social structures.

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