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Bilge Kobak

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Saba MATIN AYGÖREN

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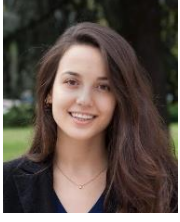
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The Landscape of Transportation Nodes: A Design Statement for the Regeneration of Abandoned Railway Landscapes Through Case Studies



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Abstract: *Transportation nodes of urban landscapes such as airports, railways and ports have great potential since they are one of the major systems that shape the cities. Analysing their use through time and seeing how they were shaping the cities gives us the design principles to be considered for the transformation process into a public place after their abandonment. It is complex to plan their design, but the before-during-after processes should be acknowledged while dealing with a node of transportation. Referred sites are no longer just functional elements of the transport system but they also act as mixed-use urban nodes. Hence, they require a broader approach and broader urban planning strategies considering the future scenarios. This paper proposes a categorization of industrial areas that are a part of transportation systems and ultimately defines a design statement for abandoned railway landscapes through international case studies. The resulting statement proposes that 8 principles should be considered: community involvement, natural process as a design form, heritage & history, adaptability, sustainability, integration of users, perception, and mobility & flow.*

Keywords: *Post-industrial, transportation landscape, railway, regeneration, mobility*

Ulaşım Peyzajları:

Terk Edilmiş Demiryolu Peyzajlarının Kamusal Alana Dönüşümü İçin Tasarım Beyanı Önerisi

Özet: Havalimanları, demiryolları ve limanlar gibi kentsel peyzaja ait ulaşım düğümleri, kentleri şekillendiren en önemli sistemlerden olmaları nedeniyle çok büyük bir potansiyele sahiptir. Zaman içindeki kullanımlarını incelemek ve kentleri nasıl şekillendirdiklerini görmek, terk edildikten sonra kamusal alana dönüşüm sürecinde dikkate alınması gereken tasarım ilkelerini sunar. Bu alanları şehrin kamusal alan ağının bir parçası haline getirmek ve tasarımlarını planlamak kompleks bir süreçtir ve öncesi-sırası-sonrası süreçleri planlanmalıdır. Referans verilen alanlar artık ulaşım sisteminin işlevsel öğeleri değil, karma kullanımlı kentsel alanlar olarak faaliyet göstermektedir. Bu nedenle, gelecek senaryoları dikkate alınarak daha geniş bir yaklaşım ve daha geniş kentsel planlama stratejileri gerektirmektedir. Bu makale, ulaşım sistemlerinin bir parçası olan endüstriyel alanların bir kategorizasyonunu önermekte ve nihai olarak uluslararası örneklerin analizi yoluyla terk edilmiş demiryolu peyzajları için bir tasarım beyanı tanımlamaktadır. Sonuç olarak tasarım beyanı; topluluk katılımı, doğal süreçlerin tasarım biçimi olarak kullanılması, miras ve tarih, uyarlanabilirlik, sürdürülebilirlik, kullanıcı entegrasyonu, algı ve iletişim, hareketlilik ve akış olmak üzere 8 prensip altında toplanmıştır.

Anahtar kelimeler: Post-endüstriyel, ulaşım peyzajı, demiryolu, rejenerasyon, dönüşüm

1. INTRODUCTION

The industrial revolution introduced us with new infrastructures that characterized our landscapes resulting in the phenomena of industrial landscapes. Due to different reasons such as war, emergence of new technologies, urban development etc., these landscapes became abandoned, disused, or neglected. Traditional industries have decreased, leaving us with derelict lands. Many of these sites have been colonized and naturalized by the landscape, resulting in large fields that are now a part of the city's fabric. As the urbanization continues, urban planners and landscape architects began to find ways to reclaim these lands by transforming them into public parks. Although these parks are called "brownfield parks" and examined under the umbrella of this general perspective, this article proposes a function-based categorization of industrial landscapes and examines abandoned railway landscapes under the category of transportation as a branch of infrastructural landscapes. Because the abandoned railway landscapes are studied from a transportation viewpoint, categorization is an important part of this research. Furthermore, an understanding of the railway landscape sites and the reasons that lead to abandonment are studied. The statistics from across the world concerning the abandoned railway sites are presented to emphasize the potential of these places to become active public areas that can be part of larger urban planning strategies towards sustainable, resilient, and just cities. The third chapter is dedicated to case studies where a concentrated form of an in-depth analysis is completed. The case studies are selected according to their comparability considering their size, age and international recognition. Some case studies are relevant as regards to reclamation techniques, others concern the significant relationship with the community as well as the relationship between human and environment. Finally, a design statement is created for the transformation of disused railway landscapes into public places. The statement is created after a careful examination of the patterns and processes that appear in the selected 9 case studies and it consists of 8 principles that were interpreted from the analysis. The present research studies underestimate the influence of the "mobility" notion on transportation landscapes by examining the examples in comparison with brownfields that have other functionalities. By focusing on railway landscapes, this article aims to propose a heightened awareness of the enormous potential of abandoned transportation landscapes as an activator and connector on an urban scale and hopes to encourage further research into the other typologies that fall under the category of transportation landscapes.

1.1. Research Gap & Objectives

There are many research papers focusing on brownfield reclamation, transformation of post-industrial areas and management of disused infrastructural landscapes which do not take a special approach to disused transportation landscapes. They look into best practices under the umbrella of "brownfields parks," which is a broad term that does not allow them to look into specific techniques. Hence, in this article it is suggested that brownfield landscapes should be separated into categories according to their functions. A categorization of transportation landscapes into 3 typologies: airports, ports and railways is presented; and an examination focusing on their characteristics as linking destinations and the presence of the mobility action is proposed. Because of the scope of the study, this research focuses on the typology of "railways", hoping to encourage further research on other typologies presented.

The main objective of this study is to create a design statement that will act as a guideline for the transformation of disused, abandoned, neglected railway landscapes that are no longer operating. Taking railway landscapes under the category of transportation, rather than approaching them from a general perspective of brownfield reclamation or post-industrial etc., a heightened awareness of the patterns and processes of transformation is presented through the analysis of 9 railway landscape regeneration projects.

1.2. Methodology & Research Questions

The research is framed by the analysis of case studies where patterns, common strategies and processes are examined. The investigation of existing knowledge and the study of best practices are an essential component of research culture. Hence, the quantity and variety of projects in varied socioeconomic and geographical backgrounds provide adequate information to validate the research premise.

Ultimately, the mass of knowledge of literature and best practices are being used to develop a design statement on the issue through which the following questions are tried to be answered.

- What principles should we follow when transforming a former railway landscape into a public place and what are the factors that contribute to the success of the project? Is it possible to create a guideline that shows not specific actions but the approach and strategies towards post-industrial railway landscapes?
- What role does “history” play in post-industrial railway landscapes? And how can we use design to convey the many layers of history?
- What phases does a railway landscape go through until it is reclaimed and what can we learn from the life cycle of railways?
- What are the strategies for the preservation of characteristics of the railway landscape site?
- Can we talk about resilience to change during the transformation of a former railway landscape?

2. INDUSTRIAL LANDSCAPES

2.1 History

In order to understand the industrial landscapes of today, we need to understand how they emerged since landscape is a dynamic process between humanity and environment. Landscapes are shaped by the human activity. Hence, we should explore the activity that resulted in the emergence of industrial landscapes, which we can date back to the industrial revolution. The industrial revolution was the beginning of a new era that is characterized by the domination of industry and machine manufacturing, changing habits, labour, and landscapes. Since the industrial revolution, a critical alteration in population has occurred, resulting in a rise in the population in urban areas. People have started to migrate from rural areas to urban centres in order to find better jobs to be able to have better life conditions. As a result of this migration, urban settlements began to spread which led to the phenomenon known as urban sprawl. This term can be defined as the changes in the urban density at different distances from the city centre [1]. These distances rose in tandem with urban development, making transportation even more crucial in meeting the demands.

Around the end of the 19th century, with the second wave of industrialization, global systems of transportation and communication arose. Infrastructures to support the new urban life had to be developed. Hence, landscapes have changed accordingly. Industrial concerns have produced the logistics landscapes in which more land area is given over to accommodate the shipment, staging, and delivery of shipped goods [2]; networks of railway lines began to merge into huge areas of industrial landscape [3].

In the late 20th century, the transition from the second wave of industrialization to the third began. This wave was exposing an environmental crisis, primarily caused by the unsustainable use of resources in industry. Globalisation and de-industrialisation were the phenomena, and the landscape was eventually influenced by all of these developments, with new typologies emerging such as post-industrial landscapes [4].

2.2 Landscape of Infrastructures

The waves of industrialization presented us new typologies of landscapes such as manufacturing lands, mining lands, waste lands and transportation landscapes. In the next chapter, a categorization of these typologies will be presented. In the scope of this article, we will be concentrating on the railway typology as a leg of transportation landscapes under the umbrella of infrastructure landscapes.

According to Oxford Language, an infrastructure is the basic physical and organizational structures and facilities needed for the operation of a society or enterprise. Landscape on the other hand is described

as everything you can see when you look across a large area of land, especially in the country. Meanwhile, Charles Waldheim describes landscape as a model for urbanism and a disciplinary locus for discussion historically housed in architecture, urban design and or planning [2]. Hence, the understanding of both terms can be summarized as infrastructure being the alteration of natural environment while landscape being a vision of a piece of land that is already existing without any action but looking. Their combination offers an opportunity to redefine both notions into a more integral design brief where goals and means converge, resulting in operative landscape structures that serve multiple ends [5].

Infrastructures, by virtue of their scale, ubiquity and inability to be hidden, are an essential component of the urban landscape today [5]. They are a part of our everyday scenes. Hence, as landscape architects we should find ways to appropriate these infrastructures as landscape. This will help us to bring out the potential of these typologies to be transformed into public spaces through the understanding of the dynamic between structure and process [6]. Landscape infrastructures that facilitate different nodes of transportation can be categorized as transport landscape infrastructures. This category includes vehicular, rail, air, and port systems. For the framework of this thesis, we are interested in post-operation life of these landscapes.

2.3. Categorization of Industrial Landscapes

Towards a Landscape Typology of Transportation Nodes

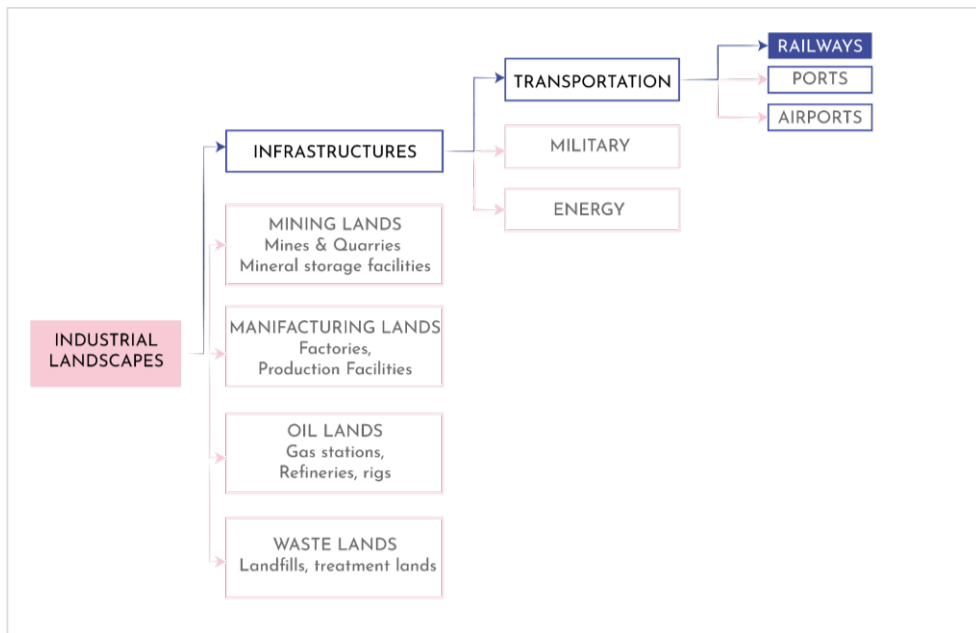


Figure 1. Categorization of industrial landscapes into typologies according to their function (Improved by author).

The concept of industrial areas is gaining more importance through the development of new technologies. They present a mix of typologies that consist of different characteristics such as landfills, gas stations, mining lands, quarries, or facilities of production etc. These areas have been categorized differently in different articles depending on the aim of each one. For instance, they can be categorized according to their former function, their level of contamination, their level of abandonment etc. EPA (U.S. Environmental Protection Agency) launched a classification in 2005 focusing on specific categories of brownfields such as mine-scarred lands, abandoned railway structures, underground storage tanks [7]. For this study, a categorization based on the function is presented. While some of the other categorizations have a different approach about the transportation group, here it is taken as a part of infrastructure landscapes and it consists of 3 different typologies such as railways, airports, and

ports. The aim of the study is to create a research area for the landscapes created by the activity of transportation under the infrastructure leg of the industrial landscapes. Landscapes of transportation represent the past and current movements of the society while shaping the future layout of the cities. This categorization is important because the transportation function is important in shaping cities since the related infrastructures are a part of the landscape today. In this article, we will be focusing on the railway typology and ultimately create a design statement for railway landscapes with the aim to inspire future work related to other typologies of the transportation category.

2.4. Railway Landscapes: Barrier or Connector?

In today's industrialized world, it is hard to imagine an urban landscape without the infrastructures which are built for the transportation activity. We may look at these structures as a disturbance and an intervention on natural land, but we can also look at them as a connector that links different parts of the urbanized world, a bridge between different worlds, the possibility to bring communities together since they provide mobility, hence access. Along with possibilities, the landscapes of transportation also provide us with the different layers of history. While airports changed the way we look at landscape with the invention of aerial views, ports have taught us that the edges are not the limits. And railways, a more urban-integrated type of transportation landscapes, provided us with the traces of movements throughout history. Not only with their layout, also with the beautiful architecture of the stations which were the gateways into cities and that is why they became important landmarks in the history of cities. They are a part of the architectural heritage of the 19th and early 20th centuries. Some of them are the most important buildings in the towns in which they were built. They represent the architecture and art of their time with their decoration, highlighting the importance of this mode of travel for the community [8].

One can see railways as barriers and maybe even consider them as a threat. From the landscape point of view, they act as a barrier since they create two sides and divide the natural land into two. However, they also have a major influence on social and economic development which helps society evolve. They provide opportunities and mobility by linking destinations as well as a panoramic experience along the way. This experience represents the dynamic interaction between human and environment because of the change in the scenery between the destinations. In conclusion, they are connectors as well as barriers. The urban pattern is highly affected by the railways, hence they are separators because of its effect on city layout. On the other side, they are the direct link between communities, towns, and landscapes. Once ecological compensation is created, these typologies become the connectors as well. Built environments and human influence do not always have a negative impact on nature. The key is in the relationship between humanity and environment; to create the balance. Instead of viewing them as something apart from our environment, we simply should find a way to co-exist together. Because in the process of urban dynamic development, the construction of these infrastructures is inevitable.

2.4. Reasons for Abandonment

The history of abandonment dates back to the worldwide economic depression between 1929 and 1939, famous as the Great Depression since "profit" is the main reason for abandonment. In the United States the rail service was already well developed during the 19th century and the railway network already exceeded 430.000 kilometers of lines at the beginning of the 20th century. Based on the outdated technologies back then, the existence of a railway system came too early, leading to an inability to withstand progressive erosion of market shares by the transport on road. After WWI, it worsened and 230.000 kilometers of lines were abandoned in the last century [9].

Europe as well was affected by the political changes and new transportation typologies. The railway use in Europe was hit by the low-cost airlines since suddenly travellers could fly to anywhere in Europe with very small prices [10]. In Italy's case, for instance, starting from 1839, with the opening of the line between Napoli-Portici, the railway network has been representing the development of industry. After WWI rail transport faced competition with mobility on rubber. It suffered also during the 2007-2011 with the national railway undertaking the crisis, losing within only one year, over a

quarter of its trades. Eventually, the case of abandonment relies mostly on rail traffic. The trend in passenger and freight demand served by the railway system translates into increases or decreases in the supply of services and therefore in the number of trains running on the network.

2.6. POTENTIAL OF RAILWAY LANDSCAPES

2.6.1. Statistics

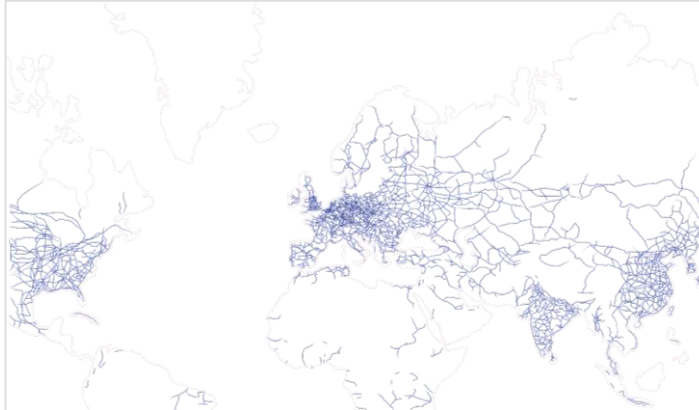


Figure 2. Railroad lines in the world (Improved by author).

About 2000 km of lines no longer active railways exist in Italy [11]. This number is 7600 km in Europe and 35,750 km in the US. With the organizations such as Rails to Trails, redevelopment of these derelict structures is initiated. The most common case is turning them into a part of slow mobility network with bicycle lanes and promoting sustainable mobility. This is a useful and cost-effective solution for abandoned areas, but in order for these locations to reach their full potential, a more comprehensive design should be developed.

The idea of reclaiming abandoned lines as greenways started in America with Rails to Trails Conservancy in mid-1960s and came to Europe during 1980s. Although there are not a certain total number of Europe's abandoned railways, we can make an assumption through the data provided by the programs of different countries in Europe. Spain with Programa Vías Verdes and France with Le Draisine E I Vélorail, Portugal with Ecopistas, England with the Sustrans Program (Sustainable Transport) and Belgium with RaVel (Réseau Autonome des Voies Lentes) can be examples of these programs which provide us with current statistics [12].

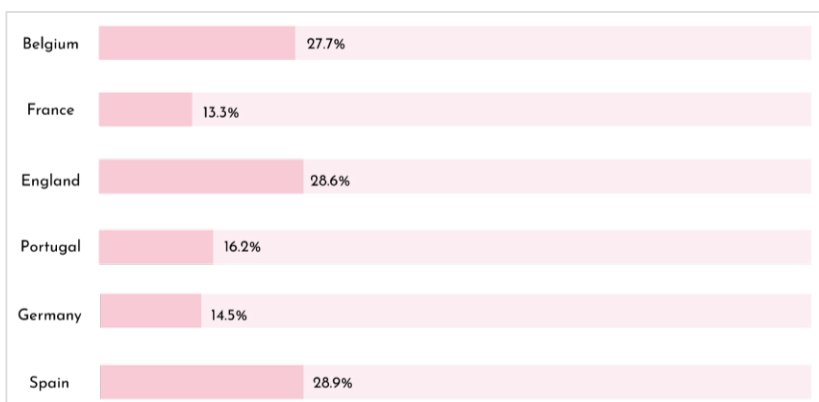


Figure 3. Europe's long way to reclaim the disused railways. Percentages of abandoned railways that are converted in green corridors (Improved by author).

Many countries are on their way to reclaim the abandoned railway landscapes. However, there is a lack of information regarding the assessment of how many kms of abandoned railway lines exist in these countries. The percentages of abandoned railways converted into green corridors in the countries that provide this information are illustrated in the figure above. To offer an indication; the number of total kms of old rails that have been converted into green trails is 400km in France, 733km in Portugal and 5020km in Germany. Considering the fact that about 2,8 billion cycle trips happening in Europe, the potential of these abandoned structures is immense [13, 14].

Many organizations are trying to raise funds and promote the reclamation of the abandoned railway lines. Also EU funded programs such as REVER MED project by the European Greenways Association are helping the progress [15, 16].

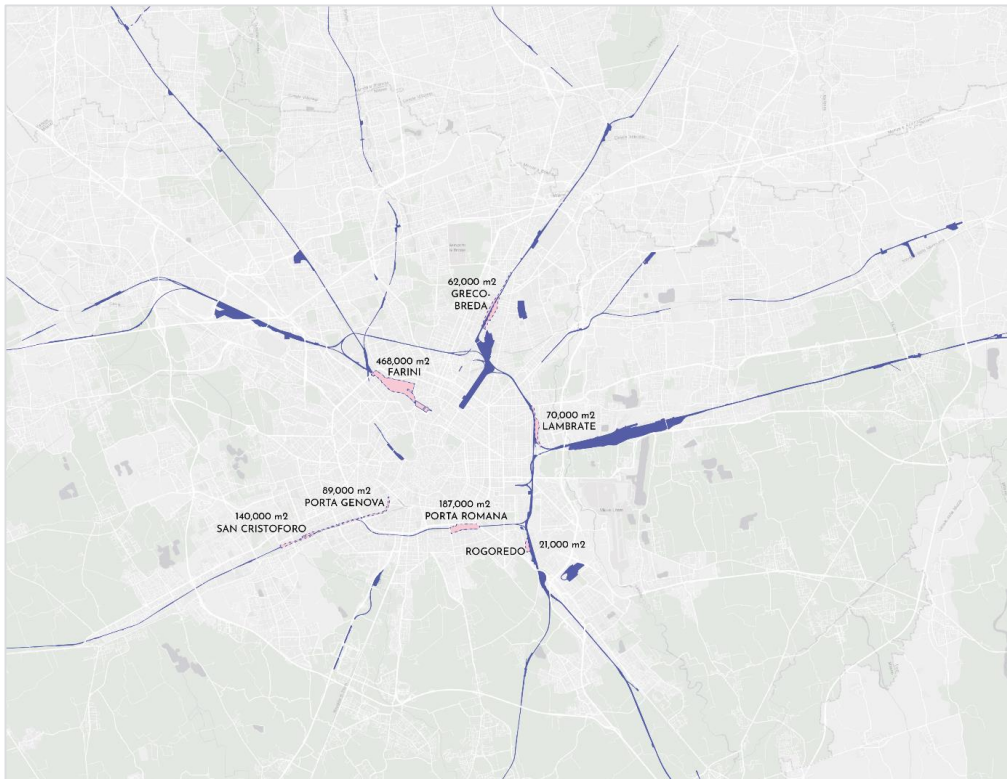


Figure 4. The 7 areas interested by the agreement (AdP) (Improved by author).

In Italy, the railway lines, passed by from about 6000km to over 10000 in 30 years since 1870. The network was then largely nationalized with the institution Ferrovie dello Stato (FS) in 1905 which expanded it in the thirties, to the threshold of 17,000 km [17]. Important programs such as “Scali Milano” or “Accordo di Programma” (AdP) initiated by FS, covering the city of Milan, proves the possibility of restoring abandoned railroad lines. The aim is to fund the city’s railway network system by the transformation of underused railway areas [16]. International competitions are being organized to decentralize the rail yards which in total make 130 ha of urban soil [18].

2.6.2. Life Cycle of Railway Landscapes

Understanding the series of changes that railway infrastructures undergo, hence their life cycle, is important in order to assess the future phases of the related areas. Like everything else in our environment, they are born, and they grow, yet, they do not have to perish; they can be repurposed while still reflecting history. Because they are a part of the transportation network and an expression of the various technological-industrial eras [10].

As landscape architects we are dealing with dynamic changes in environment. These infrastructures are a part of today's landscape and they have different stages that are circular. They start their lives by operating, connecting different parts of the national or international territories. After the operation phase, because of different reasons mentioned in earlier chapters such as decrease in profit, political decisions, low demand etc. they come to the stage of closing. After that, the residuals stage arrives, where the leftovers can be visible. Until their potential is realized they stay in this phase. Following this, the transformation phase begins where the site is given a new purpose, leading to the beginning of a new cycle. This new purpose goes through the same stages until its service is no longer needed and it needs to be transformed and adapted to the new needs of the society again. All past lives, leaving their traces to be told in the next life.

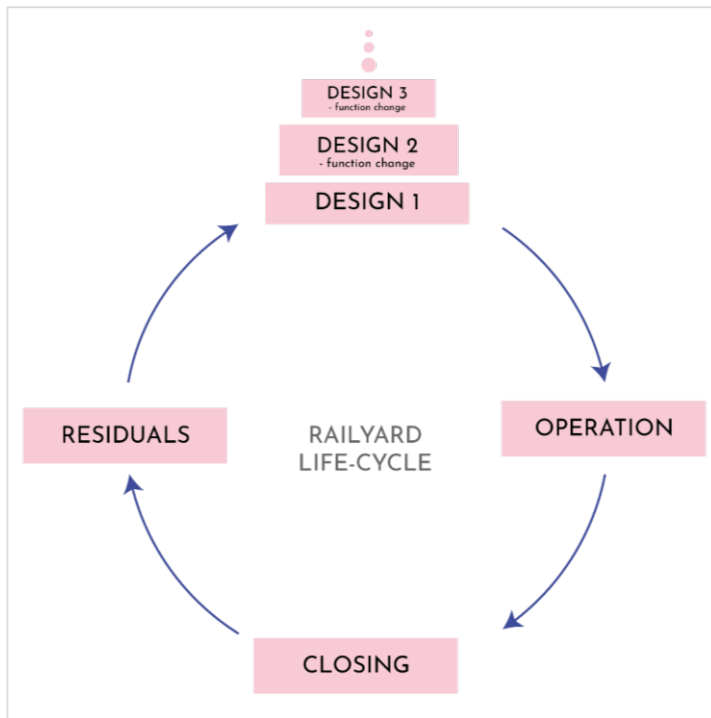


Figure 5. Life cycle of Railway Landscapes (Improved by author).

3. CASE STUDIES

The case studies are studied thoroughly in terms of location, historical development of the site, abandonment phase, design initiations, design approach, form and function (physical characteristics), botany, phases, site observations, daily operations and maintenance etc. However, because of the scope of the article, only a summary is presented.

3.1. High Line



Figure 6. The site in relation to the open space network of the city (Improved by author).

The 2.33 kilometers long linear park is built on an abandoned elevated railway on which during the mid-1800s, freight trains provided supplies to lower Manhattan [19]. After the mid-1900s, the growth of air-transport and inter-state trucking started to affect rail traffic [20].

The project owes its success to ‘Friends of the High Line’ (FHL) who organized campaigns with the help of photographer Joel Sternfeld whose photos brought international attention as well as to the competition for ideas for the transformation [20, 21].

Opened in 3 phases and connecting 3 neighbourhoods, the project tackles challenges such as the reclamation, adaptive re-use, and preservation. Each opening provided an input for the next phase and contributed to its success. The user engagement brought an incredible popularity which contributed to the cultural development of the area. The botany in this project was the key to all proposed senses. The wilderness in the design recalls the abandonment years as seen in the photos of Joel Sternfeld.

This project is iconic in terms of community engagement, the scale, and the attention it brought to the potential of the transformation of abandoned railway landscapes. However, the budget makes it one of the most expensive parks in the world with an annual operating budget averaging around \$3 million a year [22]. Nevertheless, it is beneficial for the neighbourhoods it connects since the project has resulted in around \$2 billion in new developments [23].

3.2. Promenade Plantée

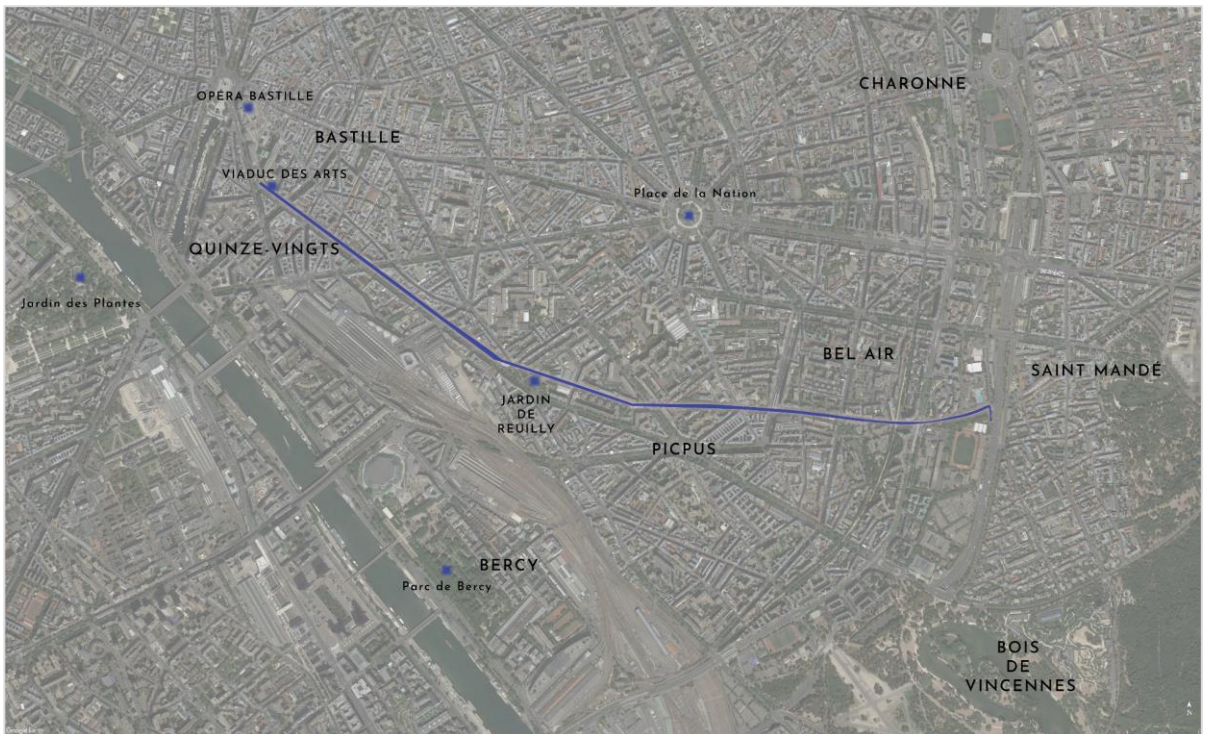


Figure 7. The site in relation to the open space network of the city (Improved by author).

Promenade Plantée or Coulée Verte René-Dumont is a 4.7 km long linear park built on an old, elevated railway, being one of the first examples that inspired many others such as the High Line. The Vincennes railway was opened in 1859 [24]. The abandonment was caused by the introduction of bigger trains and new technologies [25]. Meanwhile, under the viaduct, small businesses found places and the route was invaded by wild weeds and piled with garbage calling for an intervention [26]. Because of the historic significance of the line and the city's severe need for more green space, the concept of converting it to a public park received widespread support from governmental, charitable, and commercial sectors.

The design approach was centered around “place-making”; through architectonic imagination, ecological awareness, and social sensitivity. Its success is tied to an ongoing presence of people with act of motion and connection [25, 27]. It establishes a linear condition in varying height that connects the Place de la Bastille to the city's outskirts [25, 28]. Under the elevated portion, Viaduc des Arts exemplifies the characteristics of the 12th Arrondissement, with traditional artisan stores while playing an important role in East Paris' economic reconfiguration with its high-end artisanal stores; raising property values [25].

Promenade Plantée means “walk with trees” however locals generally refer to the site as “La coulée vert” which is translated as “green flow”. Hence, botany and movement are combined in the design. The designers took reference from horticulture itself as the whole concept is based on the French landscape practice of *préverdissement* [25]. Jardin de Reuilly, which was formerly the railway maintenance yard, is the most popular garden along the Promenade.

The official name Coulée Verte René-Dumont includes René-Dumont, one of the first ecologists to suggest in the early 1970s that we need to be careful with our planet, showing there was an intention to promote it as a place for ecology, as a tribute.

3.3. Parque Lineal Ferrocarril De Cuernavaca



Figure 8. Location of the corridor(Improved by author).

Built in 1898, Cuernavaca Railway connected Mexico City to the Acapulco port until the use was declined due to the Mexican Revolution. In 2016, the municipality launched an international competition for the site. The design team of Gaeta-Springall Arquitectos became the finalist. Currently, a part of the railway is operating with 3 trains per day [29]. Despite a lack of security and services, public users found habitat there. The city has been dealing with drought and water crisis caused by low rainfall [30]. As a response, the design team proposed an urban forest as a part of the city's open space network using water as a didactic element during the design phase. The 4.5-kilometer-long urban forest, which is of similar size with Promenade Plantée, unites 22 neighbours, serving over 50,000 people.

The active participation of locals and stakeholders added to the success of the project. Its success lies behind the link established between different districts in response to metropolitan size demands, and the process design as the team designed future phases and actions for long term and medium-term scenarios. Rain gardens were created to celebrate the water and a continuous red line along the corridor created a connection between features as well as a celebration on the rail lines [31].

3.4 Scalo Porta Romana



Figure 9. Location of the railyard (Improved by author).

Porta Romana is a part of the Scali Milano program, mentioned earlier. The municipality launched an international competition for the site, including public consultation [32]. The project aligns with the municipality's strategy plans and the vision of "Green Rays of Milan". 68% of the surface is open spaces including an urban park with 3500 trees that contributes to the municipality's ForestaMi project, aiming to plant 3 million trees by 2030 [33]. The proposal reflects the site's industrial past while reviving it with contemporary initiatives centered on the principles of sustainability, inclusivity, biodiversity, resiliency, connectivity and wellbeing. It pays homage to its rich past while providing shared living and working environments for a diverse group of residents, students, office workers, athletes, and visitors. Remediation of the old industrial site is created with intention to spread to the adjacent districts, each of which shapes the characteristics of the locations it reaches [34].

The project uses strategies such as "meanwhile uses" to engage users during the construction phases which is key to properly meeting the demands of the users, allowing for a test run before the construction is completed. It has a central park demonstrating Lombardy's nature, eco-zones, connections, elevated forest, designated and a homogeneous building complex that will host offices, residents, student housing, and temporarily the Olympic Village, ecozones including wetlands and thematic islands [35]. The process design is important since this part will become the focal point of another major urban and real estate change after the Olympics [36].

3.5 Atlanta Beltline

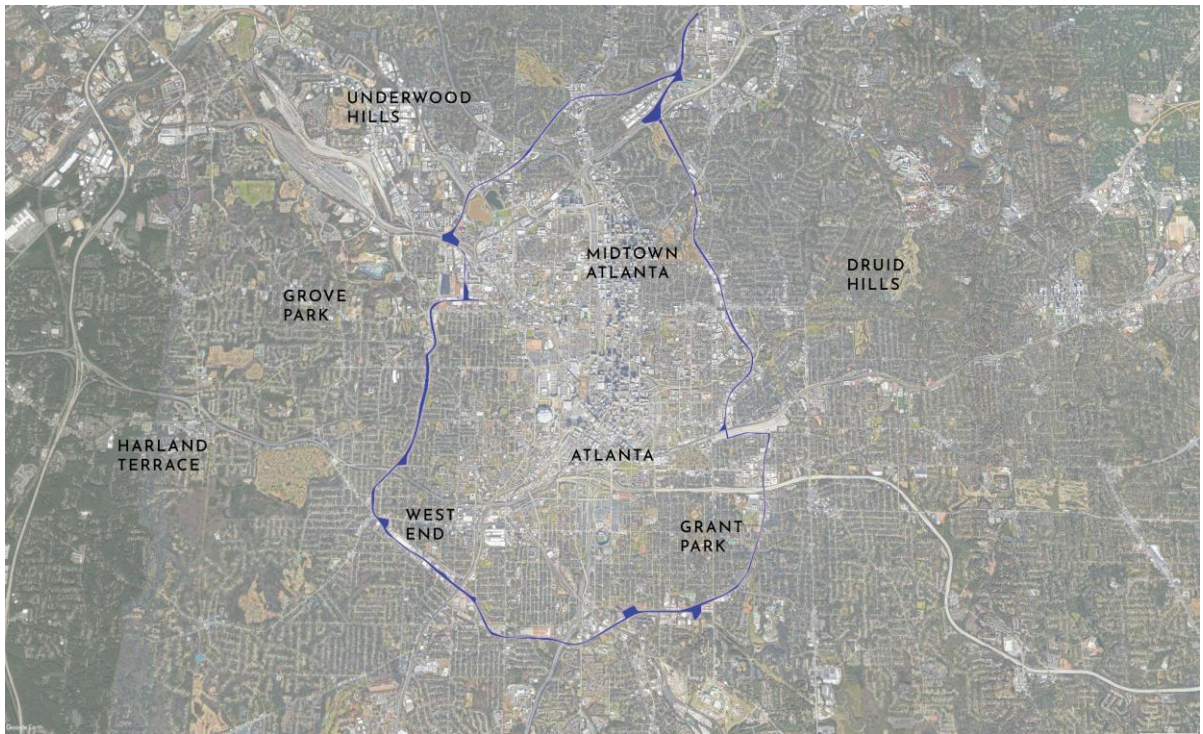


Figure 10. Location of the belt (Improved by author).

Located in an historical area with several railway corridors, the transformation took place on a 35 km long railway loop and the total trails are 53 km. It is a hybrid project that has both disused rails and active rails. It was created with the establishment of the NGO “Atlanta BeltLine Partnership” in 2005. The project continued to grow step by step. For example, the quarry on the west side was purchased by the City of Atlanta and turned into reservoir park. Then, an advisory board was formed to give priority to affordable housing. The Partnership continues to work nonstop to develop the project to this day, finding federal and private funding. The last major funding was provided by the Metropolitan Atlanta Rapid Transit Authority (MARTA) with \$570 million [37].

The BeltLine connects 45 neighbourhoods in which the poorest and the richest exist. Hence, it has the ability to transform the city considerably more profoundly than similar initiatives [38]. Around 2 million people visit the site which shows the need for alternative ways to circulate in the city. Despite the objectives as affordable housing, many people have been disappointed by the rise in housing costs, raising concerns about inequality. Following the demonstrations, the team claimed that they will try their best to keep their commitments [39, 40].

3.6 The 606 – Bloomindale Trail

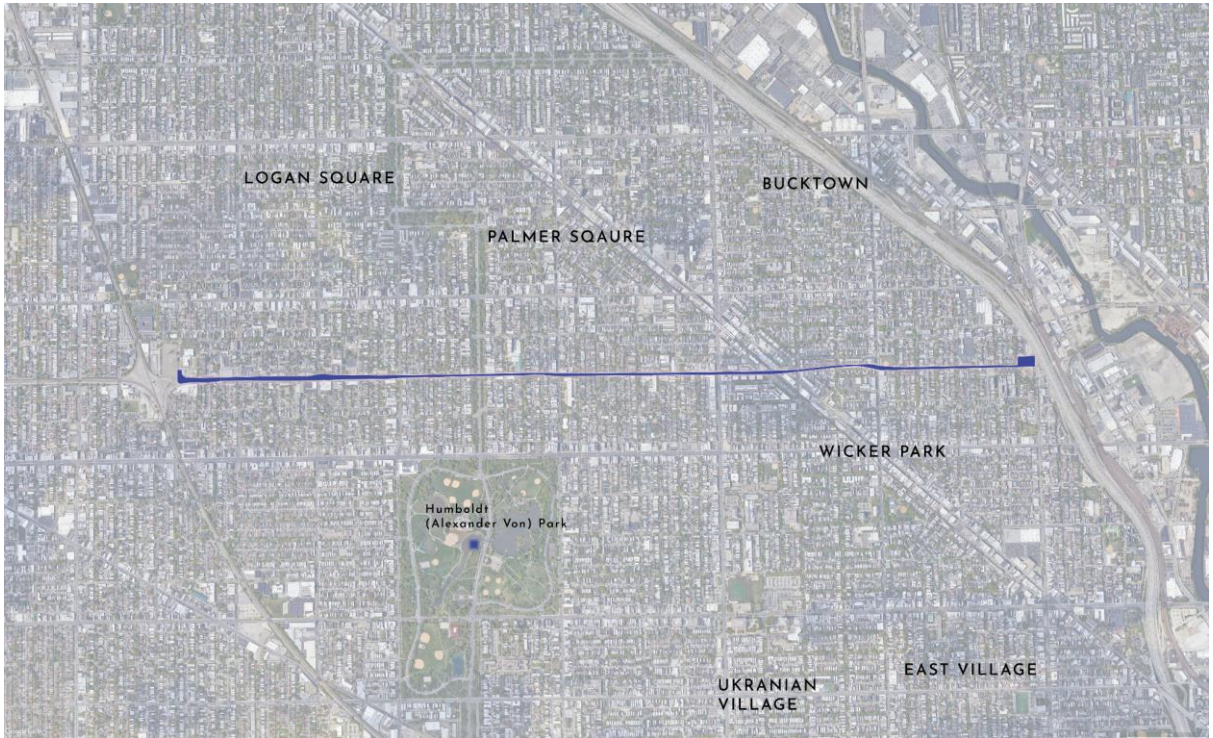


Figure 11. Location of the corridor (Improved by author).

The Bloomingdale one of the last remaining passenger railroads in the US to follow the instructions to elevate all rail tracks by 1899 for safety reasons. The rail line was operating until the 1980s giving service to a small manufacturing sector in furniture, bicycle, confection and instrument-making business. As a result of the lower demand, activity diminished, resulting in a lack of usage of the corridors by trains.

The neighbours became organized in 2004 and created the Trust for Public Land, working alongside the City of Chicago, the Chicago Park District, and the Bloomingdale Trail Friends. While there was an incredible effort to reuse the existing structures, an iconic new bridge was built for Milwaukee Avenue [41]. It connects diverse communities along its 4.3 km route.

The project's budget was \$95 million in total, and its finance relied heavily on the cycling infrastructure. Successfully, it received \$50 million in financing from the US Department of Transportation because it qualifies as an alternate transportation route, covering a significant portion of total budget. Although private donations are helping to fund most of the park, it is one of the Chicago Park District's most expensive capital projects in recent years [42].

3.7 Les Chemin De Carrières

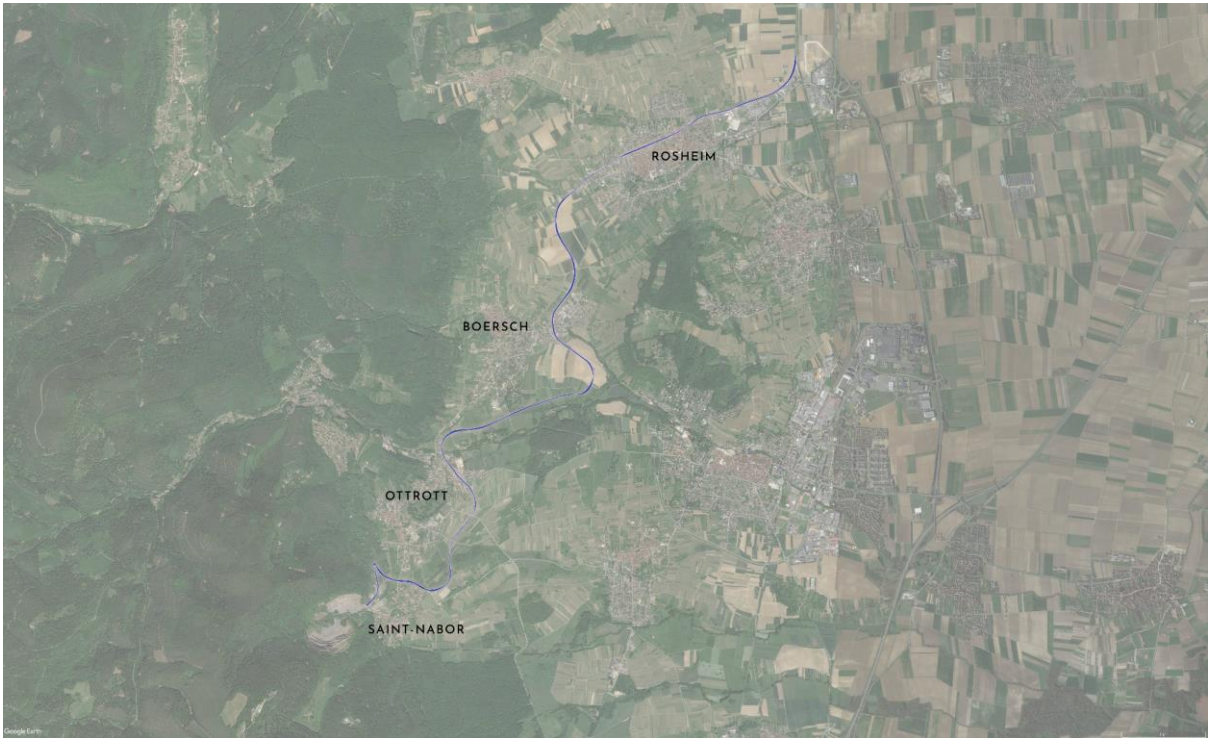


Figure 12. Location of the corridor (Improved by author).

The 11-kilometer-long Rosheim-St. Nabor railway started operating in 1902 to provide service to the sub-Vosges hills' quarries and to convey people between five communes. When the quarry company bankrupted in 2003, the freight service ended. An open call was announced in 2016 for the design. The idea of reconverting the rail tracks with cultural pavilions, along the pathway distinguishes from others with its designed structural elements [43].

The project has a strong ability to tell the story of the past. It has 4 chapters on the 4 train stops, each demonstrating different characteristics of the surrounding landscape through framing different views with steelwork as well as creating openings in the site. It is a complete artwork of story-telling with 3 stories; the water, the land and the story of travel. The project includes river enlargement, and the renovation of the former train station. Finally in the last stop, we see the quarries reconquered by nature. Chemin de Carrières means "Quarry Path" which demonstrates the importance of the final destination [44].

The project showcases a beautiful mixture of human-made world and nature with structural interventions. Architectural elements successfully demonstrate the idea to reverse the trend of urbanization and design rural areas attractively through the emphasize on their inherent qualities.

3.8 Lines of Life Singapore Park

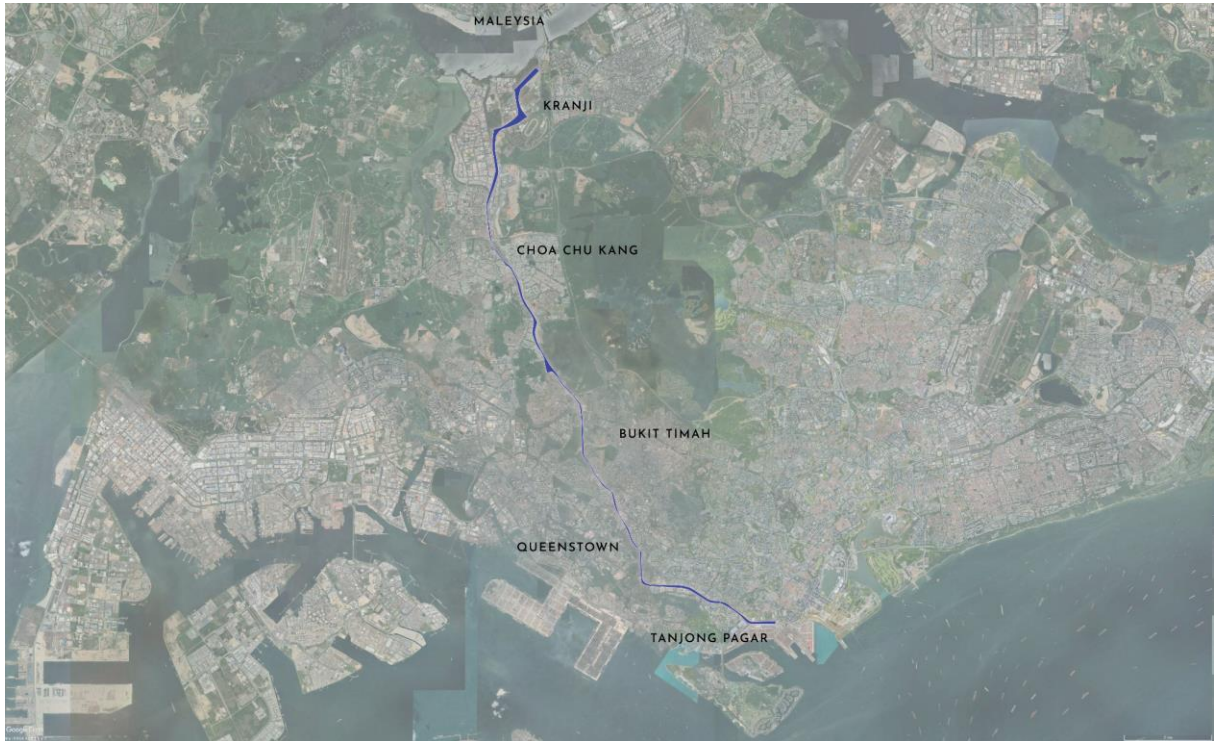


Figure 13. Location of the corridor (Improved by author).

The 24km railway line started operating in 1903 to connect Singapore to Malaysia. It traverses through Singapore's natural environments, making it known as the "Green Corridor." The railway was abandoned in 2011 due to new modes of transport and openings of other rail lines.

The government had a vision to turn the corridor into Singapore's version of High Line with the entire linear public space being used to link and regenerate the surrounding districts while also providing valuable green space. A competition was announced which included 3 parts; the masterplan and design of the railway corridor, the affordable housing project in Choa Chu Kang, and the renovation of Tanjong Pagar train station [45]. The selected proposal incorporates green space, walking paths, and cycling paths, as well as the development of the surrounding area over the next few years, ensuring that the entire old train line is well integrated into the surrounding environment.

The design includes green spaces along the canal, providing social places where locals can rest and interact with the water along the flood plains. Residential towers are connected through elevated decks over the forest textures. The ultimate goal is to establish a "seamless connectivity" that allows users to feel the emotional, functional, and experiential advantages of the area's rich past and ecosystem. It emphasizes the community-centered experience via the construction of new affordable housing [46].

3.9 Parco Lineare



Figure 14. Location of the corridor (Improved by author).

Built between the 1920s and 1930s on the historical railroad that was connecting Dittaino-Piazza Armerina to the UNESCO heritage town of Caltagirone and provided service until 1971. A section of the railway is part of Salvatorello, an 8-km-long greenway which was the first example of such an intervention [47]. The site was abandoned because of the frequent landslides and the disruption from the inclusion of short stretches within cultivated fields [48].

Project is one the first examples in Sicily to initiate the reuse of old railway sites with the establishment of recreational and cultural activities and characterized by the challenging orography, agricultural and historical landscapes, and environmental recovery. The design idea was to transform the “equipped nature trail” into a “light infrastructure” as a linear park that is formed by different widths along the corridor. The rail tracks are not visible, however, a dominant-coloured paving on the former railway line draws a cycle path that characterises the project which is referred as “linear cycle park” in some sources [49]. The park is currently in a condition of neglect and vandalism, probably due to maintenance and the lack of daily use of the park which might be a problem for the budget needed for future phases [50].

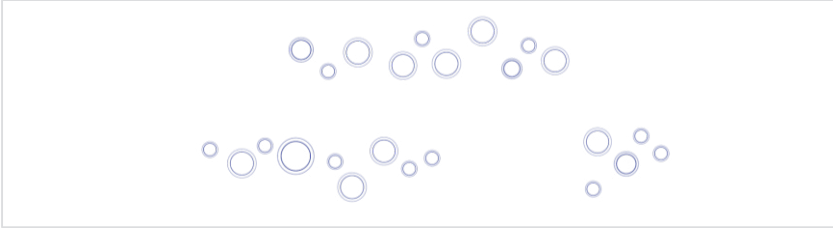
4. POST-INDUSTRIAL RAILWAY LANDSCAPES DESIGN STATEMENT

4.1 Railway Landscape Features

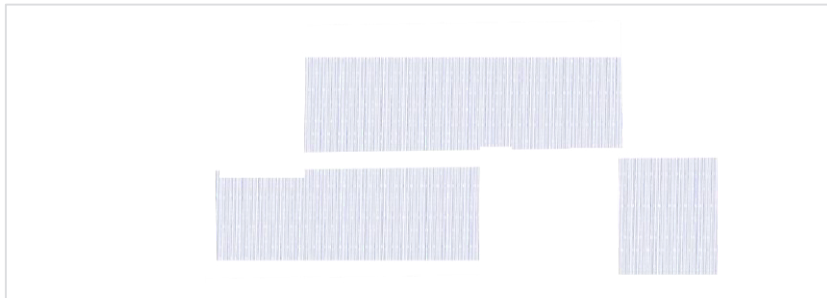
Railway landscapes consist of 3 elements which are lines, points and areas.



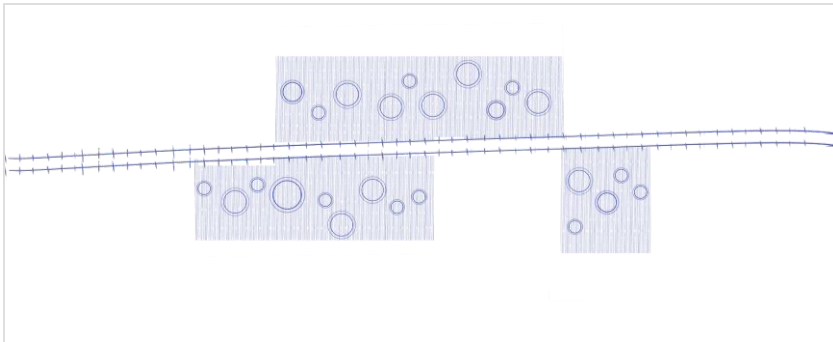
Lines: Rail tracks can be represented as lines.



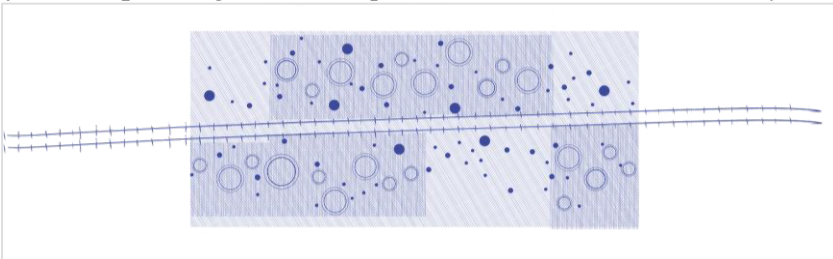
Points: Stations or other vertical elements can be represented as points.



Areas: Railyards and related multiple points can be represented as surfaces.



Railway landscapes: Together; lines, points, and areas constitute railway landscapes.



Transformation of railway landscapes: New nodes are developed by users and designers in the process of transformation.

4.2 Design Principles

1. Community Involvement

Designers and officials should create a platform to hear the community before initiating a regeneration of an abandoned railway site. The project cannot properly answer the needs without community involvement. Non-profit organizations put up tremendous effort in these areas, both in launching initiatives and maintaining them, in terms of budgeting and future growth. They provide the media to communicate with locals and their needs as seen in most of the case studies. It is nearly difficult to fail once the community, stakeholders, and project designers work together to alter the place in the best possible way. There is a sense of belonging provided to locals through their involvement in the process which helps engage users, detecting the requirements with a diverse variety of opinions from individuals near to the project as well as connecting diverse communities. We see the success of community involvement in many cases such as the High Line which was an amazing collaboration between authorities, community, and the non-profit organizations.

Competitions for design approach

Competitions are an indirect way to reach community opinion because the entry teams provide research on the area before presenting their design in which we can see surveys with local residents. This is a good strategy towards an adequate proposal for the site and its users.

2. Natural Process As A Design Form – Ecological Compensation

Reclamation

The first thing that needs to be dealt with is the residuals of the previous industrial activity as in all brownfield transformation projects. We have seen in the case studies that the post-industrial site has already been reclaimed by nature, with wild vegetation growing on the train tracks, generating spectacular images that drew the attention. In some ways, this scenario was a wake-up call. This does not, however, imply that we may invite users to the area immediately. Before taking any action, a reclamation project should be completed to remove the toxic substances from the soil. Several techniques are being used currently for the decontamination of the polluted soil such as phytoremediation which is a part of bioremediation techniques.

We see an exceptional planting design in the High Line case. Pier Oudolf teaches us the dynamism of landscape through his design with its perfectly examined daily, seasonal and yearly changes. In Parque Lineal Ferrocarril de Cuernavaca, the natural process as an input provides the solution to the water crisis through the design of an urban forest.

Natural process as a design form

Landscape design is a dynamic field of study that changes through time and space. Hence as landscape architects, we design the process rather than the state of the place. Considering the changes, we should be able to propose a process design that considers all the phases. The elements that show these changes are obviously the vegetation which changes the scale, texture, colour and even the function of the space through time. We may notice these results as a result of ecological succession. Hence, the selection of vegetation plays an important role.

3. Heritage And History

Post-industrial sites present both intangible and tangible heritage in different forms. Railway lines, for example, reflect previous traces, societal mobility, and the link between two destinations, whilst stations represent the spots where people welcome their loved ones across distances. The linearity depicts the panoramic view of the scenery that the traveller enjoys as they go across yards. Thousands of memories are formed along these linear structures. More importantly, these sites encompass the industrial development through new modes of transportation as well as the evolution of society through

new technologies. Hence, it is crucial to be able to tell the story of the past through the design when regenerating a railway landscape.

Railway tracks

Railway tracks are the most distinguishing features of the railway landscape from other post-industrial landscape typologies. Their linear form is the demonstration of the past traces. It is important to re-use these valuable heritage infrastructures, which are occasionally demolished due to municipal decisions. We see in the case of High Line and Parque Lineal Ferrocarril de Cuernavaca that the tracks inspired the form of the design. High Line highlights them by forming a pattern out of their arrangement that shapes the sitting elements, whereas Parque Lineal Ferrocarril employs paint to extend the lines throughout the project and emphasize them.

Architectural elements

Architectural elements are the most visible heritage structures thanks to their vertical form and being at eye level. The stations, in particular, with their historical decorations and structures, depict the architectural era of the time and provide re-using opportunities for the transformation to help meet the site's contemporary demands. We see the renovation of the railway station in the case of Lines of Life Singapore. Although in most other cases the stations are demolished, other structural elements such as viaducts are kept waiting to provide habitat to new usage as in Promenade Plantée. In Scalo Porta Romana, the Squadra Rialzo building, the maintenance building of the former railway is proposed to be restored to its original configuration since it is the most representative element in the area from an architectural view.

The elevation of the rail tracks is also present in most popular case studies. These are arguably the structures that shape the cityscape the most. The elevation is exploited in the design of the High Line and the 606 The Bloomingdale by making the most of the views it offers. Although they don't present a high architectural background as in Viaduc des Arts in Promenade Plantée, they make the projects appealing.

Railyards

Rail yards represent a large cover of urban soil used for the maintenance and support systems of the railway operations. They may or may not contain rail tracks. The buildings on these railyards largely lack architectural design hence they are of little historical significance. However, the railyards continue living in different forms and they might be the areas with the most potential because of the large scale. We see a good example of the commemoration of history in Promenade Plantée. In this project, the railway's former maintenance yard is now hosting the Jardin de Reuilly which is one of the landmark destinations along the site. In other cases, there is not a significant example of an area representing a historical function, however, the mobility action is being represented along the trails.

4. Adaptability - Ability To Answer The Changing Needs

Adaptability is very important for the transformation of former railway landscapes because when the function of a place changes, the existing elements provide material for the re-use strategies to adjust the current needs of the site. This way, the old materials continue living in other forms to accommodate new users while saving budget on new material production. Adaptability makes the features of the site more resistant to change. In certain ways, the adaptable design preserves the features and helps in their survival while the environment changes and evolves.

All the case studies have adaptive design approaches while some have more flexibility than others. The High Line continues to grow and improve to adapt to the contemporary requirements. The Promenade Plantée promises future expansions and highlights its concept of "anticipating the city". The event venues that can accommodate variety of activities in the 606 Bloomingdale Trail, and also in Atlanta

BeltLine, the interim use in Scalo Porta Romana and the 24/7 use along with short- and long-term strategies of Parque Lineal Ferrocarril de Cuernavaca to answer metropolitan demands are just a few of the highlights we can learn from the case studies. All in all, they all propose a process design which offers different scenarios to answer the changing demands of the users through time.

5. Sustainability

All landscape architectural projects must be sustainable, not only environmentally, but also socially and economically. Because the environment continues to change and evolve, and the landscapes we construct will do the same. We must ensure that it achieves so without imposing excessive requirements.

Ecological sustainability

Ecological sustainability lies in the relationship between humans and nature. When designing a former railway landscape, we should use existing species to create the flora, prioritize endemic species, and mimic nature to assist environment deliver ecosystem services. This includes the amount of space allocated to plants as well as a thorough examination of the soil to determine the effects of previous railway activities. Shrubs and herbs should be used in combination with wildflowers to create a low-maintenance arrangement. To achieve the best ecological sustainability, species should be chosen based on their climate and water/soil requirements. Aside from the planting design, a balance of hardscape and softscape materials should be employed to create permeable surfaces that make use of the environment.

Social sustainability

Social sustainability means creating liveable environments to achieve the greater goal of creating healthy, equal, and just cities. This type of sustainability is the least discussed, yet it is just as crucial as the others. Affordable housing, educational development, mental health support, safe and secure places for current and future generations are just a few of the acts that ensure social sustainability.

Economical sustainability

Economical sustainability works together with ecological and social sustainability. The actions mentioned earlier such as picking low-maintenance plants, are also aligned with economic sustainability because the cost will be reduced by doing so. However, economic sustainability entails much more. It entails assisting the socioeconomic development of the communities with whom the site is associated as well as ensuring long-term economic progress. It covers energy efficiency, re-use methods, increasing the use of renewable energy sources, minimizing waste, affordability, assisting in the stabilization of costs, and finally producing self-sufficient, minimum-waste landscapes.

6. Integration of Users

The transformation of a space into a place is determined by its users. They are the essential component of place-making practices. Hence, engaging users is a crucial part of the process design for the transformation project. The new function provides attractiveness for the place, however, since the abandonment phase of the site creates an unsafe habitat that lacks security, the target group might need to be convinced beforehand. To do so, we should take advantage of the construction process by mapping out areas to be developed in phases in order to communicate with different target groups.

Phases

Construction of a landscape architecture project requires years to be completed. This is a considerable amount of time to be wasted. Hence, a timeline of construction should be developed, mapping out areas to build in early, middle, and late stages and the opening to public should be in multiple phases.

Each phase contributes to the success of the next because user's interactions with project features provide the best outputs for the following phases. It will serve as a test run to assess what works and what does not in the design, allowing users to provide direct input. It is, in a sense, including users in the decision-making process, which will help increase their connection to the site.

Meanwhile uses

Meanwhile uses is also another strategy to take advantage of the construction process. It is a way to activate the site before the construction is completed. This strategy proposes pop-up areas such as cafes, playgrounds, event areas to use the sites' unconstructed parts temporarily to engage with users. It benefits both the local community and the project's budget since they can include small businesses. It targets everyday visitors, individuals passing by, and people looking for night-time activities. Additionally, the visitors can follow the evolution of the project, experiencing the growth of vegetation and being imposed to the image of the site in early stages.

7. Perception – Experience of the User

The transformation of a former railway site includes negligence. These places are often neglected and forgotten, and are in poor condition throughout their abandoned stages, waiting to be discovered and used by the community. Hence, transforming them gives the community a new perspective on the site. In some cases, the community has realized the value of these places and has claimed them, urging towns and authorities to take action. And in some cases, the site's value is realized by the municipality. In any case, the design of transformation altered how these sites were seen. Perception is created by highlighting the historical layers, the past traces and its relation with the community. In addition, renovating the harmed features provides the storytelling that was not obvious to the visitor before the transformation. Using the existing structures is a strategy to elevate the visitor's experience of their own city, creating new meeting places, activity areas, framing views in a way that the locals have not experienced before. These sites should reflect the co-existence that was discussed in the chapter "Barrier or Connector", how we live together and the combination of human-made and natural world.

All the case studies provide new views to the visitors and change their perception of both the city and the site. Visitors interact with industrial residuals in a way that they have not been able to interact before. While some of them have a bigger effect than others maybe because of the elevation they provide, others find ways to impress visitors with other characteristics. High Line, Promenade Plantée, Scalo Porta Romana, the 606 Bloomingdale Trail create different perceptions through a combination of elevation and ground level views while others recommend a range of activities, some of which are unique to the neighbourhood and others that are adaptable enough to meet changing demands.

8. Mobility, Movement and Flow

We cannot talk about railway landscapes without talking about mobility, since they were once the major transportation providers in history. Even the linear form of them represents the movement. Symbolizing this in the site as well as re-using this functionality to adapt to new conditions. Railways were designed to connect places and they should continue to do so. While some projects employ this as a design aspect, others, such as Rails to Trails initiatives, use it as the entire idea. Making former railway landscapes a mode of transportation as a part of the "slow mobility network" appeals government funding since it aligns with municipal vision plans' sustainable transportation aims while also poetically enabling the sites retain their historical purpose as connectors.

The city's other transportation networks are normally connected to the railway stations; however, after the transformation of the abandoned sites, new access points along the corridors should be established, as well as linking these access points to various stops of other modes of transportation.

Finally, the site should be connected to other open spaces in the city through mobility links in order to establish a network of open spaces. This will activate the site by creating connections towards the city's other amenities.

The selected case studies have different designs to create a cycling route that can be a part of the slow mobility network of the city that we can learn from. For instance, the 606 Bloomingdale Trail works with the government to increase mobility. The slow mobility strategies are more dominant in this project compared to the other 10 projects.

The increased access points help the mobility by connecting the site to different modes of transportation. High Line and Promenade Plantée are exceptionally accessible which adds to their success.

Atlanta BeltLine connects 45 neighbourhoods which did not have a particular relationship before the project. Hence, we can say that the transformation of the abandoned railway landscapes into public places improves the mobility between neighbouring communities as the corridor does not only link the two ends but also the neighbourhoods it passes through.

5. CONCLUSION

Abandoned railway landscapes are special because generally they are very integrated to the urban fabric and they are characteristic in terms of their linear form and the way they allow us to see the exact traces of the past movements through the rail tracks. In this way, they differ from other typologies such as airports and ports and the number of disused railways is too high to ignore. The thesis demonstrates the enormous potential of these areas to be part of the city's open space network.

The outcomes of this research are the categorization of industrial landscapes in a function-based perspective and a design statement of abandoned railways created from the analysis of process designs in best practices which were presented in the case studies. The accumulated knowledge of research and practice examination provided the base for the design statement.

Our work as researchers is based on the combination of design practices and theory. Hence, technical details are not included in this study. Additionally, since landscape architecture is a dynamic discipline that evolves across time and space; rather than suggesting particular actions, principles are presented in the design statement which covers a variety of examples and highlights from chosen case studies to be interpreted as design approaches and be adapted to any abandoned railway site. In order to answer to a wide range of target groups such as researchers, designers, planners and authorities, the design statement has an extensive form of principles.

The examination of best practices yielded 8 principles that should be followed in order to create the greatest potential regeneration. These are community involvement, natural process as a design form, history and heritage, adaptive design, sustainability and management, perception of users, integration of users and the mobility both as historical function and as the accessibility of today. The thesis' findings can inspire landscape architects, academics, and educators, as well as help interested parties extend their perspectives by providing the cumulative knowledge on the issue.

The research findings show that finance is the criticality of the whole transformation process. Some suggestions are presented in the design statement in order to find the budget such as community involvement together with stakeholders and integrating the site with the slow mobility network of the city for which the ministry of transport might propose funding; however even if the budget is found for current construction, daily operations and maintenance require continuous funding. The sustainability principle recommends various measures that can be performed in order to create a low-maintenance landscape, however considering the scale of the projects such as High Line or the 606 Blooming Trail, which are known for their high costs, we cannot really talk about small-budget projects. Hence, further research on budget and financing stability is urged, as it will aid authorities in understanding the needed politics and metrics.

REFERENCES

- [1] **Couch, C. & Leontidou, L. & Petschel-Held, G. (2007).** *Urban Sprawl in Europe Landscapes, Land-Use Change & Policy.* Blackwell Publishing.
- [2] **Waldheim, C. (2016).** *Landscape as Urbanism.* Princeton University Press.
- [3] **URL-1. (n.d.).** On the development of Industrial Landscapes. ERIH [European Route of Industrial Heritage] Last accessed March 12, 2022 <https://www.erih.net/how-it-started/history-of-industries/industrial-landscapes/>
- [4] **Braae, E. (2015).** *Beauty Redeemed: On Recycling Ruinous Industrial Landscapes.* Ikaros press.
- [5] **Strang, G.L. (1996)** *Infrastructure as Landscape [Infrastructure as Landscape, Landscape as Infrastructure].* *Places*, 10(3): 8.
- [6] **Nijhuis, S. & Jauslin D. (2015).** *Urban Landscape Infrastructures: Designing Operative Landscape Structures for The Built Environment.*
- [7] (n.d.) *Brownfields.* EPA [Environmental Protection Agency]. Retrieved March 27, 2022 from <https://www.epa.gov/brownfields>
- [8] **URL-2. (2006).** *Train Stations as Places for Community Wellbeing.* Retrieved. Village Well. March 28, 2022 from https://www.vichealth.vic.gov.au/~media/programsandprojects/publications/attachments/train_stations_community_wellbeing2.ashx
- [9] (2021) *Bicentennial Edition: Historical Statistics of the United States, Colonial Times to 1970.* US Census Bureau.
- [10] **Beria, P. (2016).** *Atlante dei Trasporti Italiani,* Politecnico di Milano.
- [11] **Rovelli et al. (2006).** Analysis and evaluation of abandoned railways aimed at greenway conversion: A methodological application in the Sicilian landscape using multi-criteria analysis and geographical information system.
- [12] **Sarmento, J. (2022).** *The Geography of ‘disused’ railways: what is happening in Portugal?*
- [13] **Radovanac, M. & Stanojlovic, A. (2018).** *New Possibilities for Utilising Abandoned Railway Infrastructure.* National Workshop on the implementation of the European Landscape Convention in Bosnia and Herzegovina.
- [14] **Julius Gorys et al. (1993).** *The Acquisition of Abandoned Railway Rights of Way.* International Right of Way Association.
- [15] **URL-3. (n.d.).** REVER MED. European Greenways Association. Retrieved May 30, 2022 from <https://www.aevv-egwa.org/projects/rever/>
- [16] **URL-4. (n.d.).** *Scali Ferroviario Accordo di Programma.* Official Website of Comune di Milano. Retrieved May 30, 2022 from <https://www.comune.milano.it/aree-tematiche/rigenerazione-urbana-e-urbanistica/attuazione-pgt/adp-scali-accordo-di-programma>
- [17] **Ruocco, G. et al. (2017).** *Sustainable reuse of disused railway.*
- [18] **Geroldi, C. (2009).** *Misfit agriculture and urban decontaminations.*
- [19] **URL-5. (n.d.).** *History. The High Line.* Retrieved April 14, 2022 from <https://www.thehighline.org/history/>
- [20] **Velde, R. (2018).** *Transformation in Composition – PhD Defense at TU Delft.*
- [21] **URL-6** **Gopnik, A. (2001).** *A Walk on the High Line.* Retrieved April 14, 2022 from <https://www.newyorker.com/magazine/2001/05/21/a-walk-on-the-high-line>
- [22] **URL-7. (n.d.).** *High Line Construction. Case Consortium | Columbia CTL.* Retrieved April 22, 2022 from https://ccnmtl.columbia.edu/projects/caseconsortium/casestudies/128/casestudy/www/layout/case_id_128_id_903.html
- [23] **URL-8.** **Falk, T. (2011).** Retrieved April 22, 2022 from <https://www.zdnet.com/article/high-line-park-attracts-2-billion-in-new-developments-other-cities-follow/>
- [24] **URL-9.** **Daul, Kimberly. (n.d.).** *Promenade Plantée.* Britannica. Retrieved May 28, 2022 from <https://www.britannica.com/place/Promenade-Plantee>
- [25] **Heathcott, J. (2013).** *The Promenade Plantée: Politics, Planning, and Urban Design in Post Industrial Paris.* *Journal of Planning Education and Research*, 33(3), 280–291. <https://doi.org/10.1177/0739456x13487927>
- [26] **Meade, M. (1996).** “Parisian Promenade.” *The Architectural Review* September, 52–55.

- [27] **Hayden, D. (1997).** *The Power of Place: Urban Landscapes as Public History.* Cambridge, MA: MIT Press.
- [28] **Marvillet, J. (2006).** *Vingt ans d'urbanisme amoureux à Paris: 1982-2001.* Paris: L'Harmattan.
- [29] **URL-10.** (n.d.). *Linear Park Cuernavaca.* Urban Next. Retrieved May 29, 2022 from <https://urbannext.net/linear-park-cuernavaca/>
- [30] **URL-11.** Mccord, H. (2021). *A Sinking, Thirsty City: The Water Crisis in Mexico City.* Latin America Reports. Retrieved May 29, 2022 from <https://latinamericareports.com/a-sinking-thirsty-city-the-water-crisis-in-mexico-city/6075/#:~:text=Mexico%20continues%20to%20experience%20one,percentage%20points%20below%20normal%20levels>
- [31] **URL-12.** (2018). *Parque Lineal Ferrocarril de Cuernavaca - 10a Biennial 2018.* Official Website of Barcelona International Biennial of Landscape Architecture. Retrieved May 29, 2022 from <https://www.arquitectes.cat/iframes/paisatge/fitxa/10106>
- [32] **URL-13.** (n.d.). *Masterplan "Parco Romana".* Official website of Gruppo Ferrovie dello Stato Italiane. Retrieved May 29, 2022 from <https://www.fssistemiurbani.it/content/fssistemiurbani/it/scalimilano/masterplan--parco-romana-.html#0>
- [33] **URL-14.** (2021). *Urbanistica, Scalo di Porta Romana, il team guidato da OUTCOMIST con il progetto Parco Romana vince il bando per il masterplan preliminare di rigenerazione urbana.* Official Website of Comune di Milano. Retrieved May 29, 2022 from <https://www.comune.milano.it/-/urbanistica.-scalo-di-porta-romana-il-team-guidato-da-outcomist-con-il-progetto-parco-romana-vince-il-bando-per-il-masterplan-preliminare-di-rigenerazione-urbana>
- [34] **URL-15.** (2021). *Parco Romana.* LAND Srl [Official website of the firm]. Retrieved May 29, 2022 from <https://www.landsrl.com/portfolio-land/2021/parco-romana>
- [35] **URL-16.** (n.d.). *Il Progetto Parco Romana. Scalo Di Porta Romana* [Official website of the project]. Retrieved May 29, 2022 from <https://scaloportaromana.com/il-progetto/parco-romana>
- [36] Guernieri, M et al. (2020) *The future of the Porta Romana railway area in Milan.* Domusweb.
- [37] **URL-17.** (n.d.). *Atlanta BeltLine.* Retrieved May 29, 2022 from <https://beltline.org/>
- [38] Van Mead, N. (2018). *A city cursed by sprawl: can the BeltLine save Atlanta?* The Guardian.
- [39] **URL-17.** (2020). *Leaders say Atlanta BeltLine must not become part of 'infrastructural racism'.* Reporter Newspapers & Atlanta Intown. Retrieved May 29, 2022 from <https://reporternewspapers.net/2020/06/05/leaders-say-atlanta-beltline-must-not-become-part-of-infrastructural-racism/>
- [40] **URL-19.** Green, J. (2017). *Atlanta Beltline CEO Paul Morris is out after four years.* Atlanta Curbed. Retrieved May 29, 2022 from <https://atlanta.curbed.com/2017/8/23/16190462/atlanta-beltline-ceo-paul-morris-steps-down-after-four-years>
- [41] **URL-20.** (n.d.). *The 606.* Retrieved May 30, 2022 from <https://www.the606.org/>
- [42] **URL-21.** (n.d.). *What is the 606 park?* Chicago Architecture Center. Retrieved May 30, 2022 from <https://www.architecture.org/news/chicagos-playscapes/what-is-the-606-park/>
- [43] **URL-22.** (n.d.). *Reiulf Ramstad Arkitekter, Parenthèse Paysage Portes Bonheur – Le Chemin Des Carrières.* Divisare Atlas of Architecture. Retrieved May 30, 2022 from <https://divisare.com/projects/418125-reiulf-ramstad-arkitekter-parenthese-paysage-11h45-portes-bonheur-le-chemin-des-carrieres>
- [44] **URL-23.** Wang, L. (2019). *A forgotten railway takes on new life as a new cultural destination in France.* Inhabitat. Retrieved May 30, 2022 from <https://inhabitat.com/a-forgotten-railway-takes-on-new-life-as-a-new-cultural-destination-in-france/>
- [45] **URL-24.** (2015). *Archdaily China: China's native landscape beats big names such as OMA to design Singapore's version of the High Line.* Turenscape. Retrieved May 30, 2022 from <https://www.turenscape.com/news/detail/1786.html>
- [46] **URL-25.** Oh, E. (n.d.). *MKPL Architects Wins Two Projects in Singapore Rail Corridor Competition.* Archdaily. Retrieved May 30, 2022 from <https://www.archdaily.com/777200/mkpl-architects-wins-two-projects-in-singapore-rail-corridor-competition>
- [47] (2017). *Atlante di viaggio lungo le ferrovie dismesse.* Gruppo FS.
- [48] **URL-26.** (n.d.). *Ferrovia Dittaino - Caltagirone (vecchia).* Retrieved June 18, 2022 from https://www.ferrovieabbandonate.it/linea_dismessa.php?id=13

[49] **URL-27.** (n.d.). W006_PARCO LINEARE_99. Studio Nowa [Official website of the firm]. Retrieved June 18, 2022 from http://www.studionowa.com/english/in_project/pro/parco/parco.html

[50] **URL-28.** (n.d.). Linear Park. Architectuul. Retrieved June 18, 2022 from <https://architectuul.com/architecture/linear-park>

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Revitalizing Famagusta's Historical Urban Spaces to Promote Student Leisure time: a Case Study



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Abstract: *Individuals commonly congregate in various locations, such as urban public spaces, to engage in leisure activities. The preservation and revitalization of these public spaces, particularly those with historical significance, are primarily geared towards accommodating tourists. That's why in the seasons or times that the number of visitors decreases, these areas became empty of life and livability. Therefore, in addition to the tourists, these places need some revitalization to encourage and attract local people and younger generations to use them. In the historical city of Famagusta, there are lots of historic urban spaces that being used for tourist attractions, but in spite of the high population of young people, which most of them are students, they don't spend their leisure time in this historic part. These urban spaces can become popular and alive again if people start to use them. the purpose of the present research is to find important factors and priorities of students to provide some solutions for revitalizing Namik Kemal Meydanı in the historic part of Famagusta. By considering the negative points and solutions from the viewpoint of the students and young generation, the data were collected through interview and questionnaires and review and analysis of library sources. According to the obtained results, revitalization is not successful by just attention to tourist's demands and there are some important problems that can easily be resolved for the aim of encouraging the students to spend their time in this part of the city and therefore, obtaining a complete and comprehensive revitalization.*

Keywords: *Revitalization, historic urban, urban conservation, urban management, Northern-Cyprus*

Gazimağusa'nın Tarihi Kentsel Alanlarını Öğrencilerin Boş Zamanlarını Teşvik Etmek İçin Canlandırılması: Bir Alan Çalışması

Özet: Bireyler genellikle boş zaman faaliyetlerinde bulunmak için kentsel kamusal alanlar gibi çeşitli yerlerde toplanırlar. Bu kamusal alanların, özellikle de tarihi öneme sahip olanların korunması ve yeniden canlandırılması öncelikle turistleri ağırlamaya yöneliktir. Bu nedenle ziyaretçi sayısının azaldığı mevsimlerde veya zamanlarda bu alanlar yaşamdan ve yaşanabilirlikten yoksun hale gelmektedir. Bu nedenle, turistlerin yanı sıra yerel halkın ve genç nesillerin de buraları kullanmasını teşvik etmek ve çekmek için bu yerlerin yeniden canlandırılması gerekmektedir. Gazimağusa tarihi kentinde, turistik cazibe merkezi olarak kullanılan çok sayıda tarihi kentsel alan bulunmaktadır, ancak çoğunluğunu öğrencilerin oluşturduğu yüksek genç nüfusuna rağmen, boş zamanlarını bu tarihi bölgelerde geçirmemektedirler. Bu araştırmanın amacı, Gazimağusa'nın tarihi bölgesindeki Namik Kemal Meydanı'nın yeniden canlandırılması için bazı çözümler sunmak üzere öğrencilerin önemli faktörlerini ve önceliklerini bulmaktır. Öğrencilerin ve genç neslin bakış açısından olumsuz noktalar ve çözüm önerileri göz önünde bulundurularak, veriler mülakat ve anketler ile kütüphane kaynaklarının incelenmesi ve analizi yoluyla toplanmıştır. Elde edilen sonuçlara göre, yeniden canlandırma sadece turistlerin taleplerini dikkate alarak başarılı olamamaktadır ve öğrencilerin zamanlarını şehrin bu bölümünde geçirmelerini teşvik etmek ve böylece tam ve kapsamlı bir yeniden canlandırma elde etmek amacıyla kolayca çözülebilecek bazı önemli sorunlar vardır.

Anahtar Kelimeler: Yeniden canlandırma, tarihi kent, kentsel koruma, kentsel yönetim, Kuzey Kıbrıs

1. INTRODUCTION

There are some parts in every city known as historical and cultural signs of the city, they are often considered as the primary part of the beauty aspect and tourist attraction of the cities, and their visual qualities and functions are critical for the identity of the city [1]. The historic environment refers to all the physical evidences of the human life and activity in the past. Such areas are built during hundreds and thousands of years and it is evident for everybody that they bear important values. These areas are dynamic and changing every day. At one hand, they cover a wide range of places including the buried sites to historic monuments, natural objects like shores and mountains, fields and etc. On the other hand, it is something in which we live and spend our time, both mentally and physically.

It is complex, relying on buildings and sites that they are physical remains but their emotional and aesthetic are on the authority of history and memory [2]. Aesthetic aspect of the past time is simply appreciable and bears high value due to their own sake. Historic buildings and areas are beautiful and antique, simply because they possess a scarcity value.

Despite of the significant value of fabric in the spatial and functional structure of the city and their potentials and strength points, some problems and limitations have been indicated same as inconsistency of the frame and the reality, existence of urban inconsistent elements, incompatible traffic absorbent usages, the left unprotected spaces, no vitality and attractively; all these factors lead to lose the importance and value of the old fabric of the cities and population displacement and consequently departure of the groups with high affordability [3].

Earlier policies for conservations normally begin with simple concerns of “preservation” to a progressive concern for “revitalization” [1]. Revitalization as a response to tourism demands refers to reduce conservation to chosen history and only some physical aspects remain, same as packaged products for sell [4].

2. PROBLEM

Touristic zones of the historic areas in some cities are alive and vital only during the seasons that tourists come and the weather is good. In spite of their attraction in other times of the day and other seasons, these places become empty from normal life, population, vitality and social interactions. Therefore, these valuable areas become worthless for people particularly new generations and this will damage them and maybe encourage owners to destroy and construct new buildings. In this way, the cities will lose their identity, history and culture over time.

2.1 Research Problem

There are many various types of research about the revitalization of historic urban spaces, almost all of them focus on tourists and their demands, and there isn't enough research about demands of locals, students, and youth generation, and their important function in revitalization. Therefore, these valuable areas aren't used as they deserve. In addition, in some cities with a high percentage of students like Famagusta, this issue will be more important.

3. RESEARCH OBJECTIVES

The present research with the aim of encouraging students and youths to spend their time in historic parts of the city tried to

- Understand the factors that are important to encourage students and young people to take advantage of the historic urban spaces in their free time.
- Define priority and importance of the factors. -know the reasons that historic and valuable parts of Famagusta city in spite of their advantages aren't popular as they deserve.

-Reach to better and more comprehensive definition for revitalization Therefore, the focus of the present paper is on defining the factors that are most important for students and their priority in order to obtain a comprehensive revitalization.

4. METHODOLOGY

The present study is a qualitative research based on a field study. It utilizes surveys (questionnaires and interviews) and employs phenomenological research methods to analyze data gathered from the conceptions of students. In addition, the study also incorporates the use of library sources.

The data were collected in three stages: documentary analysis, interviews, and questionnaires. These data were gathered from graduate students in the Faculty of Architecture and Urban Design at Eastern Mediterranean University. This particular group was chosen because they possess valuable insights and perspectives on urban and architectural subjects.

A total number of graduate students are 300. 7 interviews (more than 2%) and 60 questionnaires (1/5 of population) were conducted on a random basis.

First by using from documents and library sources, to select and categorize the phrases, to know the theories and experience of the other countries and opinions of urban designers and professionals.

Second, through the interview with graduate students of architecture faculty.

Third, by questionnaires that were prepared based on the results obtained from the interviews and scientific theories from documents and literature review. The questions were designed on a Rating 4 Scale and closed format. In order to determine the importance and priority of the factors.

For explain results and analysis factors were used from coding and selecting and categorizing phrases and for presentation of results used from graphs and explanations.

The field study of the present research is limited to the historic part of Famagusta (walled city), Namik Kemal Meydanı. This area is known as an urban space with good quality in comparing to the new parts of the city. This area is alive during tourist seasons at specific times, but in other times and seasons, except in some events, it becomes empty. People and students don't spend their free time in such parts of the city and that's why this good urban space isn't lively and full of people as it deserves to be.

5. INTRODUCING THE FIELD OF STUDY

The study primarily centers around the historical urban area of Famagusta. Despite the presence of well-designed urban spaces, public areas, picturesque sights, and pedestrian-friendly pathways within the walled city (refer to Figure 1), it is observed that youth and students rarely utilize this particular section of the city.

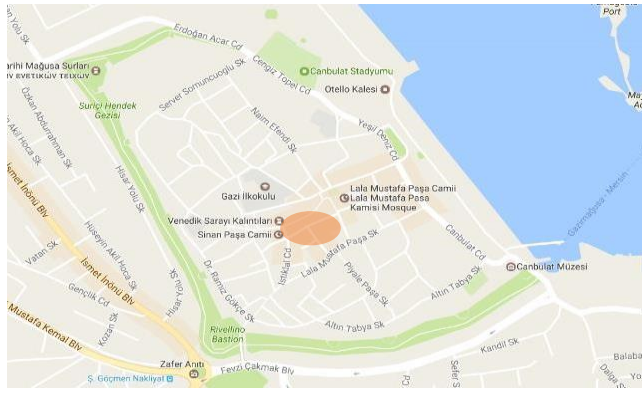


Figure 1. Wwalled city and field study. source: google map

Universities and higher research institutions have been subject to extensive academic study due to their substantial regional impacts [13]. In Famagusta, a significant number of students and local residents tend to spend their time in newer areas, despite the lack of adequate public spaces, parks, urban furniture, or pedestrian pathways. Given that students make up approximately half of the population in Famagusta, they play a crucial role in this research and are considered a pivotal factor in examining the issue.

Among all of the urban spaces that are created during different periods of time in various cities, urban squares are more important and placed in the center of attraction of people. These squares became empty after the industrial revolution [5] or under ideal conditions, they only transfer the feeling of a museum.

Regarding to the sources and history, the population in walled city is too few and the people currently residing in the walled city are mostly people with less choices, the population is about 2.250, while in the sixteenth century there were about 7000 inhabitants in this part of the city [6]. Namik Kemal Meydanı (figure 2) is the most touristic zone of the walled city. In the seasons with high number of tourists, the area is full of energy, vitality and life, but in the later times and other seasons, this valuable and beautiful urban space became empty of life and liveliness and turns to 5 ghost town.



Figure 2. Namik Kemal Meydanı, field study, Photo Taken by Author

6. IMPORTANCE OF HISTORIC URBAN ENVIRONMENT

Historical urban areas and buildings are regarded as enduring remnants of the past that continue to hold relevance in contemporary life. The widespread consensus among people and researchers globally is that these historic urban areas serve a paramount purpose in preserving the cultural and historical heritage of cities and countries [7].

Because historic zones are mostly located in the center of cities, their revitalization will become part of the whole revitalization of the cities. The value of these historic zones did not always appreciate till the 1960s. These areas were considered as a problem for development of the cities. In the 1970s, values and views to these historic parts changed and these places became conserved and protected [1].

7. CONSERVATION OF HISTORIC AREAS

The importance of conservation of historic environments is obvious from many charters that have emphasized on this matter. For example, many international bodies have emphasized on the importance of the conservation in historic centers. In 1976 UNESCO recommended that the necessary steps should be taken to ensure that the restoration and protection of historic areas and cities include development and harmonious adaptations to contemporary life of locals.

Furthermore, ICOMOS in the Washington charter states that the process of conservation of historic areas and cities should be considered as a primary part of logical and comprehensive policies in urban, economic and social designs [14] and in the international cultural tourism charter that is about managing tourism in touristic zones (1999) mentioned the relation between tourists, local people and sites. From this charter we can understand that considering locals are important as to visitors and tourists[15].

7.1 Revitalization and Conservation

The “urban revitalization” term is used in the recent literature of the world as a general term that encompasses other concepts as reformation, renovation, reconstruction, empowerment and rehabilitation. Urban revitalization is a process that leads to create new urban spaces with maintaining the basic spatial, physical and activity characteristics [8].

In the primary preservations, policies just protected individual buildings and structures, most of the buildings are national or religious buildings. In the pass of time, this protection became wider and reached to urban contexts [1].

7.2 Urban Conservation

Urban conservation refers to enhance an area that includes qualities which built from the past. It's not about preserving history as an archaeological, visiting historic areas. Similarly, it is not the same as going to a museum. These fields of conservation and relations to truism are so wide and complex [4]. At the beginning of the twenty-first century, historic preservation developed into an urban design and planning profession [9].

Urban conservation is so different from conservation of buildings. Because it is multidimensional and encompasses the whole city including the buildings, the urban patterns, roads, urban spaces and green spaces.

There are three dimensions in the conservation of urban places that should be considered: physical, spatial and social. All of them interconnect and overlap. The conservation of an historic urban environment is a multitude of projects not a separate project. The *physical* dimension is very similar to normal building conservation, focus and appearance of the old buildings. The *spatial* dimension is more related to the urban designers and planner's view. It covers the circulation and road traffic, relationships between spaces and their usage, relationship between internal and external spaces.

The third and last is *social* dimension. It relates to the users and their concerns, the local community and the people that lives in the place. This aspect is the most challenging aspect to define in compare to the physical and spatial dimensions, but arguably the most significant and important one, because continuity in comprehensive conservation can only be achieved and be succeed through the continuation of vital urban life, not only a vital urban life during the tourism seasons of place [4].

7.3 Conservation, Tourism and historical areas

Today, the interaction of both tourism and historic places is an important object in the planning and management of historic spaces. There is a kind of struggle and contact between preservation of the character of existing historic 7 cities and “change” and it is considered as an important discussion for conservation [10].

8. TOURISM IN HISTORIC AREAS

From 1980s, researchers started to understand the importance of tourism and the role of visitors as a vital and important factor in the economics of urban, the country and world. This subject become an important and major focus in studies. They started to do special studies about connection between tourism and urban economics and they showed that this matter has important role in urban form [11].

In different types of tourism, urban tourism is classified as a very important type. Despite its importance, urban tourism is still vaguely defined [12].

The relation between tourism and architecture is bidirectional. On one hand, we have architecture monuments that, due to their history, their aesthetic, their celebrity are touristic objectives. On the other hand, we have architecture in the service of tourism [17].

9. VARIABLE FACTORS AND INDICATORS IN THIS RESEARCH

After interviewing with the students, some factors were found from their answers as problems and solutions. These factors plus some important urban design factors from theories and documentaries are gathered into a questionnaire.

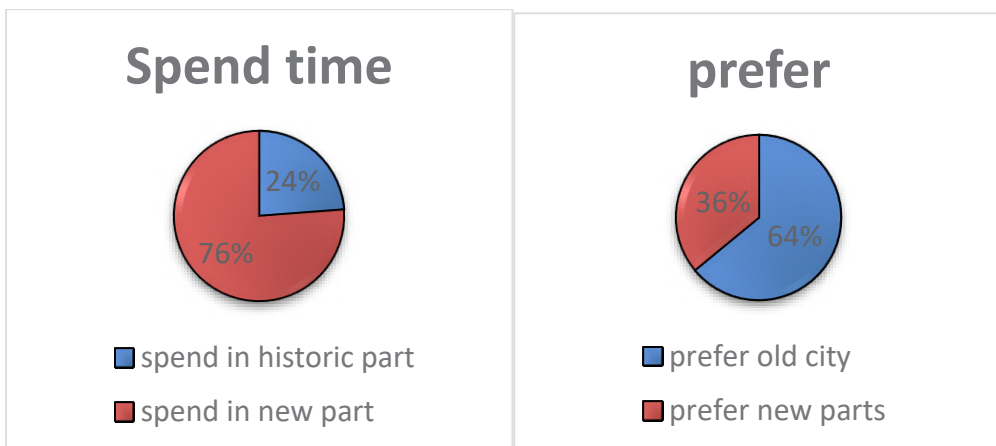


Figure 3. The percentage of students that like and prefer historic part or new parts

Figure 4. The percentage of students that spend their time in new and historic parts

The result from graphs in figures 3 and 4 show that Although 64% liked to spend their time in historic part, but due to problems 24% of them going and spending their time in historic parts.

10. INTERVIEW AND PROPOSED IDEAS FOR FIELD STUDY

Most of interviewees said that public transportation should be better. Many of them said that new restaurants, cafes, bars should be open in the old city. This is very common statements during interviews: “nobody is there” “old city is boring” and “I don’t have different choices there “

Some of the other ideas are: organizing more festivals in old city, opening new branch of universities Building dormitories, tax reduction of commercials and encouraging policies to convince them to open in late times, getting more tax from empty house and shop; and, Creating spaces for daily markets and second-hand markets.

11. THE FACTORS

These factors are obtained from the interviews and urban design theories in revitalization. Importance and priority of each of them were asked in the questionnaire. Walking ways and pedestrians, facilities (WC, Urban Furniture ...), the number of cafes, bars, restaurants, quality of café, bars and restaurants, public transportation (taxi, bus), cafes and bars prices, sense of space, food prices, shopping prices, variety of markets, car parking spaces, safety, lighting, views and architecture of buildings, urban spaces and public spaces, events and festivals.

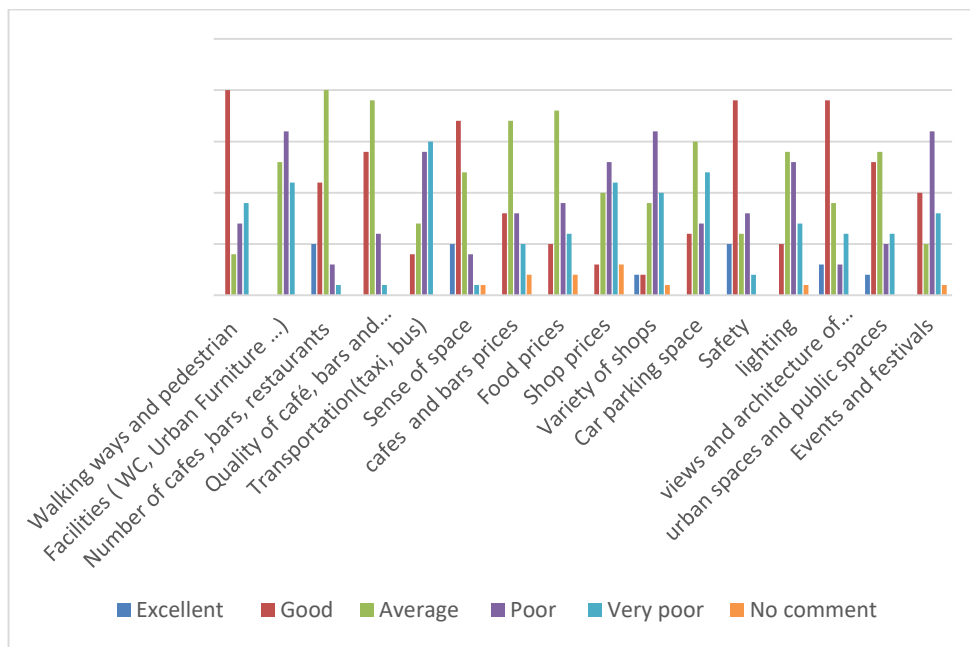


Figure 5. Graph of overall factors evaluation

In Figure 5, the comprehensive results of the questionnaires are presented. While the number of cafes, bars, and restaurants, as well as their quality and prices, did not receive negative ratings and garnered average responses, it is intriguing to observe that students who have resided in the city for a longer duration expressed lower levels of satisfaction compared to new students in these particular aspects. This suggests that the perception of satisfaction may vary depending on the length of time students have lived in the city.

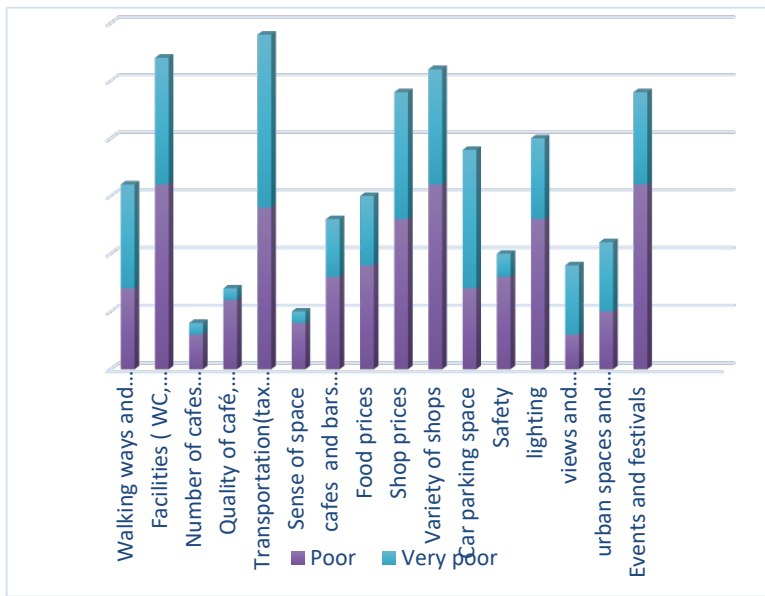


Figure 6. Graph for the Number of Poor Plus Very Poor Answers are shown

As it is shown in the Graph above (figure 6) The findings reveal that transportation emerges as the primary concern among the weak factors that students perceive as reasons for their limited visits to the historic part.

Second poor factor is facilities, that need to enhancement. Variety of the markets and prices are the next important items for attention. In Figure 7, the responses regarding excellent and good factors are depicted. The findings of the present study indicate that aspects such as the sense of place, safety, views, architecture, and walking pathways are currently perceived positively and deemed satisfactory. These elements do not require immediate attention or prioritization in terms of revitalization efforts.

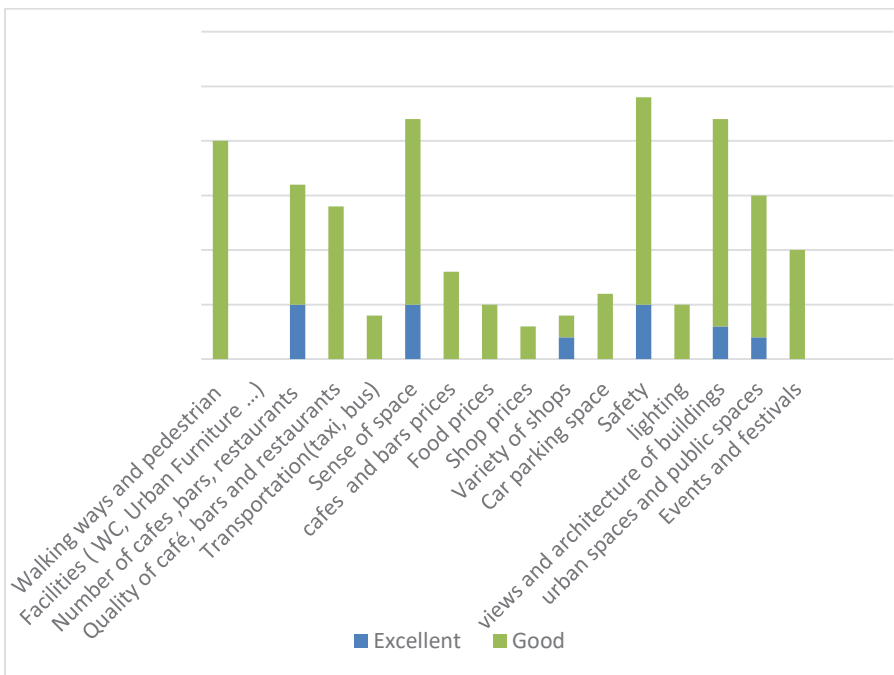


Figure 7 Graph based on satisfaction of the factor.

On the other hand, markets and shopping centers are identified as areas of weakness for both visitors and locals. These establishments lack diversity in their offerings, and prices are considerably high.

12. SUGGESTIONS

If the programmers and organizations that are working on conservation of Famagusta city pay more attention to the ICOMOS charters, as we understood, the revitalization purpose should cover locals and residents of the city, not just for Excellent Good 11 the visitors and physical urban space. This part of the city should be alive in every time of the year, not just for visitors.

A complete conservation must consider the whole time all types of users of an urban space. By continuing the current policies and eliminating the function and role of young generations, locals and the students, the value of these valuable urban areas will reduce in the minds of new generations and it isn't a sustainable conservation. We conserve these urban areas for locals, not for visitors. It is important to see the tourist as a tool for attaining better conservation and not considering them as a goal of conservation of buildings and urban spaces. According to tourism charter, paying lots of attention to tourism or poor attention both of them can be a threat for physical, integrity and character of site or building.

It is obvious that there is a need for conservation planning for walled city. Local and national governance has many limitations to action at the moment, but the NGOs can be very effective. Revitalization just for tourists will change the space and buildings to level of a product for sale [4].

According to the Valletta Principles by ICOMOS[16], development programs for tourists in historic cities should enhance the building and monuments and urban spaces and admire for residents and locals of their culture and life style. It should preserve character of environment and should follow the daily life of residents not opposite to it so if the plans decision makers just consider the demands of visitors and it's opposite to sustainable conservation.

13. CONCLUSION

One of the important purposes of the revitalization of historic urban spaces is bringing life, vitality and enhancing the quality of living in these areas. But if the programmers just consider the demands of tourists, these actions will be useless. As in low seasons that the rate of tourist is comparatively low, the place becomes empty.

In the present research, the emphasis was on students and youths and tried to evaluate the problems of a touristic part in the old city of Famagusta (Namik Kemal Meydanı) in order to know the priority factors to work on. Although this place has better conditions in compare to the new parts of the city and most of the students prefer to spend their time there, but the low percentage of them are using these areas because of lacks and problems.

Based on the obtained result, the most important problems of the students are transportation (main), facilities, the variety of markets and prices of the products.

By Considering these demands of the students that aren't very costly and difficult to be resolved, these areas could be more revitalize and alive and therefore, encourage people to even live in this parts that lead to better restoration. We should know that good urban places have a structure and 12 fundamental dynamics of activity at any time of the year.

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REFERENCES

- [1] **Heath, T., Oc, T., & Tiesdell, S. (2013).** *Revitalising Historic Urban Quarters* (1st ed.). Hoboken: Taylor and Francis
- [2] **Graham, Helen; Mason Rhiannon; Newman, Andrew.(2009).** *Historic Environment, Sense of Place, and Social Capital*; International center for cultural and heritage studies Newcastle university
- [3] **Keshavarz, M., & others. (2010).** Geological evolution of the concept of reinventing the city as a new approach in urban contexts. *Journal of Iranian Islamic City*, no 1, 73-92.
- [4] **Orbasli, A. (2000).** *Tourists in historic towns* (1st ed.). New York: E & FN Spon
- [5] **Hakimi, H. Nazari, S.& Nazari, N. (2015).** Revitalization Strategies for Historical Squares, Case Study: Sahebabad Square. *Journal of geography and planning*,52(4),65-83
- [6] **Mason, R., Uluca Tumer, E., Kiliç-Ünlü, A., Silman, R., Severson, K., & Schmid, W.** The walled city of Famagusta. *A Compendium of Preservation Studies*, 2008–2012
- [7] **Doratli, N. (2005).** Revitalizing historic urban quarters: A model for determining the most relevant strategic approach. *European Planning Studies*, 13(5), 749-772.
- [8] **Habibi, S., Maghsoodi, M. (2007).** *Urban Restoration* 6nd Ed. Tehran: Tehran University
- [9] **Ryberg-Webster, S. & Kinahan, K. (2013).** Historic Preservation and Urban Revitalization in the Twenty-first Century. *Journal Of Planning Literature*, 29(2), 119-139.
- [10] **Nasser, N. (2003).** Planning for Urban Heritage Places: Reconciling Conservation, Tourism, and Sustainable Development. *Journal Of Planning Literature*, 17(4), 467-479.
- [11] **Herrera, L., Smith, N., & Vera, M. (2007).** Gentrification, Displacement, and Tourism in Santa Cruz De Tenerife. *Urban Geography*, 28(3), 276-298.
- [12] **Ashworth, G. & Page, S. (2011).** Urban tourism research: Recent progress and current paradoxes. *Tourism Management*, 32(1), 1-15.
- [13] **Den, B. L. van, & Russo, A. P. (2017).** *The Student City: Strategic Planning for student communities in EU cities*. Routledge.
- [14] **Pickard, R. (2001).** *Management of historic centres*. London: Spon Press.
- [15] *International cultural tourism charter. Managing Tourism at Places of Heritage Significance* (1999) .(2016). Retrieved 3 November 2016, from http://www.icomos.org/charters/tourism_e.pdf
- [16] *ICOMOS, The Valletta Principles for the Safeguarding and Management of Historic Cities, Towns and Urban Areas.* (2016).ICOMOS. Retrieved 21 December 2016, from http://www.icomos.org/Paris2011/GA2011_CIVVIH_text_EN_FR_final_20120110.pdf
- [17] **Tulban, N.(2011).** Architecture and tourism. *Journal of EcoAgriTourism* 2011 Vol. 7 No. 2 pp. 67-71.

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Evaluation Criteria of Parasitic Architecture*



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Abstract: It has been observed in the literature that examples of installations, sculptures or building elements and their annexes are stated as parasitic architectural products. These misinformation also indicate that parasite architecture features are issues that need to be studied and discussed. Research problem is "can the determined features, land use, relocation, originality, flexibility, compatibility with human scale, ease of assembly, sustainability, be used in the questioning of parasitism of a building?" In the study, symbiosis, parasite and parasitic architecture were questioned in the literature. As a result of the concept and case analysis, the properties that will enable the structures to be characterized as parasites have been determined. Within the scope of the research, the parasitism of one hundred structures, which were obtained through literature research and considered as examples of parasitic architecture, were evaluated. Generalizations have been made by trying whether these determined features can be used in the questioning. There are a few main features that distinguish parasitic architecture from other architectural approaches. These features, which were determined as a result of the researches made on the literature and internet resources; are independence from space, relocation, flexibility, size, assembly, sustainability and originality. The most important thing to note here is that all these features follow each other. Each feature allows another feature to exist. In order to talk about the parasitism of a structure, the parasite must provide all these features. The aim of this study is to add descriptive new criterias as well as bringing together the existing ones, in a certain framework in order to define the concept of parasitic architecture by examining a limited number of sources related to parasitism. For this purpose, a significant number of samples found were examined according to the determined parameters by listing their tags and parasitism characteristics separately. As a result, it is determined that there are many installation and infill examples defined as parasites in the literature, although they are not parasites. It is considered that these false acceptances will decrease as number of studies explaining the concept and its examples increase.

Keywords: Symbiosis, symbiotic relationship, parasite, parasitic architecture, evaluation criteria.

Parazit Mimarinin Değerlendirme Kriterleri

Özet: Literatürde enstalasyon örneklerinin, heykellerin ya da yapı elemanlarının ve eklerinin parazit mimari ürünleri olarak belirtildiği gözlemlenmektedir. Bu yanlış bilgilendirmeler parazit mimari ve özelliklerinin çalışılması ve tartışılması gereken konular olduğunun göstergeleridir. Araştırma problemi; belirlenen arazi kullanımı, yer değişimi, özgünlük, esneklik, insan ölçeğine uygunluk, montaj kolaylığı, sürdürülebilir olması özelliklerinin parazitlik sorgulamasında kullanılıp kullanılamayacağıdır. Çalışmada literatürde simbiyoz, parazit ve parazit mimari sorgulanmıştır. Kavram ve örnek analizleri sonucunda yapıların parazit olarak nitelendirilmelerini sağlayacak özellikleri belirlenmiştir. Araştırma kapsamında literatür araştırması ile elde edilen ve parazit mimari örneği sayılan yüz adet yapının parazitlikleri değerlendirilmiş, bu belirlenen özelliklerin sorgulamada kullanılıp kullanılamayacağı deneyerek çıkarımlara varılmıştır. Parazit mimariyi diğer mimari yaklaşımlardan ayıran birkaç temel özellik vardır. Literatür ve internet kaynakları üzerinde yapılan araştırmalar sonucunda belirlenen bu özellikler; mekandan bağımsızlık, yer değiştirme, esneklik, boyut, montaj, sürdürülebilirlik ve orijinalliktir. Burada dikkat edilmesi gereken en önemli husus tüm bu özelliklerin birbirini takip etmesidir. Her özellik başka bir özelliğin var olmasına izin verir ve sebep olur. Bir yapının parazitliğinden söz edilebilmesi için parazitinin tüm bu özellikleri sağlaması gerekir. Bu çalışmada amaç, parazit mimari ile ilgili sınırlı sayıda kaynağı inceleyerek bir yapıyı parazit olarak tanımlayabilmek üzere, hali hazırda var olan kriterleri bir araya getirmek ve tanımlayıcı yenilerini ekleyerek belirsizlikleri bulunan parazitlik kavramını belirli bir çerçevede tanımlamaktır. Bu amaçla bulunabilen önemli sayıda örnek, künyeleri ve parazitlik özellikleri ayrı ayrı listelenerek belirlenen parametrelere göre incelenmiştir. Sonuçta parazit olmadığı halde literatürde parazit olarak tanımlanan birçok enstalasyon ve infill örneği bulunduğu tespit edilmektedir. Kavramı ve örneklerini açıklayıcı çalışmalar arttıkça bu yanlışların azalacağı değerlendirilmektedir.

Anahtar Kelimeler: Simbiyoz, simbiyotik ilişki, parazit, parazit mimari, değerlendirme kriterleri.

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1. INTRODUCTION

The interest in parasitic architecture has increased with the realization of the possibilities it provides such as offering practical and economical solutions to housing and shortage of space, criticizing existing and misapplied regulations, making unused structures usable, functionalizing and adding value to the blank façades of existing buildings, providing fast and practical construction process. Its examples in the world are increasing day by day.

However, it has been observed in the literature that examples of installations, sculptures or building elements and their annexes are stated as parasitic architectural products. These misinformation also indicate that parasite architecture features are issues that need to be studied and discussed. In the study, symbiotic relationship, symbiosis, parasite and parasitic architecture were questioned in the literature.

In the framework of the study, parasitic structures and the factors determining the parasitism were investigated. Some criteria are required for structures to be defined as parasites. In order to determine these criteria, first of all, a general literature review was made. By investigating the studies, [1]“Mesoparasite: A Symbiotic Affair”, [2]“Parasitic Ecologies: Extending Space Through Diffusion Limited Aggregation Models”, [3]“Strategic Intervention: Parasitic Architecture”, [4]“Re-inhabiting the Void”, [5]“Parasites on Architecture: An Assessment of Building Additions in Mahmutpaşa, İstanbul”, [6] “Urban Parasites: Re-appropriation of Interstitial Spaces in Architecture Through the Act of Graffiti”, [7]“Parasitic Architecture”, [8] “Emancipating Urban Interventions: Parasitic Spaces”, [9]“Traces of The Past Utopias in Contemporary Architecture: Parasitic Architecture”, [10]“Parasitic architecture”, [11] “Alternative Approaches in Architectural Design Education: ‘Parasitic Architecture’ as a Space Design Strategy”, [12]“*İç Mimari Tasarım Eğitiminde İnfornel Yaklaşımına Bir Örnek: Parazit Eklemler Çalıştayı*” and all parameters they used to define the parasitic architecture, the evaluation tables been created to examine the structures systematically. Than a total of a hundred structures were reached by searches made on search engines with the keywords "parasitic space", "urban parasite", "parasite architecture", "architectural parasite", "parasitic building", "host building", "parasitic structure", "parasitic space".

As a result of the concept and case analysis, the properties that will enable the structures to be characterized as parasites have been determined. Research problem is "can the determined features, land use, relocation, originality, flexibility, compatibility with human scale, ease of assembly, sustainability, be used in the questioning of parasitism of a building?" Within the scope of the research, the parasitism of one hundred structures, which were obtained through literature research and considered as examples of parasitic architecture, were evaluated. Generalizations have been made by trying whether these determined features can be used in the questioning.

2. SYMBIOSIS AND PARASITE

Symbiosis literally means 'common life'. It refers to any kind of relationship between two or more different species. Symbiotic associations are common in nature, from bacteria or fungi that form close alliances with terrestrial plants to those between giant pipeworms and sulfur-oxidizing bacteria that live together in the depths of the ocean (Figure 1). Even humans carry a reminder of an ancient symbiosis (mitochondria and organelles in their cells that were once symbiotic bacteria [13,14]. Organisms in this togetherness are called symbionts, and large organisms that contain organisms smaller than these symbionts and are its food source are called hosts.



Figure 1. Symbiotic relationships between creatures [15].

Symbiosis is divided into three sub-titles as mutualism, commensalism or parasitism according to the benefit of the symbionts.

3. PARASITIC ARCHITECTURE

Parasites, one of the important subjects of biology, are defined as an organism that clings to another creature in order to survive and provides its vital needs from this creature called the host. There is an ecological relationship between the parasite and its host, and this relationship is symbiotic, that is, it requires coexistence.

Parasitic architecture is defined as the architecture of adaptive, temporary and exploitative forms that establish strong relationships with the host building and/or buildings and expresses a design approach based on alternative space production in the urban space [16,17]. It can be defined also as symbiotic architecture. Symbiotic architecture is the execution of human needs, the defense of man from outside effects and response to related changes [18, 19]. The lead of the parasitic architecture concept is German architect O. M. Ungers. Ungers defines parasitic architecture as the informal and unplanned use of large structures for personal purposes. A parasite must work with existing infrastructures and use them for its own survival [7].

Parasitic architecture can also be thought as an architectural intervention that embodies and transforms a constructed form. The parasitic building redefines and restructures the host building. The state of being a parasite to the host building is defined as being added to the existing structure of that building and using its energy. The parasitic building has the ability to transfer energy from one system to another [20].

4. DEVELOPMENT PROCESS

Especially can be argued that the parasitic architecture emerged after World War II as a result of rapid and unhealthy urbanization emerged with the Industrial Revolution that modern architecture criticized these problems and seek solutions to them and also the development of the ideas of the period brought new currents. Because the need for a rapid recovery after these conditions caused an increase in the number of architectural utopia proposals produced in this period. Exploring new possibilities for housing in an unhealthy and disorganized city, while at the same time criticizing the city, by removing the devastating consequences of both wars, has become the main goal of the replanning.

As a result of the literature research, it was seen that the first parasite structure examples emerged in the 1960s. Examples which can be named early parasites include, Pascal Häusermann's Settlement Units (1962), Haus-Rucker-Co's Baloon For 2 Vienna (1967) and Oase No.7 (1972), Jean-Louis Chanèac's 's Parasitic Cells (1968), Marcel Lachat's La Bulle Pirate (1970), and Atelier van Lieshout's Clip-On (1997) (Figure 2). The common point of these examples is to criticize the urban environment that existed at that time.

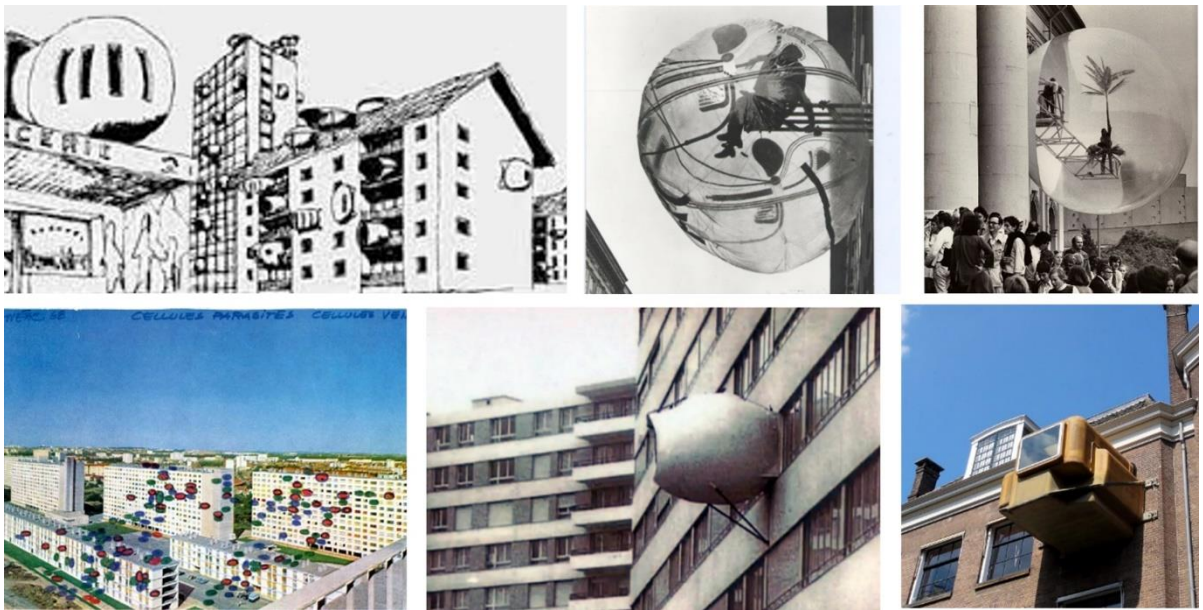


Figure 2. Respectively; Pascal Häusermann's Settlement Units (1962), Haus-Rucker-Co's Baloon For 2 Vienna (1967) and Oase No.7 (1972), Jean-Louis Chanèac's Parasitic Cells (1968) , Marcel Lachat's La Bulle Pirate (1970) and Atelier van Lieshout's Clip-On (1997).

When it comes to the 21st century, it is seen that the parasite samples have more contemporary forms with the unlimited design possibilities developed thanks to scientific developments and technologies, and they touch on more current issues. Inefficient use of lands, which is one of the biggest problems of today, is one of these current issues. In addition, the number of examples criticizing existing zoning regulations and trying to draw attention to problems such as homelessness and poverty is increasing day by day.

5. FEATURES of PARASITIC ARCHITECTURE

There are a few main features that distinguish parasitic architecture from other architectural approaches. These features, which were determined as a result of the research made on the literature and internet resources; are independence from space, relocation, flexibility, size, assembly, sustainability and originality. The most important thing to note here is that all these features follow each other. Each feature allows another feature to exist. In order to talk about the parasitism of a structure, the parasite must provide all these features.

The two most important features of parasitic architecture examples are independence from space and relocation. The first condition for a structure to be a parasite is that it must meet these two properties at the same time. Authenticity is a feature that develops with the desire of the parasitic structure to highlight its own existence and to be the focal point. The parasitic structure provides this with its form, material, size, message or the importance of the structure to which it is articulated. Sustainability, flexibility, small size and ease of assembly are the benefits of relocation (Table I).

Table I. Example of Evaluation Chart (Improved authors)

1st PART: IDENTIFICATION TAG			
Structure Graphic	Name of the Structure		
	Designer		
	Location		
	Date		
	Host	Defined	Undefined
	Application	Proposal	Applied
	Status		
	Lifecycle	Temporary	Permanent
Reference (URL)			
Purpose of Construction			
2nd PART: PARASITIC PROPERTIES			
1. Is there a land use?	Yes	No	
2. Can it relocate?	Yes	No	
3. Is it an original design?	Yes	No	
4. Does it have a flexible design?	Yes	No	
5. Is it human-sized?	Yes	No	
6. Is assembly quick and easy?	Yes	No	
7. Is it a sustainable building?	Yes	No	

Land Use

Architectural parasites are defined as structures that penetrate or even attack existing structures. Given their relationship with the host structure, they are adaptable, short-lived, and exploitative [1]. Parasitic structures can be articulated to one or more facades, roofs, installations, inside or below of the building or urban equipment they choose as a host, or they can be articulated between more than one host. Through these features, they do not occupy an area on the ground. At this point, it can be said that the first point where a parasitic structure is "parasited" is the grounds of existing structures. Parasites obtain these space needs indirectly from existing structures (Figure 3).

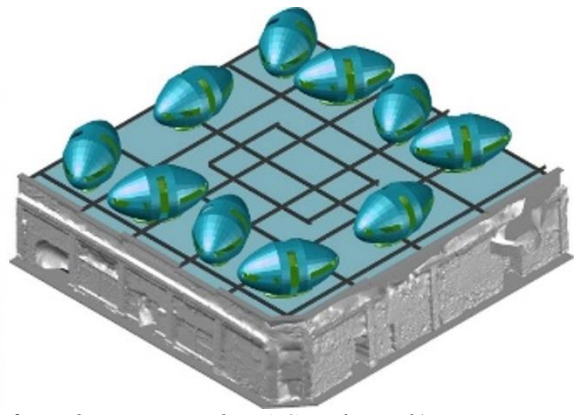
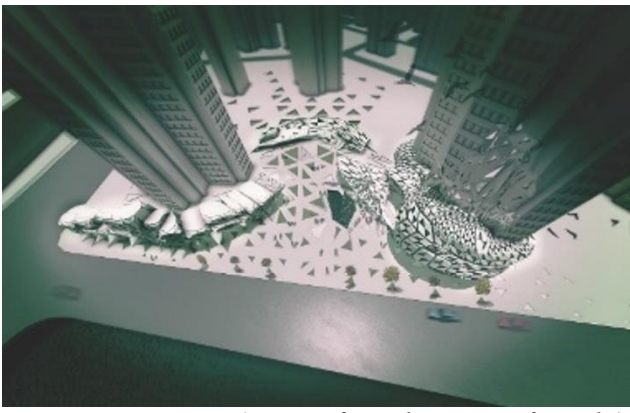


Figure 3. Use of Land -Unuse of Land (Left: Urbarasite Right: A Sneak Peak)

The first feature to be provided within the scope of the study was determined as 'land use'. Buildings that answer “Yes” to the question “Is there any land use?” cannot be considered as parasites. Therefore, samples 7, 9, 11, 12, 21, 48, 71, 72, 80, 82, 84, 87, 90, 98 cannot be considered as parasites due to their land use (Table 2).

Relocation

The fact that parasitic architecture examples can be articulated to the facades, roofs, installations of existing structures and between more than one structure allows them to be displaced in some possible cases. This displacement means that they can be re-joined into other structures with physical properties parallel to the structures to which they were previously articulated [21]. The fact that the parasites are in singular forms and small volumes, produced as prefabricated and can be attached and dismantled makes it easier to move (Figure 4).



Figure 4. Displaceable - Unreplaceable Structures (Left: Oase No.7 Right: The Niemeyer Sphere)

'Relocation' is the second feature considered for the buildings that provide land use. As in land use, buildings that do not have this feature are not examples of parasitic architecture. Samples 31, 34, 35, 37, 39, 46, 47, 52, 58, 70, 75, 85, 96, 97 cannot be qualified as parasites because they cannot be displaced.

There are also a few artifacts in the table that are not considered examples of parasitic architecture, although they provide both space utilization and displacement characteristics. 15, 26, 36, 45, 61, 62, 69 and 73 are among these examples (Table 2). Among these examples, the works numbered 15, 36, 45, and 61 are not an architectural work, but a work of sculpture. The work no. 62 is a contemporary addition made within the scope of the restoration of a historical building. The work numbered 73 is not a building, but an architectural element (canopy) and can be considered as a contemporary addition. Artifact 69 is an urban object.

Originality

In the examples of parasitic architecture, on the one hand, the structural and programmatic integrity of the existing structure is preserved, on the other hand, it is observed that they cause a transformation in the articulated structure. This transformation can be explained by a new structural situation consisting of the combination of parasite and host structures, in which the boundaries of the existing structure are redrawn [4]. This new structural situation can draw attention by making visible new spatial possibilities that the citizens were not aware of before, small touches can create big spatial-experiential effects [4]. At the root of these effects is the parasite's desire to be a landmark in the city. Even though it moves with the structure it is articulated to, it tries to bring itself to the fore in order to destroy the existing urban identity. This visibility is usually provided by the form of the parasite. The size of the parasite, its material, the message it wants to convey and the importance of the host to which it is articulated can also increase or decrease this visibility. In addition, all parasitic structures are articulated to existing structures, giving a message that criticizes the "use of land" and tries to draw attention to this issue. In this context, it would not be wrong to say that all parasite structure samples are original.

Flexibility

The concept of flexibility means that when the parasitic structure is displaced, it can adapt to the structure it chooses as a new host. This harmony is provided both physically and functionally. In a physical context, flexibility means being able to attach to a new structure, and all parasites have this ability. Functional flexibility is a feature of open-planned parasite that is not designed only for a single purpose. These parasites have a function according to the user's intended use of the structure (Figure 5).

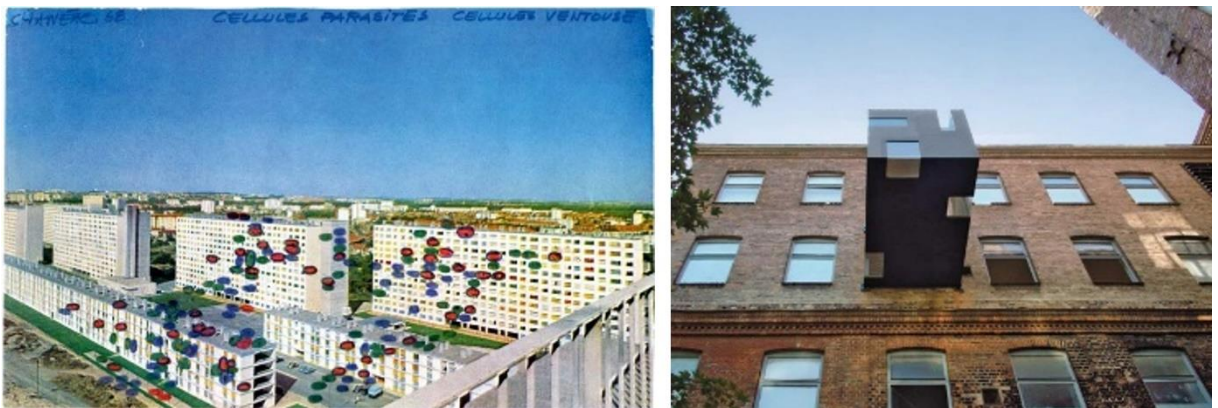


Figure 5. Flexible Structures (Left: Parasitic Cells Right: Rucksack House)

When the structures are evaluated in terms of flexibility, it is seen that all of them provide this premise. It can be said that all parasitic structures are flexible because of the displacement feature.

Small Size

Parasitic architectural products are designed in minimum volumes according to human dimensions and needs in order to be statically rigid because they do not need land and adapt to existing buildings and use their structures. The most important reason for this is not to damage the load-bearing properties of the buildings to which they are articulated. Because the existence of the parasite depends on the presence of the host structure. At the same time, the limited space in which the samples designed between two or more buildings will be located can be counted among the reasons for this. Another reason is the ability of displacement of parasite. The smaller the size of a structure, the easier it is to relocate. In addition, this supports the sustainability of the parasite. As the size decreases, the energy requirement and carbon footprint of the parasitic structure also decrease (Figure 6).



Figure 6. Dimensions in parasitic architecture [Left; *Excrescent Utopia* Right: *Hong Kong Club Hotel*]

When they are evaluated in terms of size; All structures are smaller in size (modular structures by module) as the smaller the parasite, the easier the handling will be.

Ease and Speed of Assembly

When evaluated in terms of assembly, which is one of the other benefits of the displacement ability, it is seen that all the remaining 64 structures provide this feature. In order for the parasite to separate from the existing host and articulate to the new host, its assembly must be easy and fast. All parasites therefore provide the premise of 'assembly'.

Sustainability

Sustainability, on the other hand, must be addressed in several different ways. It is functionally provided when evaluated as a benefit of displacement. The parasite continues its life by changing its function according to the needs of the new host. Buildings 1, 3, 10, 23, 24, 28, 30, 33, 63, 78 and 95 are functionally sustainable buildings. The concept is directly proportional to the dimensions. As the size decreases, the energy requirement and carbon footprint of the parasitic structure also decrease. All buildings (modular structures on module basis) except building 76 are small in size, so they are in this sustainability class.

The fact that they are made from recycled, recyclable, or environmentally friendly materials or use sustainable technologies are also different indicators of the sustainability of the parasite. Buildings 17, 20, 28, 29, 30, 42, 55, 65, 76, 92 and 95 due to sustainable technologies; buildings 8, 18, 20, 22, 24, 29, 57, 68, 99 and 100 made of recycled materials; structures 2, 5, 16, 17, 19, 25, 27, 40, 67, 74 and 86 made of recyclable materials and buildings 14, 32, 33, 44, 49, 50, 51, 53, 56, 59, 60, 64, 66, 89, 91, 93 and 94 made of wood, one of the environmentally friendly materials, can be considered as sustainable buildings (Table II).

In the 1960s, parasitic architecture emerged as a reaction to the existing city skyline and land use. Therefore, the parasite of a structure also means that it is independent of a land on the ground. Compared with the data obtained from the table, it is seen that the question "Is there a land use?" is a qualified question that can be used in determining the parasitism of a building. However, it is known from the researchers that this problem is not sufficient on its own and that a parasitic structure should have the ability to displace as well as being independent from the land. For this reason, the question 'Can it relocate?' asked to the structure described as a parasite should be evaluated together with the

question 'Is there any land use?'. The use of the concepts of flexibility, size, ease of assembly and sustainability, which are other benefits of relocation, and the questions related to these concepts, in the determination of parasitism in the absence of relocation can lead to misleading results. Although the concept of originality is one of the most basic features that comes with the approach of parasitism to the city skyline, it seems to be ineffective when used in determining parasitism. As a matter of fact, it is seen from the table that some buildings that use land and cannot be moved are original. In this regard, when the concept of 'authenticity' is examined in more detail (for example, as the message given by the parasite, not as form or material), it is predicted that righter results can be obtained.

6. DISCUSSION

These examples, which stand out as a dominant form in the urban texture, survive by being articulated with the existing structures with an approach that criticizes the existing urban silhouette and order. It is foreseen that it will take a long time for these examples, which show a different way of existence from the conventional architectural approaches, to be accepted by the residents of the city, local governments, and many countries. For these reasons, it is thought that many of the parasitic architecture examples remain only as suggestions. Some of the applied examples were implemented illegally because they did not comply with local regulations. This illegal situation can raise the stagnant silhouette of the city, which is criticized by parasitic architecture, to a chaotic level. In order to prevent this process from occurring, it is important to determine the characteristics, purpose and boundaries of the parasitic architecture. In order to prevent this, parasitic architecture should be fully accepted by the architectural culture, and some limitations should be imposed on these practices within the framework of international, national and local regulations. By understanding the parasitic architecture over time, this chaotic situation can be prevented, and the message intended to be given by the parasite architecture can be better understood.

The need for living, working, resting and entertainment areas will increase rapidly due to the increase in the population in the future and the prediction that this population will predominantly prefer urban life. Economic trends, sustainability culture and protectionist approaches emphasize that it is the most appropriate practice to update the existing one and to continue its use with small interventions, instead of building new ones. It is an undeniable fact that parasitic production will be one of the solutions to the architectural problems of the future when we look at the area and building potentials in cities. When the examples of parasitic architecture are examined, they provide change and adaptation in the existing urban area, lifestyle and structure. In doing so, they can be demountable, and they can grow and shrink. In summary, PARASITE architecture promises EASY ADAPTATION to new living conditions.





















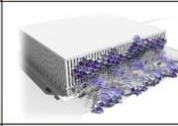




7. RESULTS










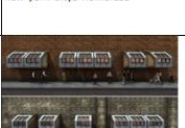








64 structures that met all the criteria are accepted as parasites out of 100 buildings evaluated as examples of parasitic architecture in the literature. Based on the data in the table, it can be said that the relationship between the parasite and the host structure was established entirely for the benefit of the parasite. The important thing in this relationship is the survival of the parasite and the host structure has no decision in this relationship. It is the parasitic structure that determines which host it will establish a structural relationship with. In terms of spatial relationship, supporting the host structure as a usage area or as a function is again only determined by the parasite structure. While it may not establish a spatial relationship with the host, the parasite may also undertake a complementary function to the host structure. This is entirely at the discretion of the parasite (designer) and is temporary. In possible cases, the parasite can leave the host and find another host.










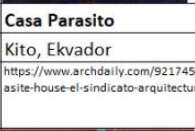















When evaluated in terms of form and material, the parasite is generally incompatible with the host. The reason for this is that the structure that should be emphasized and visible and symbolic in this relationship is the parasitic structure. The parasite is usually smaller in size than the host. The reason for this is that relocation can be carried out easily and quickly. Another reason is not to damage the statics of the host structure. Access to the parasitic structure varies according to the relationship


























between the parasite and the host and the state of articulation. In summary, the relationship between the host and the parasite is completely under the control of the parasite. It is the parasite that takes almost all the benefits out of this relationship.

Table II. Parasite Architecture Evaluation Chart (Improved by authors)

1		8		15		22	
Settlement Units	Grilly, France	Parasite	Stockholm, Sweden	Tree Huts	Paris, New York, Florida...	Ame-lot	Paris, France
	Sevinç, A. 2005. İkinci Dünya Savaşı Sonrası Mimarlık Hayalleri: Ütopya Eskizleri. DR Tezi. İ.T.Ü./Fen Bil. Ens. İstanbul		https://teamkipaa.eu/Parasite/Parasite/		https://www.designboom.com/art/tree-huts-at-place-vendome-by-tadashi-kawamata-10-22-2013/		https://www.archdaily.com/147738/ame-lot-malka-architecture
2		9		16		23	
Balloon for 2 Vienna	Vienna, Austria	Children's Room	Meksico, USA	Prefab Parasite	Sidney, Australia	City Wall Parasites	Milano, Italy
	https://www.zamp-kelp.com/balloon-for-2/		https://www.designboom.com/interviews/fernando-romero-interview/		https://www.archdaily.com/35859/parasite-prefab-lara-calder-architects		https://www.archilovers.com/projects/60301/90-degrees-architecture.html
3		10		17		24	
Parasitic Cells	Geneva, Switzerland	Rucksack House	Köln-Leipzig, Germany	Bio-Box	Paris, France	Manifest Destiny	San Francisco, USA
	http://hiddenarchitecture.net/cellules-parasites/		https://inhabitat.com/stefan-eberstadts-rucksack-house-provides-instant-space-light-for-a-cramped-apartment/		https://www.stephanmalka.com/portfolio/bio-box-i-des-jardins-pour-tous-i-2009/		https://www.dezeen.com/2012/02/16/manifest-destiny-by-mark-reigelman/
4		11		18		25	
La Bulle Pirate	Geneva, Switzerland	Manresa City Hall	Manresa, Spain	PAR / Self Defence	Paris, France	Stairway Cinema	Auckland, New Zealand
	http://hiddenarchitecture.net/cellules-parasites/		https://www.archdaily.com/17022/manresa-city-hall-add-bailo-rull		https://www.daillytonic.com/auto-defense-by-stephane-malka-fr/		https://www.archdaily.com/246874/stairway-cinema-installation-oh-no-sumo
5		12		19			
Oase No.7	Kassel, Germany	RDF181	Brüksel, Belgium	Concierge 001	Belgium		
	http://architectuel.com/architecture/oase-no-7		https://www.atlasofplaces.com/architecture/rdf181/		https://www.tubelight.nl/karl-philips/		
6		13		20			
Clip-On	Utrecht, Holland	Para'site	St. Louis, USA	Parasitic Emergency Shelt.	Sao Paulo, Brasil		
	https://www.kunstnopenbarerimte-utrecht.nl/kunstwerken/clip		http://object-e.net/uncategorized/parasite		https://inhabitat.com/parasitic-emergency-homes-can-be-implanted-onto-abandoned-buildings/		
7		14		21			
Wozoco	Amsterdam, Holland	Taka Tuka Land	Berlin, Germany	Cirbuats	Gent, Belgium		
	https://www.archdaily.com/115776/ad-classics-wozoco-mrvd		https://www.archdaily.com/519/taka-tuka-land-baupiloten		https://www.dezeen.com/2013/08/09/cirbuats-sculpture-by-nick-ervinck/		
						PARASITIC BUILDING	
							NON-PARASITIC BUILDING

26		33		47	
Ipervasi	Loft Cube Berlin, Germany https://v3.arkitera.com/p161-loftcube.html	Nomiya Paris, France https://www.archdaily.com/37060/nomiya-temporary-restaurant-pascal-and-laurent-grasso	192 Shoreham Street Sheffield, England https://www.10.aecafe.com/blogs/arch-showcase/2012/03/17/shoreham-street-in-sheffield-uk-by-project-orange/		
https://www.10.aecafe.com/blogs/arch-showcase/2013/01/09/iperisasi-in-nicosia-cyprus-by-constantinos-kalisperas-architectural-studio/					
27		41		48	
A-Kamp 47	Didden Village Rotterdam, Holland https://www.archdaily.com/13370/didden-village	The 9 April Garden Lisbon, Portugal https://www.archdaily.com/165889/bar-no-jardim-9-de-abril-aspa	Støperiet Bergen, Norway https://www.archdaily.com/441310/the-iron-foundry-link-arkitektur		
Marseille, France					
https://www.archdaily.com/461696/a-kamp47-stephane-malka					
28		42		49	
Homed	Growing House London, England https://inhabitat.com/gorgeous-garden-apartment-grows-above-a-warehouse-rooftop-in-london/roof-garden-apartment-tonkin-llu-1/	The Cube Brussels, Milano, London... https://www.archdaily.com/196951/the-cube-park-associati	Detached (Cabin) Athens, Greece https://www.dezeen.com/2015/01/09/panos-dragonas-varvara-christopoulou-city-rooftop-cabin-conceptual-parasite-forest-hut-alternative/		
New York, ABD					
https://www.archdaily.com/886422/3d-printed-hexagonal-pods-could-house-new-york-citys-homeless					
29		43		50	
Sleeping Pods	House Attack Vienna, Austria Buenos Aires, Argentina https://www.designingbuildings.co.uk/wiki/House_Attack	Your Rainbow Panorama Aarhus, Denmark https://www.archdaily.com/469611/your-rainbow-panorama-olafur-elliasson	Port9 New Bridge Paris, France https://inhabitat.com/port9-proposes-a-parasitic-takeover-of-a-paris-bridge-to-create-a-voluntary-ghetto/port9-stephane-malka-8/		
London, England					
https://www.archdaily.com/770386/the-e-detachable-pods-aim-to-provide-shelter-for-britains-homeless					
30		44			
Between Parasites and the City	Tuby Poznan, Poland http://arqmundial.blogspot.com/2008/01/polonia-ampliac-in-del-museo-de-arte.html	A Room for London London, England https://www.dezeen.com/2012/01/13/a-room-for-london-by-david-kohn-and-fiona-banner-2/			
Barcelona, Spain					
https://futurearchitectureplatform.org/projects/#26da915-b9ba-47a5-8044-bf1a70b5cb95/					
31		45			
Rooftop Office	Hotel Everland Paris, France http://www.bubblemania.fr/en/mobile-chambre-hotel-everland-burgdorf-suisse-architectes-designers-daniel-baumans-sabina-lang-2002-2008-san-francisco/	Fallen Star San Diego, California https://www.designboom.com/art/do-ho-suh-fallen-star-now-open-to-the-public/	PARASITIC BUILDING		
Vienna, Austria					
https://archidose.blogspot.com/2000/10/rooftop-office.html					
32		46			
Parasite Las Palmas	Tayson House Bradford, England https://www.dailytonic.com/tayson-house-in-bradford-uk-by-kruschonberg-architects/	Neosmann Paris, France https://www.stephanemalka.com/portfolio/neosmann-i-occupy-the-roofs-i-paris-2012/	NON-PARASITIC BUILDING		
Rotterdam, Holland					
https://inhabitat.com/bright-green-las-palmas-parasite-hangs-on-the-shoulder-of-abandoned-rotterdam-warehouse/					

			
<p>51</p> <p>Haven</p> <p>Gard, France</p> <p>https://www.dezeen.com/2015/10/15/nas-architecture-installs-wooden-vortex-pavilion-over-medieval-city-wall-france/</p>	<p>58</p> <p>Hofstraat</p> <p>Gent, Belgium</p> <p>https://www.archdaily.com/919191/hofstraat-house-addition-dierendonckblanche-architects</p>	<p>65</p> <p>Slow Up-Rising</p> <p>Kalabriya, Italy</p> <p>https://inhabitat.com/parasitic-city-takes-over-decommissioned-italian-highway/slow-uprising-2/</p>	<p>72</p> <p>Sliver House</p> <p>London, England</p> <p>https://inhabitat.com/incredibly-skinny-sliver-house-slips-into-a-lot-as-narrow-as-ten-feet-across/001-tif/</p>
			
<p>52</p> <p>Piñeiro House</p> <p>Buenos Aires, Argentina</p> <p>https://www.archdaily.com/771606/pineiro-house-adamo-faiden</p>	<p>59</p> <p>Bridging Home</p> <p>London, England</p> <p>https://www.designboom.com/art/do-ho-suh-bridging-home/</p>	<p>66</p> <p>Hidden Studio</p> <p>Valencia, Spain</p> <p>https://www.dezeen.com/2017/08/18/secret-studio-under-bridge-fernando-abellanas-architecture-valencia-spain/</p>	<p>73</p> <p>Energy Roof</p> <p>Perugia, Italy</p> <p>https://www.dezeen.com/2010/01/21/energy-roof-perugia-by-coop-himmelblau/</p>
			
<p>53</p> <p>Workshop in the City</p> <p>Las Condes, Chile</p> <p>https://www.archdaily.com/786491/workshop-in-the-city-romero-silva-arquitectos</p>	<p>60</p> <p>Casa Parasito</p> <p>Kito, Ekvador</p> <p>https://www.archdaily.com/921745/parasite-house-el-sindicato-arquitectura</p>	<p>67</p> <p>Light House</p> <p>Bangkok, Thailand</p> <p>https://www.designboom.com/architecture/chicago-architecture-biennial-allzone-light-house-bangkok-10-12-2015/</p>	<p>74</p> <p>Parasite Office</p> <p>Moscow, Russia</p> <p>https://www.designboom.com/architecture/za-bor-architects-parasite-office-in-moscow/</p>
			
<p>54</p> <p>A Sneak Peak</p> <p>Perth, Australia</p> <p>https://intoxicationhousing.weebly.com/</p>	<p>61</p> <p>Redball Project</p> <p>Various Cities</p> <p>https://www.designboom.com/art/redball-project-antwerp-public-art-installation-08-30-2016/</p>	<p>68</p> <p>Tube Innsbruck</p> <p>Innsbruck, Austria</p> <p>https://www.dezeen.com/2015/09/01/nunen-for-use-tube-net-installation-giant-convulsing-centipede-innsbruck/</p>	<p>75</p> <p>House Extension for a Cellist</p> <p>Chaville, France</p> <p>https://www.dezeen.com/2015/05/26/cut-architectures-house-extension-chaville-france-concrete-framed/</p>
			
<p>55</p> <p>3BOX</p> <p>Paris, France</p> <p>https://www.designboom.com/architecture/stephane-malka-3box-modular-housing-paris-01-08-2016/</p>	<p>62</p> <p>S(ch)austall</p> <p>Pfalz, Germany</p> <p>https://arq.com/english-es/architectures/schaustall-pfalz-germany.html</p>	<p>69</p> <p>Brückenbunker</p> <p>Berlin, Germany</p> <p>https://www.archdaily.com/934564/bruckenbunker-installation-ramiro-carro-lucas-ibarra-arquitectos</p>	
			
<p>56</p> <p>Dachkiez</p> <p>Berlin, Germany</p> <p>https://www.ad-magazin.de/article/dachkiez-berlin</p>	<p>63</p> <p>Bunker Gallery</p> <p>Paris, France</p> <p>https://www.bldgblog.com/topics/uncategorized/page/93/</p>	<p>70</p> <p>Bridge of Aspiration</p> <p>London, England</p> <p>http://architectureul.com/architecture/bridge-of-aspiration</p>	<p>PARASITIC BUILDING</p>
			<p>NON-PARASITIC BUILDING</p>
<p>57</p> <p>Antepavilion</p> <p>London, England</p> <p>https://www.dezeen.com/2017/08/04/put-architects-roof-pavilion-antepavilion-air-duct-architecture-foundation-shivalondon-hackney/</p>	<p>64</p> <p>De Nieuwe Kerk Enst.</p> <p>Amsterdam, Netherlands</p> <p>https://www.architectuur.nl/nieuws/kerk-meester-van-de-nieuwe-kerk/</p>	<p>71</p> <p>Legal/Illegal</p> <p>Köln, Germany</p> <p>https://www.archdaily.com/133678/legal-illegal-manuel-herz-architects</p>	

76		83		90		97	
Hong Kong Club Hotel		Walk On (Balcony)		Bow-House		The Niemeyer Sphere	
Hong Kong, China		Gliwice, Polonya		Herleen, Netherlands		Leipzig, Germany	
https://www.archdaily.com/210547/evated-night-club-hotel-in-hong-kong-urbanplunger		https://inhabitat.com/spiraling-green-covered-walkway-unfurls-from-an-office-window/zalewski-architecture-group-twisted-green-balcony-walkway/		https://www.designboom.com/architecture/stephane-malka-architecture-bow-house-09-17-2014/		https://www.archdaily.com/949266/osc-ar-niemeyer-designs-white-concrete-and-glazed-sphere-an-extension-of-a-factory-canteen-in-germany	
77		84		91		98	
Chambre Suspendue		Opod Tube House		Lamp Parasite		Urbarasite	
Gentilly, France		Hong Kong, Japan		Moskova, Russia		Seoul, South Korea	
https://www.darchitectures.com/ejap-2014-lucie-niney-nem-architectes-a1904.html		https://www.metalocus.es/en/news/opod-tube-housing-james-law-cybertecture		https://www.archpaper.com/2020/01/future-architecture-creative-exchange-2020/		https://architizier.com/projects/urbarasite/	
78		85		92		99	
Heart		Michael Lee-Chin Crystal		Constructed Cloud		paraSITE - I	
Newyork, USA		Ontario, Canada		New York, ABD		Newyork, Boston, ...	
https://inhabitat.com/heart-of-the-district-is-an-innovative-hotel-lobby-that-hangs-like-a-parasite-between-existing-buildings/za-architects-heart-of-the-district4/		http://mimdap.org/2009/10/michael-lee-chin-kristali/		https://www.evolo.us/constructed-cloud-generative-growth-aggregation-in-solar-environment/		https://archinect.com/features/article/149944931/parasite-the-bandage-over-the-nomadic-wound	
79		86		93		100	
Keret House		Eiffel DNA		Plug-In City 75		paraSITE - II	
Warsaw, Poland		Paris, France		Paris, France		Newyork, Boston,	
https://www.archdaily.com/152505/keret-house-centrala		https://www.dezeen.com/2008/03/25/eiffel-dna-by-serero-architects/		https://www.designboom.com/architecture/stephane-malka-plug-in-city-75-paris-03-02-2017/		https://archinect.com/features/article/149944931/parasite-the-bandage-over-the-nomadic-wound	
80		87		94			
Great James Street		Eco-Pods		Parasitic CN Tower			
London, England		Boston, USA		Toronto, Canada			
https://www.archdaily.com/465873/great-james-street-emys-architects		https://www.dezeen.com/2009/10/02/eco-pods-by-howeler-yoon-architectureand-squaredesign-lab/		https://www.dezeen.com/2017/02/07/toronto-cn-tower-reimagined-residential-high-rise-parasitic-wooden-pods-quadrangle/			
81		88		95			
Live Between Buildings		Dead End Parasite		Flux Haus			
Berlin, Amsterdam, Oslo...		Tel Aviv, Israel		Hong Kong, China			
https://www.archdaily.com/412590/live-between-buildings-new-vision-of-loft-2-competing-entry-mateusz-mastalski-ole-robin-storjohann		https://alexpol.wordpress.com/2010/07/27/shenkar-interior-building-design-final-project-dead-end-parasite/		https://www.iaacblog.com/programs/flux-haus-2/			
82		89		96			
Jérôme Seydoux-Pathé V.		Excescent Utopia		Hutong Bubble 218			
Paris, France		London, England		Beijing, China			
https://www.dezeen.com/2014/06/04/rezo-piano-pathe-foundation-paris/		https://www.designboom.com/readers/excescent-utopia/		https://www.dezeen.com/2019/11/25/hutong-bubble-218-mad-beijing-hutong-architecture/			
							PARASITIC BUILDING
							NON-PARASITIC BUILDING

REFERENCES

- [1] Myburg, J. (2014). *Mesoparasite: A Symbiotic Affair*. (Master Thesis). Unitec Institute of Technology, Auckland.
- [2] Kachri, G. (2009). *Parasite Ecologies: Extending Space Through Diffusion - Limited Aggregation Models*. (Master Thesis). University College London / Bartlett School of Graduate Studies, Londra.
- [3] McDaniel, C. N. (2008). *Strategic Intervention: Parasitic Architecture*. (Master Thesis). University of Cincinnati, Cincinnati.
- [4] Adhienides, D. (2005). *Re-inhabiting the Void*. (Master Thesis). Pretoria University, Pretoria.
- [5] Yıldırım, B. (2016). *Parasites on Architecture: An Assessment of Building Additions in Mahmutpaşa, İstanbul*. Master Thesis. Yeditepe University/ Graduate School of Natural and Applied Sciences, İstanbul.
- [6] Yıldırım, S. (2013). *Urban Parasites: Re-appropriation of Interstitial Spaces in Architecture Through the Act of Graffiti*. (Master Thesis). Middle East Technical University/Graduate School of Natural and Applied Sciences, Ankara
- [7] Pit, M., Steller, K., Streng, G. (2017). T02 Essay Parasitic Architecture [PDF Document]. available at: <http://www.gerjanstreng.eu/files/T02%20essay%20parasitic%20architecture.pdf>. (accessed 3 Jan 2022).
- [8] Akgün Gültekin, A. ve Birer, E. (2019). *Emancipating Urban Interventions/ Kamusal Alanda Özgürleştirici Müdahaleler: Parazit Mekanlar*. *Kent Akademisi*. 12(40), 729-738.
- [9] Şensoy, G., & Üstün, B. (2018). Traces of the Past Utopias in Contemporary Architecture: Parasitic Architecture.
- [10] Baroš, T., & Katunský, D. (2020). *Parasitic architecture*. *Selected Scientific Papers-Journal of Civil Engineering*, 15(1), 19-28.
- [11] Yorgancıoğlu, D., Güray, T. (2018). Mimari Tasarım Eğitiminde Alternatif Yaklaşımlar: Bir Mekân Tasarımı Stratejisi Olarak 'Parazit Mimari'. *Megaron Journal*, 13, 144-155.
- [12] Özen, E. S. (2022). *İç Mimari Tasarım Eğitiminde İnfornel Yaklaşımına Bir Örnek: Parazit Eklemler Çalıştayı*. *Birimden Bütüne İnterdisipliner Tasarım Yaklaşımları*, 52.
- [13] Šijaković, M., Perić, A. (2018). Symbiotic Architecture: Redefinition of Recycling Design Principles. *Frontiers of Architectural Research*, 7, 67-79
- [14] Gürcan, B. (2015). *Mutualistic Understanding Of Fill-In Architecture*. Architectural Engineering Graduation Studio. AR3AE013 Research Paper. Delft Technical University, Delft.
- [15] Bilimkurgukulubu. (2020). available at: <https://www.bilimkurgukulubu.com/genel/bilim-teknoloji/ortak-yasam-simbiyoz-nedir-ve-nasil-evrimlesmistir/> (accessed 3 Jan 2022).
- [16] Albani, F. L. (2017). *New lives for deconsecrated churches. Symbolic values and the identity of places. In Conservation/Adaptation. Keeping alive the spirit of the place*. Adaptive re-use of heritage with symbolic values (pp. 11-16). EAAE, European Association for Architectural Education,
- [17] El-Shorbagy, A. (2020). *Parasites: Shaping the Image of the City*. Münih: BookRix
- [18] Ajeel and Hamza. (2019). "Symbiotic Architecture: Symbiotic as a Strategy in the Production of Contemporary Architectural Text". *International Research Journal of Engineering and Technology (IRJET)*.
- [19] Zamperini, E., & Lucenti, S. (2015). *Symbiotic Architecture for building and urban rehabilitation*. *Proceedings of REHAB*, 1037-1046.
- [20] Christenson, M. (2014). Comprehensive Parasites. Rethinking Comprehensive Design: Speculative Counterculture. *Proceedings of the 19th International Conference on Computer-Aided Architectural Design Research in Asia CAADRIA*, 14, 781-790.
- [21] Brown, G. (2003). Freedom and Transience of Space (Techno-nomads and Transformers). Robert Kronenburg (Ed.), *Transportable Environments 2* (s. 3-13). Londra: Spon.

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Daylighting Analysis In Selected Shopping Center Examples and A Horizontal Opening Proposal



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Abstract: Designs that can make maximum use of daylight in shopping areas, provide visual comfort conditions for users, increase the work performance and provide economic benefits in addition to healthy and relaxing spaces. In this context, as a method, illuminance level measurements were made at the determined points in the circulation areas of selected shopping centres; Galleria, Flyinn, Profilo and Cevahir AVM, and in line with the results obtained, the shopping center with the lowest illuminance level is chosen and a system design is proposed. In order to examine the relationship between the illuminance levels under different lighting conditions, the natural lighting simulation model of the shopping mall was composed and measurements were carried out for the characteristic dates of the year which are 21 March, 21 June, 21 September and 21 December. The aim of the study is to provide maximum natural lighting efficiency in the space; to provide economic benefits, to increase the workforce in the shopping mall, and thus to increase the satisfaction rate of the users, to ensure the sustainability of the use of the shopping mall. As a result of the study, evaluations were made by comparing the current measurements and a proposal of natural lighting system performance.

Keywords: Visual comfort, shopping spaces, skylight

Seçili Alışveriş Merkezi Örneklerinde Günışığı Analizi ve Yatay Açıklık Önerisi

Özet: Alışveriş mekânlarında günışığından maksimum oranda fayda sağlayabilecek tasarımlar ile, kullanıcıların görsel konfor koşullarını sağlayan sağlıklı ve rahatlatıcı mekânların iş görmeye bağlı performansı arttırdığı ve ekonomik bakımdan fayda sağladığı bilinmektedir. Bu bağlamda çalışmada yöntem olarak, seçili alışveriş merkezleri olan Galleria, Flyinn, Profilo ve Cevahir AVM’de ortak kullanım alanları olan giriş kat sirkülasyon alanlarında belirlenen noktalarda aydınlık düzeyi ölçümleri yapılmış ve elde edilen sonuçlar doğrultusunda aydınlık düzeyi en düşük olan AVM için bir doğal aydınlatma sistem tasarımı önerilmiştir. Farklı aydınlatma koşulları altında aydınlık düzeyleri arasındaki ilişkiyi incelemek için, doğal aydınlatma performansı en düşük olan AVM’nin doğal aydınlatma simülasyon modeli oluşturularak, yılın karakteristik tarihleri olan 21 Mart, 21 Haziran, 21 Eylül ve 21 Aralık’ta sabah-öğlen-akşam saatlerinde aydınlık düzeyleri ölçülmüştür. AVM içi sirkülasyon alanlarında kullanıcıların maksimum oranda doğal aydınlatmadan faydalanabilmeleri için çatı ışıklığı sistem tasarımı önerisinde bulunulmuştur. Çalışmanın amacı, yeni önerilen doğal aydınlatma sistem tasarımından sağlanan maksimum oranda hacim içi doğal aydınlatma verimi ile; ekonomik açıdan fayda sağlanması, AVM içi iş gücünün artırılması ve dolayısıyla kullanıcıların memnuniyet oranının da artması ile AVM kullanımının sürdürülebilirliğinin sağlanmasıdır. Çalışmanın sonucunda, mevcut ölçümler ile doğal aydınlatma sistem önerisi karşılaştırılarak değerlendirilmeler yapılmıştır.

Anahtar Kelimeler: Görsel konfor, alışveriş mekânları, çatı ışıklığı

1. INTRODUCTION

The lighting methods applied in shopping centre common areas and store interiors are the most important architectural components that provide the visual perception of users. Due to the inward-oriented architecture of many shopping centres designed today, it is seen that daylight cannot be used sufficiently in the interior spaces and the use of artificial lighting has gained vital importance due to the fact that these spaces serve until late at night. Since the sun is the most important inexhaustible renewable energy source, various methods have been developed to make the most efficient use of solar energy in buildings. An example of these methods is the effective use of daylight consisting of sunlight and skylight in shopping mall buildings with the skylight system, which is one of the contemporary lighting strategies.

The correctly applied design of natural lighting systems applied in shopping spaces, which are common use areas, is the one that provides international lighting values and ensures the visual comfort of business users and most importantly, reduces the use of artificial lighting. According to the researches, it has been revealed that natural lighting applications have visual and perceptual effects on users as well as their positive or negative effects on the business depending on efficient energy use and energy use amounts. Depending on these factors, users work performance and satisfaction are also affected [1]. Since the natural lighting selected as the subject of the research depends on many different external variables, the effects of natural lighting were tried to be determined.

2. NATURAL LIGHTING IN SHOPPING CENTERS

Comfortable interiors created by improving the quality of the natural lighting system and lighting increase the productivity and performance of the user [2]. Shopping malls do not have the potential to use high natural lighting because they are multi-storey buildings due to their structure and there are no openings on the exterior facades in order to increase the display areas of the stores. In this context, the majority of stores do not utilize natural lighting and do not use a natural lighting design combined with artificial lighting [3]. With the emergence of the psychological and physiological effects of natural lighting on people with the studies conducted in the past, the potential users of shopping spaces increase sales with a pleasant in-space experience, strengthen the in-space atmosphere and achieve a good color rendering in the space by bringing daylight into the space from the atrium area [3].

2.1 Natural Lighting Elements in Shopping Spaces

Throughout history, the most basic form of lighting has been the illumination of the environment by taking daylight into the space. Natural light has been transferred into the space by architects and designers using windows, roof skylights and lanterns and lighting plans have been created accordingly [4].

Natural lighting systems should be designed with the aim of receiving sunlight into the interior space in the most efficient way. The most basic natural lighting element is the system where light is received through the openings created on the facades, that is, through the windows of the building. Roof lighting is the method of transferring light from the roof area of the building to the environment and distributing it into the space. The most basic example used in the method of natural lighting from the roof is roof skylights [5].

In terms of providing visual comfort in natural lighting applications, the amount of light received into the interior space is as important as the amount of light received in a controlled manner. This is because uncontrolled natural light can cause visual discomfort by causing glare and glare formation in the space and can cause thermal discomfort due to the heating effect of the sun in the space [6]. For these reasons, shading elements are frequently used in natural lighting systems against negative situations that may occur. In order to ensure maximum energy saving in buildings, control systems

should be established to ensure the integrated operation of the elements used in natural lighting and artificial lighting systems [7].

2.1.1 Facade Openings

It is known that traditionally designed and implemented façade openings create environments with excessive illumination in the front parts of the windows and little light if the depth of the space is high [8]. Since the facades of the stores inside the shopping centres are considered as display areas, the natural lighting system is generally provided by roof skylights.

2.1.2 Skylights

With the use of rooflights in shopping spaces, the lighting character of the building can be completely changed and it is seen that by positioning the rooflights in a section of 3/5 of the roof area, significant amounts of annual energy savings are achieved in the buildings by using the artificial lighting system very little during daylight hours [9].

Due to the fact that the stores in the shopping areas use the exterior areas of the stores as display areas, the traditional window system cannot be applied, and daylight is transferred into the space with the roof skylight applications created in the roof areas of the natural lighting system.

2.1.3 Shading Elements

As a result of intense and direct sunlight, which is one of the components of daylight, glare, high illuminance, and shaded areas can occur together. Shading elements help to create visual and thermal comfort by providing the opportunity to control direct and intense sunlight. With the help of these elements, heat gain can be controlled, and proper distribution of daylight indoors can be provided [10].

3. LIGHTING CRITERIA FOR SHOPPING CENTERS

In line with the researches conducted, lighting is the most fundamental element of the formation of the space atmosphere of shopping spaces. Since it is known that lighting conditions have psychological and physiological effects on users, it should be aimed to provide visual comfort by determining the lighting criteria suitable for the function during the design phase of the building.

The main criteria in shopping centers are to provide good visual conditions for the users, to reduce energy consumption to a great extent with the use of natural lighting, to create a place where they are in contact with the outdoor environment, to increase the preferability of the place and to increase the sales of the store. In this section, illuminance level, light color (color rendering, color temperature) and glare are examined as criteria to be considered in the examination of natural lighting applications in shopping centers.

3.1 TS EN 12464-1 Standard

According to this standard, the illuminance level of the stores in the shopping areas should be 300 lx, the color rendering index (Ra) of the artificial lighting elements should be minimum 80, the uniformity value (U₀) should be 0.4 and the glare index UGR value should be lower than 22. While evaluating the illuminance measurements of the common areas of the four shopping centers to be evaluated within the scope of the study, the 100 lux value recommended by the aforementioned standard and the International Commission on Illumination (CIE) for recreation areas was taken as the limit value [11].

3.2 EN 17037 Standard Assessment of Daylight In Interior Spaces, Daylight Provision;

3.2.1 General

Daylight can contribute significantly to the lighting needs of any type of building. This means that daylight openings should have appropriate areas to provide sufficient daylight throughout the year. Thus, the evaluation of daylight provision should make account of the availability of daylight at the site in the addition to accounting for the properties of the space (e.g. external obstruction, glazing transmittance, thickness of walls and roofs, internal partition and surface reflectance, furnitures).

3.2.2 Criteria for daylight provision

A space is considered to provide adequate daylight if a target illuminance level is achieved across a fraction of the reference plane within a space for at least half of the daylight hours [12].

In addition, for spaces with vertical or inclined daylight openings, a minimum target illuminance level is also to be achieved across the reference plane. The reference plane of the space is located 0,85 m above the floor, unless otherwise specified. A small fraction of the reference plane may be disregarded to account for singularities.

Values for target illuminances, minimum target illuminances and fractions of reference plane are given in Table 1.

Table 1. Recommendations of daylight provision by daylight openings in a horizontal surface

Level of recommendation for horizontal daylight opening	Target illuminance E_T lx	Fraction of space for target level $F_{\text{plane},\%}$	Fraction of daylight hours $F_{\text{time},\%}$
Minimum	300	95 %	50 %
Medium	500	95 %	50 %
High	750	95 %	50 %

4. ANALYSIS OF NATURAL LIGHTING SYSTEM DESIGN OF SELECTED SHOPPING MALL EXAMPLES WITHIN THE SCOPE OF FIELD STUDY

The relationship between different lighting conditions consisting of natural and artificial lighting conditions and the general illuminance level in the shopping centre interiors was examined with the illuminance level measurements made in Galleria Shopping Mall, Profilo Shopping Mall, Flyinn Shopping Mall and Cevahir Shopping Mall, which were selected as sample areas. Different functional areas in the sample shopping malls were determined and measurement points representing each area were selected. BENETECH GM1010 Digital Luxmeter was used as the measuring device and the illuminance level measurements at the selected measurement points were made on March 21, June 21, September 23 and December 21, which are the characteristic dates of the year.

After the measurements made in the field, a simulation model was created and a new natural lighting system proposal simulation was put forward in line with the findings obtained.

To create the simulation model;

1- All necessary measurements were taken with a laser meter and plans of four selected shopping malls were obtained from the shopping mall managements. (To create a base for three-dimensional modeling and lighting analysis programs.)

2- Through the Rhino program, a new 3D roof light model was prepared by creating 2 different types. It can be modeled in its own structure and has the ability to import drawings in different formats from other programs.

3- Climate Studio (Solemma) is a program that can import 3D models from the Rhino program. Through this program, natural lighting data can be obtained in detail by entering the necessary information of simulation models.

In the study, a new 3D rooflight model with 2 different layers designed in Rhino program was imported into Climate Studio program and natural lighting data were examined.

The light reflection, transmission and absorption properties of the materials used in the area were entered into the program as data, and natural lighting results were obtained using the real sun and sky model. The calculation results obtained are very close to reality.

- The results obtained from all necessary measurement points in all shopping mall samples were compared with each other. After the most inefficient use of the integration of artificial and natural lighting systems was determined, the new natural lighting system proposal that will provide maximum efficiency was put forward through the simulation program Climate Studio.
- In line with the illuminance level data obtained, the current situation and the second model of the skylight with low U-value, increased transmittance and double-layer were composed through the simulation program.

4.1 Natural Lighting Measurement Values of Selected Shopping Mall Samples

Galleria Shopping Center, Bakırköy (Figure 1): Galleria Shopping Center, designed and executed by Hayati Tabanlıoğlu, was opened in 1988 in Bakırköy as Turkey's first shopping center. The mall consists of six sections with a three-storey atrium and two five-storey parking lots, and has a total area of 130.000 m² on a 40.000 m² plot, with a shopping area of 62.000 m² with 143 stores and a parking lot of 67.000 m² [13].

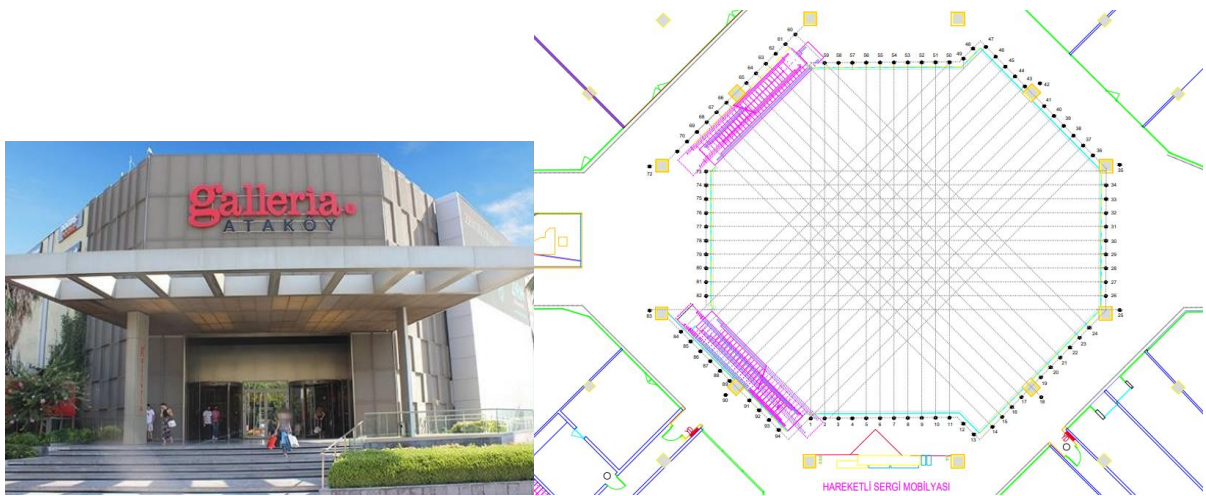


Figure 1. Galleria Shopping Mall Front Facade View and Ground Floor Common Circulation Area Measurement Points

The circulation area in Galleria Shopping Mall where natural lighting measurements were made is 735 m² in total and is located on the ground floor of the mall. Natural lighting measurements were made at 1 meter intervals from a height of 90 cm following the railings of the atrium area, and the illuminance levels taken on the days and hours of measurement are written separately in Table 2.

Table 2. Galleria Shopping Mall Natural Lighting Measurements

AVM	NATURAL LIGHTING MEASUREMENT						NATURAL LIGHTING MEASUREMENT					
	21.03.2022			21.06.2022			21.09.2022			21.12.2022		
GALLERİ A AVM	10.00	13.00	15.00	10.00	13.00	15.00	10.00	13.00	15.00	10.00	13.00	15.00
1	33,1	36,7	50,2	38,5	114,5	96,3	23,9	81,6	91,1	90,5	66,1	48,8
2	40,2	39,1	52,9	42,3	117,3	96,6	21,5	145,5	78,3	84,7	60,3	36,3
3	42,1	43,5	53,1	39,5	108,4	95,7	22,5	175,1	65,2	87,7	60,7	103,4
4	48,2	54,9	53,9	42,5	104,6	98,2	215,6	166,4	60,7	92,7	59,9	47,4
5	39,1	50,2	52,2	38,4	102,7	95,7	197,8	146,3	58,1	82,9	58,1	55,2
6	43,2	53,4	50,4	39,9	103,8	94,3	179,6	139,2	56,1	75,5	55,4	60,4
7	38,7	50,7	51,9	36,7	116,3	96,6	170,1	135,3	57,4	69,1	52,6	68,1
8	37,7	39,2	40,9	39,3	109,5	89,6	162,2	131,1	62,8	67,1	51,5	92,5
9	40,8	46,2	40,3	42,2	117,8	74,9	160,1	122,7	76,9	66,6	50,5	76,3
10	43,9	38,4	38,9	48,6	78,9	78,6	126,7	114,7	84,6	70,2	50,1	54,2
11	29,4	43,5	37,1	45,3	52,9	99,8	105,1	97,6	77,1	69,5	51,6	99,9
12	44,6	37,5	40,2	49,5	74,6	47,9	70,9	66,5	62,9	61,5	52,5	87,4
13	54,8	57,2	43,9	109,9	62,4	62,9	42,3	34,6	57,9	56,7	50,8	100,2
14	45,6	51,8	42,9	93,2	74,4	76,2	29,2	23,5	58,1	51,8	47,2	95,6
15	55,6	50,2	44,8	83	62,5	88,9	119,9	106,1	60,4	48,8	45,5	101,3
16	49,4	53,6	39,3	84,1	60,2	96,5	108,3	96,1	41,9	38,2	39,8	107,8
17	56,8	59,2	33,9	104,5	78,3	84,9	129,7	108,4	28,1	25,8	32,6	109,7
18	145,2	188,4	219,5	159,6	204,8	210,8	102,2	121,6	179,7	152,2	23,4	111,1
19	46,2	52,8	37,2	56,4	69,8	58,8	24,9	197,3	80,2	101,1	142,3	115,4
20	48,7	53,1	46,4	54,8	79,2	57,7	29,7	42,2	62,2	65,9	96,7	113,7
21	34,2	47,8	39,9	55,9	75,9	81,8	40,2	63,9	50,2	62,2	67,5	111,1
22	37,1	43,2	40,5	62,7	89,7	78,5	38,2	59,5	81,1	56,7	61,1	112,3
23	50,2	52,5	32,8	69,6	98,7	82,3	36,1	60,1	90,5	86,1	68,7	114,4
24	51,4	55,2	40,3	78,9	89,6	87,9	40,7	68,9	56,6	26,8	93,9	110,8
25	138,2	175,4	198,2	157,8	170,5	187,6	43,4	75,9	33,1	87,1	58,7	109,1
26	54,6	57,3	45,3	78,2	87,6	91,4	45,1	78,9	48,1	26,5	23,5	102,9
27	49,3	53,2	42,6	82,3	98,6	100,1	47,4	82,6	52,4	31,6	28,7	98,9
28	52,8	66,8	43	78,2	98,5	102,6	46,6	84,9	49,6	30,9	28,4	91,7
29	45,2	59,3	40,2	71,5	87,1	98,4	47,9	85,3	44,1	29,9	27,5	86,3
30	48,5	55,3	38,2	64,8	86,2	90,2	47,5	87,1	57,3	28,8	27,1	80,6
31	54,7	62,1	30,3	72,6	98,4	76,9	45,8	86,5	66,9	30,6	29,8	75,2
32	39,4	55,2	29,2	77,9	85,2	79,2	45,1	82,4	65,6	32,2	30,9	69,2
33	33,5	49,5	28,4	61,2	98,7	74,8	43,4	81,9	68,9	33,6	31,1	62,5
34	37,4	54,5	33,6	68,3	83,9	82,8	43,7	77,9	69,6	34,1	32,8	62,7
35	169,2	178,3	201,2	189,9	202,8	213,9	51,5	78,7	72,1	33,6	33,1	57,6

36	58,5	60,4	43,2	61,1	98,4	74,2	39,9	67,8	80,4	33,8	33,4	38,8
37	55,9	59,2	40,3	58,2	68,9	76,8	36,4	58,5	100,3	33,2	34,1	45,7
38	41,7	54,3	38,4	51,7	59,8	62,5	33,1	51,1	94,2	34,4	34,3	202,7
39	50,2	47,9	35,7	100,6	109,6	75,2	110,8	40,3	95,5	33,1	34,8	67,1
40	33,1	46,1	44,1	35,6	62,1	73,1	33,8	152,3	97,4	33,4	35,3	46,2
41	30,2	45,2	42,9	34,8	67,4	74,7	34,8	128,4	95,3	32,2	34,8	44,7
42	98,3	149,2	163,2	101,4	138,7	148,2	33,2	39,4	106,6	31,1	35,3	56,2
43	32,5	42,3	35,8	27,6	46,6	78,3	31,5	40,3	107,8	28,9	33,9	215,3
44	37,8	48,5	38,9	54,1	58,9	79,4	105,7	38,5	106,1	28,3	34,3	27,5
46	43,8	53,6	36,1	56,2	69,8	78,9	157,8	37,6	128,2	26,2	33,5	39,6
47	49,7	59,3	40,7	53,3	57,3	68,4	40,9	39,4	147,7	33,2	34,5	46,2
48	48,1	56,3	43,4	54,6	66,8	66,2	41,5	37,8	169,2	25,8	40,1	45,6
49	45,9	54,2	40,3	54,8	55,2	72,2	43,1	36,5	158,1	160,3	22,8	47,6
50	40,3	57,2	39,3	55,7	61,2	61,8	43,9	115,6	134,2	124,2	178,6	46,4
51	42,8	48,9	38,1	58,8	64,1	62,9	49,4	128,3	214,7	90,2	83,9	46,7
52	47,1	51,8	37,9	57,9	62,1	63,1	50,4	59,5	187,4	107,2	188,3	45,7
53	38,7	53,8	35,7	44,6	68,2	58,7	49,7	65,4	209,2	150,1	206,5	44,5
54	39,5	59,3	32,1	55,6	69,2	73,2	49,4	68,2	21,4	144,5	201,4	42,7
55	35,1	49,5	31,3	53,5	71,9	71,6	57,8	70,8	23,5	145,7	191,1	41,4
56	38,4	46,1	32,8	42,7	52,8	72,4	56,2	74,1	25,8	143,4	189,2	39,6
57	37,8	45,2	32,2	45,8	55,2	74,8	68,6	76,8	28,3	143,7	179,1	40,7
58	42,9	43,8	48,1	38,7	48,6	75,1	158,1	80,2	28,7	138,1	184,5	41,1
59	43,6	52,4	46,4	47,9	54,9	75,4	86,2	80,9	179,6	73,4	72,9	41,6
60	88,5	92,4	109,3	93,5	98,7	145,3	100,6	81,8	143,8	78,4	55,5	40,7
61	80,2	98,3	112,1	88,2	112,3	148,9	105,6	52,2	26,9	115,7	31,4	35,6
62	83,2	87,4	113,9	89,5	97,2	152,6	117,3	165,5	24,5	207,5	34,2	31,6
63	86,3	90,4	119,3	92,7	98,4	155,8	135,9	84,1	24,7	212,1	37,1	170,1
64	84,2	89,3	125,8	86,5	97,5	156,9	127,6	91,8	23,7	23,1	38,2	120,2
65	90,2	94,2	127,5	93,9	96,3	149,7	63,3	99,6	22,9	29,7	40,2	98,1
66	92,4	94,9	132,9	109,1	98,1	147,1	162,2	113,2	22,5	23,8	40,5	65,1
67	91,1	95,7	128,4	108,8	100,2	138,9	150,7	126,1	21,8	25,1	40,3	55,4
68	93,1	104,2	145,6	96,2	96,3	138,1	162,2	158,3	20,5	25,7	41,8	55,7
69	94,2	100,6	107,4	105,3	107,4	118,5	186,8	147,2	202,4	26,9	43,6	91,1
70	98,2	106,6	115,3	106,9	109,5	121,8	22,1	36,9	192,4	25,5	43,9	157,8
71	89,3	96,3	108,3	96,3	98,2	116,9	24,3	46,7	171,6	26,3	45,7	202,3
72	135,4	158,2	159,4	159,1	169,5	112,8	30,7	51,5	163,6	22,8	41,1	25,9
73	34,6	74,3	48,2	51,1	112,4	33,3	35,5	55,8	152,6	95,4	100,8	24,9
74	31,1	56,5	33,1	41,6	54,3	43,5	41,1	58,4	123,3	130,3	148,9	23,1
75	33,2	58,2	29,3	42,4	52,9	33,6	46,3	57,9	119,9	23,8	31,1	25,7

The values above 100 lx were coloured in Table 4.1. The existing roof skylight designed for Galleria Shopping Mall is located at a total height of 23 meters from the ground floor, and metal and semi-transparent glass materials are preferred as construction. During the measurements, it is thought that

the natural lighting received from the roof skylight into the interior space does not provide maximum efficiency during the periods when natural lighting measurements were made at selected times.

Flyinn Shopping Center, Florya (Figure 2 and 3): Flyinn Shopping Center opened its doors to visitors in Florya on December 21, 2003 as the first shopping center with panoramic view in Turkey. Designed by Murat Tabanlıoğlu. Flyinn Shopping Mall is built on a total land area of 5.500 m² and a construction area of 38.500 m² with 78 stores, 6 cinemas, a fast food court, an entertainment center for children and circulation areas [14].



Figure 2. Flyinn Shopping Center Front Facade View [14].

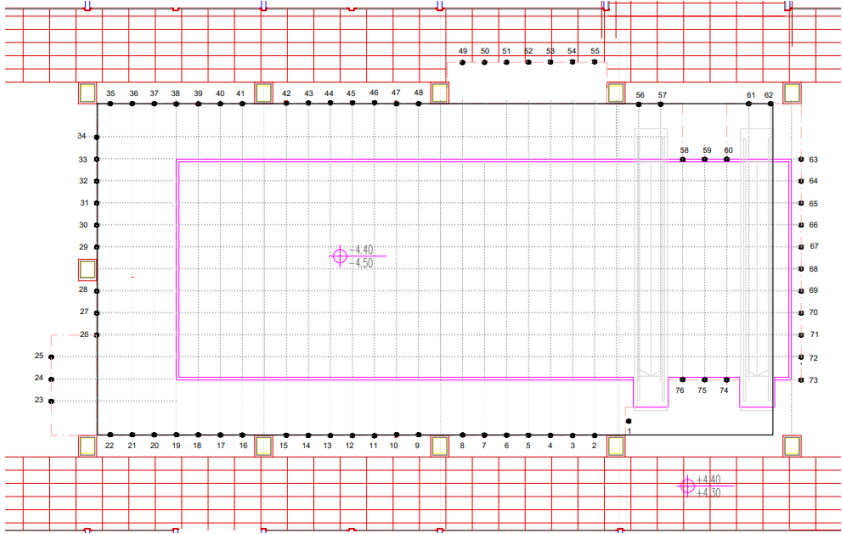


Figure 3. Flyinn Shopping Mall Ground Floor Common Circulation Area with Natural Lighting Measurement Points

The most important feature that distinguishes Flyinn Shopping Mall from other shopping centres is the design of a large opening on the facade facing Atatürk Airport, which provides both a panoramic view of the mall and natural lighting into the interior space from this facade. In addition, in order to ensure the sustainability of the building, eating-drinking, resting and terrace areas were designed for the users of the shopping centre on this façade, and areas where the psychological and physiological comfort of the users were given importance were created. The existing roof skylight in the building is preferred as a metal construction and transparent glass material in order to benefit from maximum natural lighting

in the interior, and metal lamellas that can rotate manually and according to the position of the sun are used as shading elements.

The circulation area where natural lighting measurements were made in Flyinn Shopping Center is 475 m² in total and is located on the ground floor of the shopping center. In Table 3, the illuminance measurements taken on the days and hours of measurement are written separately and values above 100 lx are coloured.

Table 3. Flyinn Shopping Mall Natural Lighting Measurements

AVM	NATURAL LIGHTING MEASUREMENT						NATURAL LIGHTING MEASUREMENT					
	21.03.2022			21.06.2022			21.09.2022			21.12.2022		
FLYINN AVM	10.00	13.00	15.00	10.00	13.00	15.00	10.00	13.00	15.00	10.00	13.00	15.00
1	60,9	68,3	79,9	42,4	87,1	116,4	28,1	25,7	38,4	38,2	40,2	51,2
2	34,5	38,9	43,4	31,7	43,4	23,9	22,2	192,1	40,8	23,7	42,2	55,2
3	33,2	41,6	44,6	29,5	32,3	49,2	21,5	159,2	156,4	195,3	29,3	38,7
4	35,6	43,8	44,7	32,9	41,7	48,3	21,3	115,6	137,7	178,3	21,5	26,8
5	32,1	38,9	45,7	45,2	40,6	44,3	170,3	121,9	141,1	169,3	171,1	213,6
6	35,8	42,7	43,6	33,8	48,8	53,4	150,1	147,1	159,2	174,1	173,2	181,5
7	30,5	38,6	42,8	35,7	42,8	45,5	169,3	110,3	126,3	165,2	182,1	140,6
8	32,6	33,8	40,3	23,7	40,8	48,5	148,6	117,3	121,8	188,5	181,4	194,6
9	28,5	37,9	42,4	40	37,9	42,8	123,8	115,8	118,5	134,1	177,9	200,8
10	27,6	35,9	39,4	21,8	33,6	40,9	25,4	115,1	114,8	151,5	169,8	199,1
11	25,5	34,6	37,5	31,1	41,5	48,5	25,6	114,1	108,4	116,1	183,7	193,4
12	29,5	37,6	43,5	35,9	40,8	46,9	26,9	117,7	29,1	153,1	189,3	202,5
13	32,6	39,6	42,6	40,5	44,6	46,3	27,7	115,2	74,4	29,8	201,1	192,9
14	35,8	43,7	45,7	38,5	40,3	44,9	26,2	52,8	76,4	66,9	23,7	197,1
15	37,8	47,6	43,5	40,3	29,6	46,8	21,4	37,1	37,2	81,2	21,9	56,9
16	29,5	34,8	40,4	32,3	37,6	43,2	155,2	208,4	30,8	96,8	152,1	193,9
17	27,5	36,8	39,5	34,5	30,7	46,8	161,2	23,9	23,6	113,2	186,6	216,7
18	24,6	34,6	40,4	36,9	38,4	43,9	166,4	127,7	122,6	115,4	174,6	200,8
19	26,8	32,8	35,9	32,4	36,8	41,8	166,8	126,4	114,8	112,2	140,1	162,5
20	32,6	31,5	36,6	33,5	33,5	39,6	159,2	134,9	118,3	111,3	129,8	144,6
21	30,7	34,7	36,3	37,4	32,6	42,8	164,7	127,7	120,9	101,2	148,6	160,5
22	29,7	33,4	37,1	36,8	37,5	45,2	170,1	143,1	117,2	91,8	28,5	105,1
23	136,8	123,6	139,4	170,5	176,9	165,4	192,7	113,8	113,2	78,4	66,2	213,1
24	143,5	146,9	149,9	180,8	199,3	178,6	177,7	104,8	109,4	73,8	92,1	24,4
25	167,4	154,3	161,6	209,6	218,9	169,6	166,1	96,2	81,3	51,4	104,3	184,2
26	32,5	34,6	42,4	38,6	41,8	45,6	168,7	82,1	55,5	52,2	112,8	180,1
27	29,2	36,6	41,8	33,5	37,9	43,8	162,4	81,9	32,7	30,9	111,9	142,1
28	31,5	38,9	43,1	32,6	43,8	48,6	159,5	116,7	24,1	26,2	108,1	150,4
29	33,6	39,2	42,5	35,5	41,8	46,2	169,9	196,8	131,1	182,4	103,2	162,1

30	25,8	34,4	36,3	28,5	36,8	49,7	172,8	53,7	152,6	177,7	86,6	151,3
31	35,6	39,5	39,1	37,9	40,7	44,3	175,4	62,4	164,1	24,1	155,7	171,3
32	32,1	40,3	41,2	32,4	44,6	49,2	182,9	63,8	23,8	27,4	64,9	161,2
33	28,5	36,4	38,5	34,7	38,5	43,4	165,9	73,2	24,9	26,9	47,3	165,3
34	29,4	35,4	33,5	30,5	37,1	44,6	197,3	74,6	25,7	28,7	75,1	157,8
35	30,6	37,5	39,5	36,7	39,2	47,6	219,9	76,1	26,5	25,9	29,4	155,1
36	32,5	39,5	43,5	42,6	45,9	56,8	38,2	74,9	181,1	168,5	36,2	158,8
37	28,6	36,9	41,5	46,8	52,7	58,9	39,2	75,5	185,4	212,7	90,3	141,8
38	27,6	33,6	44,6	44,9	54,6	62,8	41,3	73,6	189,8	210,9	73,8	152,1
39	32,2	35,4	43,6	37,9	55,9	66,3	40,3	63,6	162,4	22,3	42,8	162,8
40	33,4	39,4	42,8	45,8	49,5	69,7	41,3	51,8	190,3	23,6	162,6	205,8
41	31	35,7	46,7	48,6	56,7	57,3	36,2	42,8	194,3	25,3	187,2	40,5
42	34,9	41,5	45,6	47,2	60,9	61,5	35,1	191,4	189,4	192,1	23,3	41,6
43	34,2	42,9	48,4	49,4	57,9	64,9	33,5	29,8	179,8	22,7	70,8	43,7
44	31,5	36,4	43,5	39,7	56,3	61,6	31,9	125,6	184,8	173,5	154,4	40,2
46	28,6	33,6	46,1	37,4	43,6	47,7	27,8	26,8	189,6	23,6	28,4	39,2
47	36,4	38,1	42,7	47,9	54,8	58,7	23,9	24,5	160,4	198,8	25,3	35,3
48	34,9	45,6	48,9	45,6	65,8	67,9	24,1	26,9	179,1	195,9	44,7	32,6
49	112,5	128,5	139,6	144,6	150,3	165,4	29,7	24,9	23,6	137,9	44,2	31,1
50	132,6	143,4	141,4	159,7	167,3	159	36,1	27,7	31,1	191,6	41,5	39,2
51	137,6	156,7	153,5	164,6	178,3	188,2	37,2	24,1	76,2	201,1	40,2	51,8
52	141,6	169,6	167,3	170,6	189,3	198,7	35,5	189,7	59,3	36,5	38,1	59,3
53	148,5	152,5	163,6	173,6	192,3	208,3	32,2	197,5	123,1	38,2	37,4	67,4
54	134,6	143,8	172,4	179,5	188,4	178,4	29,5	176,8	56,1	36,9	30,4	71,9
55	124,7	134,5	143,6	168,6	190,4	167,7	27,9	23,1	86,4	33,2	33,5	66,8
56	66,8	79,8	75,4	84,6	98,4	87,3	27,7	28,3	52,4	24,1	49,9	54,1
57	68,3	82,4	67,4	99,7	109,4	90,2	25,6	34,6	69,1	29,6	51,8	47,1
58	57,8	68,5	62,4	45,9	48,3	65,3	23,5	36,9	40,7	27,1	46,8	40,5
59	48,5	52,4	48,4	53,9	49,5	56,7	209,2	34,2	47,9	200,5	40,2	38,9
60	46,3	49,5	54,5	50,4	39,3	65,7	213,1	31,1	55,5	29,2	34,4	36,1
61	67,8	73,5	68,9	75,3	89,4	67,5	193,6	263,3	54,6	36,5	23,7	22,3
62	69,4	76,4	79,4	87,5	92,4	95,3	174,4	210,2	44,5	37,7	28,1	31,2
63	63,1	68,4	72,7	78,4	87,3	98,4	147,3	179,2	37,1	22,4	25,4	28,9
64	54,8	58,4	68,9	65,3	78,1	82,4	134,2	164,8	31,5	23,6	23,1	25,9
65	46,9	53,5	59	67,1	74,4	88,5	113,2	157,8	29,1	200,9	179,4	23,2
66	52,8	63,7	66,8	65,3	85,3	94,6	143,1	136,6	26,7	22,3	150,4	25,4
67	45,4	49,4	56,9	76,9	84,3	87,5	163,4	111,2	24,8	184,6	180,6	24,1
68	59,5	63,2	61,5	81,9	98,4	108,5	170,8	148,5	203,7	173,6	183,7	34,7
69	68,9	74,3	78,4	84,2	106,4	113,3	26,3	131,3	163,2	153,2	27,8	46,4
70	62,7	58,9	62,7	88,9	89,9	95,3	29,5	26,4	185,5	134,2	35,5	55,6
71	67,3	62,3	69,2	95,2	98,4	109,4	31,4	29,2	200,4	212,5	39,6	58,4

Cevahir Shopping Mall, Şişli (Figure 4): Cevahir Shopping Mall, designed by American architect Minoru Yamasaki, was constructed by Cevahirler Project Design Center and opened in Şişli in 2005. It is thought to be the second largest shopping center in the world and the largest shopping center in Turkey, with a total land area of 62,475 m², six floors and 324 stores, 348,299 m² shopping area, 71,016 m² parking area for 2500 vehicles and 420,000 m² building area.

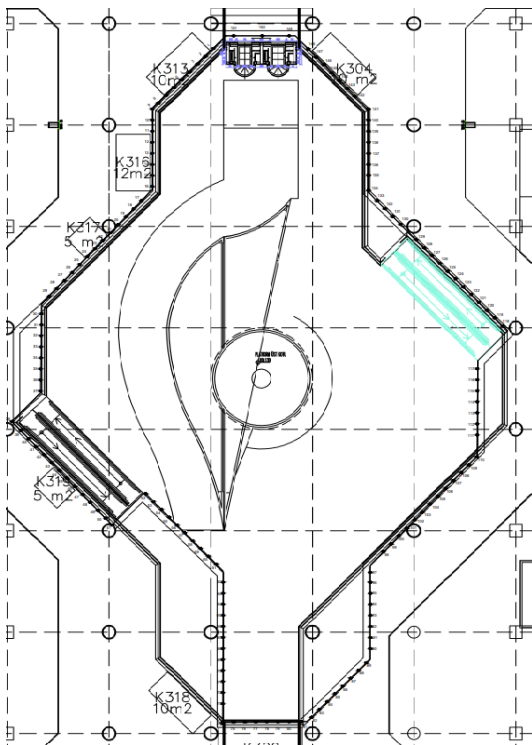


Figure 4. Cevahir Shopping Mall Front Facade View and Plan Area with Natural Lighting Measurement Points

The existing roof skylight in the shopping center is made of glass pyramids, metal construction and transparent glass material were preferred in order to benefit from maximum natural lighting in the interior space, and when examined, no shading elements were seen on it. Due to the fact that the glass material used in the roof skylight is completely transparent glass, air conditioning devices are in constant operation in order to keep the heat that may occur in the volume at the desired level.

The circulation area in Cevahir Shopping Center where natural lighting measurements were made is 1140 m² in total and is located on the ground floor of the shopping center and is named as the 4th floor in the shopping center. In Table 4 below, the illuminance level measurements taken on the days and hours of measurement are written separately.

Table 4. Cevahir Shopping Mall Natural Lighting Measurements

AVM	NATURAL LIGHTING MEASUREMENT						NATURAL LIGHTING MEASUREMENT					
	21.03.2022			21.06.2022			21.09.2022			21.12.2022		
CEVAHİR AVM	10.00	13.00	15.00	10.00	13.00	15.00	10.00	13.00	15.00	10.00	13.00	15.00
1	143,2	113,6	104,3	117,1	163,6	98,8	64	66,1	48,2	49,9	51,8	41,4
2	189,3	128,3	154,2	192,3	24,7	143,3	91,5	90,2	72,4	85,6	74,1	67,4
3	210,4	106,4	169,4	202,9	24,9	159	121,8	95,5	100,5	94,3	75,4	71,1
4	219,2	98,4	172,4	207,9	27,4	166,6	118,1	89,3	107,5	31,6	76,9	70,3
5	209,3	86,3	176	196,8	26,8	158,1	105,2	83,3	73,5	100,9	80,9	78,7
6	209	78,5	182,1	204,1	40,8	154,8	130,8	109,4	138,5	94,7	78,4	73,6
7	198,3	26,4	178,3	183,4	38,9	165,7	95,4	101,9	135,9	91,1	81,3	66,5
8	215,2	24,6	168,3	202,4	34,8	153,9	119,7	110,8	126,5	102,8	184,9	180,7
9	188,5	27,8	172,4	179,4	35,6	160,4	119,9	112,1	90,5	96,1	90,1	73,6
10	22,5	24,5	154,3	29,5	46,9	148,7	99,7	147,7	148,6	94,7	91,5	67,2
11	23,5	27,7	176,4	28,7	51,7	164,8	146	158,1	154,9	86,8	72,2	63,1
12	24,2	30,5	194,3	36,5	56,8	183,9	143,2	95,3	163,1	98,4	95,4	74,6
13	34,7	129,4	188,4	38,5	102,6	178,5	169,5	202,6	177,9	82,7	117,9	72,4
14	48,9	119,8	216,3	38,1	108,6	204,1	178,8	22,5	194,8	96,7	108,9	83,6
15	38,5	25,3	154,2	36,7	43,3	125,9	21	22,1	20,3	106,7	125,9	85,9
16	27,4	202,4	21,5	36,8	196,6	32,6	21,7	23,5	20,9	119,1	131,3	101,1
17	27,5	132,4	22,3	38,1	111,6	26,5	22,2	26,3	195,7	119,8	137,5	105,9
18	24,5	32,4	20,3	36	41,1	26,3	21,3	28,3	23,7	32,1	42,3	48,7
19	90,5	166,4	24,5	36,2	155,8	36,2	208,9	30,8	23,2	138,6	133,8	143,5
20	92,6	78,4	23,4	37,2	48,9	28,4	203	35,8	26,9	143,4	127,3	112,8
21	109,6	76,4	21,4	30,5	98,9	26,3	204,1	49,4	129,1	145,6	136,6	124,9
22	98,5	87,5	22,3	22,8	43,8	27,1	196	104,8	44,6	46,2	43,2	77,3
23	87,4	95,6	21,3	30,4	90,9	26,1	198,4	110,2	94,2	83,2	62,8	96,3
24	90,3	98,3	26,2	37,1	75,2	35,9	188,2	180,7	69,5	147,1	128,9	125,9
25	80,2	115,3	78,4	36,4	74,3	25,2	201	103,6	48,7	138,8	125,8	120,8
26	23,4	117	65,3	35,6	71,4	23,5	21,3	44,2	44,2	106,2	116,6	139,4
27	21,1	125,5	26,4	38,2	63,7	34	204,8	45,4	72,1	137,1	95,7	131,3
28	28,3	34	30,4	34,6	45,7	37,4	207,3	52,3	156,2	146,1	156,8	126,8
29	178,4	36,6	32,5	168,8	43,8	38,8	206,1	166,5	86,8	160,3	138,9	122,2
30	169,3	28,3	23,7	168,2	33,9	28,1	166,7	176,1	144,4	134,9	129,6	123,1
31	187,9	20,4	68,4	164,7	28,3	77,2	133,1	95,3	166,5	135,9	124,2	121,1
32	179,4	24,5	78,3	163,4	30,5	87,1	119,4	197,7	85,6	76,4	80,6	93,6
33	178	22,1	56,4	150,7	37,3	46,9	102,3	118,5	72,1	106,1	95,6	122,8
34	187,4	21	38,4	153,6	28,7	35,8	101,4	63,4	171,6	126,5	79,1	103,7
35	205,2	26,4	29,4	162,5	35,5	38,9	104,2	148,1	90,5	121,6	80,6	117,3

36	208,1	28,4	24,6	168,4	43,5	31,9	99,1	82,9	131,7	112,1	97,6	122,4
37	202,3	217,4	25,3	159,3	195,5	32,6	98,2	68,3	200,2	103,5	96,5	111,4
38	156,3	209,3	167,3	117,8	199,1	155,9	97,9	113,7	36,6	66,8	92,1	131,1
39	143,5	218,9	173,5	121	196,3	149,7	93,8	37,9	159,3	87,8	91,5	119,1
40	128,2	216,3	177,1	118,3	207,7	156,3	82,7	66,2	40,3	86,9	91,6	101,6
41	134,3	210	183,2	105,8	202,9	152,3	74,1	25,5	147,7	85,9	105,2	93,1
42	134	218,4	145,3	105	204,1	131,2	111,9	121,8	183,1	182,7	198,5	194,1
43	143,5	222,5	125,2	98,6	206,2	115	94,4	172,4	162,7	86,8	96,6	81,2
44	142,5	207,4	118,4	86,6	188,5	106,7	89,4	144,7	141,7	95,6	116,8	90,5
46	68,4	205	104,3	27,1	178,6	83,7	108,1	127,6	128,4	95,2	39,9	89,8
47	105,2	198,3	78,4	36,5	169,2	69,1	105,4	61,9	100,9	31,1	103,9	195,1
48	165,3	178,1	128,9	42,3	156,3	116,7	65,5	92,3	94,6	162,8	192,2	194,3
49	161,3	165,3	94,2	48,3	125,6	89,4	62,4	109,6	131,2	90,5	74,2	92,6
50	158,3	90,4	87,4	47,1	80,1	76,5	80,1	29,7	74,5	93,5	51,6	90,5
51	164,3	139,5	78,3	54,1	143,8	60,3	134,9	67,2	95,7	98,2	58,6	88,1
52	27,4	134,5	89,4	56,2	121,9	65,3	23,2	201,2	139,7	184,5	84,2	176,4
53	23,9	21,3	92,5	53,2	26,6	55,8	28,1	30,5	82,2	66,1	87,9	71,1
54	29,5	89,3	93,7	51,1	190	54,5	122,9	100,8	85,5	50,3	83,3	72,3
55	24,6	98,4	104,3	48,6	28,7	57,8	126,3	35,9	96,2	111,2	193,4	65,6
56	26,3	139,4	76,3	47,3	124,4	53,8	107,1	36,2	203,5	128,7	20,9	57,3
57	27,5	143,2	78,1	48,9	127,4	65,7	27,3	24,2	36,5	22,1	38,9	42,9
58	33,5	189,5	86,4	45,6	172	62,8	22,8	28,5	62,5	26,9	30,4	36,6
59	31,3	78,4	88	44,7	21,3	64	121,1	32,2	48,3	29,4	29,8	31,3
60	38,6	75,4	92,3	42,8	122	58,3	177,2	165,4	38,2	37,5	32,3	132,9
61	37	68,4	78,4	40,7	28	43,6	30,4	116,2	30,7	43,7	33,3	33,9
62	54,9	21	108,3	45,9	27,8	38,7	26,7	23,4	24,7	95,7	31,8	34,5
63	51,9	23,4	64,1	44,9	34,3	48,7	27,7	23,6	22,3	34,5	33,1	48,7

Profilo Shopping Center, Mecidiyeköy, (Figure 5): The former Profilo Factory was redesigned by Utarit İzgi and opened as Profilo Shopping Mall in Mecidiyeköy in 1998. The shopping center has a total construction area of 110.000 m² on a 20.000 m² land area with 5 floors and 201 stores, 100.000 m² shopping area and 10.000 m² parking lot area for 1500 vehicles [15].

Natural lighting is provided up to the ground floor with a roof skylight using matte glass that continues along the gallery spaces, and the heat of the sunlight is tried to be prevented with the use of this material. In addition to the roof skylight, mirrored glass used on the entrance façade is also used to benefit from natural lighting. The ceilings are made of plasterboard and metal suspended ceilings, and the corridors with very low ceilings are covered with mirrors to make them feel higher. Matte gray granite was used for flooring, and square patterns were designed using pink, gray and white granite in the areas where the squares are located.

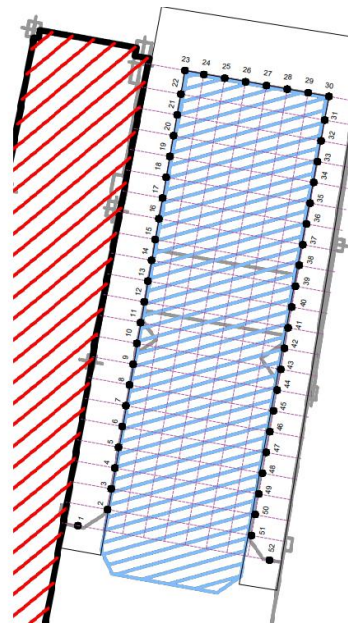


Figure 5. Profilo Shopping Mall Front Facade View and Plan Area with Natural Lighting Measurement Points

When all the measurements are evaluated for the 4 shopping center buildings, according to the results of the illumination level measurements; Profilo Shopping Center needed more artificial lighting support than the other buildings, and it is thought that the existing roof skylight cannot provide enough natural lighting support for the interior space. Table 5 shows the natural lighting measurements of Profilo Shopping Center and values above 100 lx are coloured.

Table 5. Profilo Shopping Mall Natural Lighting Measurements

AVM	NATURAL LIGHTING MEASUREMENT						NATURAL LIGHTING MEASUREMENT					
	21.03.2022			21.06.2022			21.09.2022			21.12.2022		
PROFILO AVM	10.00	13.00	15.00	10.00	13.00	15.00	10.00	13.00	15.00	10.00	13.00	15.00
1	103,9	41,7	46,3	35,9	58,9	49,3	46,8	35,4	28,1	28,1	67,3	94,3
2	100	106,5	123,4	111,3	24,3	126,7	139,3	87,5	63,9	57,3	63,9	60,9
3	82,6	94,6	134,3	130,9	35,8	143,6	23,8	168,2	102,5	75,7	84,1	79,9
4	131,8	94,3	95,1	126,5	36,4	117,5	25,6	185,7	118,1	83,6	97,2	90,1
5	26,5	88,2	127,7	128,2	23,8	113,3	26,5	190,7	126,9	90,6	106,4	104,1
6	29,6	106,2	145,7	122,3	33,4	126,1	23,6	181,7	110,2	97,1	102,5	105,8
7	31	107,2	117,2	108,8	22	117,7	21,6	153,8	112,5	84,2	108,1	99,9
8	38,8	78	118,1	142,4	28,6	115,4	21,1	147,5	102,6	72,5	95,7	84,2
9	34,3	56,6	107,3	131,6	35,5	133,4	22,6	156,5	98,4	71,7	100,8	75,7
10	70,2	88,2	106,4	126,6	35,6	141,4	25,7	173,1	103,4	70,2	105,7	72,8
11	26,5	76,5	110,3	123,7	25	115,7	25,4	165,2	99,1	66,9	111,4	66,1
12	64,1	86,2	69,6	66,9	113,5	83	23,1	187,5	75,5	66,7	97,3	51,6
13	40,8	98,6	67,5	80,2	191,8	50,8	21,4	198,4	58,1	62,9	82,9	74,3

14	66,7	93,4	59,6	109	27,6	85,1	23,8	203,2	167,7	175,2	172,5	182,1
15	105,2	100,5	80,2	110,1	21,9	113,9	26,5	170,3	65,9	185,8	164,2	187,2
16	41,1	68,9	101,3	115	23,4	97,3	28,1	121,2	70,5	85,9	71,1	77,5
17	106,1	117,8	85,2	145,3	35,4	95	27,3	97,4	186,1	73,5	173,4	180,4
18	122,9	65,7	78,4	157,9	36,1	117,3	27,4	95,5	92,1	66,2	72,7	70,7
19	41,6	37	84,3	160,8	35,4	127,7	23,1	129,9	95,9	56,2	75,6	59,7
20	126	63,2	65,7	164,4	34,4	138,2	163,6	149,7	102,2	56,1	84,4	47,6
21	110,4	57,8	71,8	135,3	30,3	125,4	113,3	163,1	112,3	124,4	119,8	160,7
22	149,5	54,6	84,9	147,8	31,6	126,1	103,1	158,1	120,1	120,4	156,3	175,3
23	178,4	53,2	78,5	170,6	37,5	108,6	154,2	161,2	114,2	134,8	140,9	155,4
24	168,5	67,9	82	181,7	45,2	112,1	190,6	176,5	112,1	59,5	85,5	74,2
25	183,1	87,3	87,4	172,9	46,4	121,2	203,7	189,9	134,3	61,8	80,6	69,3
26	148,4	78,9	90,3	177,3	48,2	143,8	23,1	195,5	140,5	121,4	164,1	178,5
27	118,5	65,3	47,8	145	40,5	130,8	23,4	202,3	143,2	105,5	164,3	177,4
28	97,5	59,2	55,3	119,2	33,5	140,3	23,8	205,8	148,6	138,5	158,4	183,1
29	114,6	72,5	59,5	145,5	29,2	123,3	22,5	178,6	153,5	77,6	38,9	82,3
30	166,7	76,3	65,4	149,4	31,9	97,8	28,3	21,3	144,7	79,8	26,9	84,2
31	158,9	65,6	59,3	148,3	32,4	121,3	29,2	23,5	142,5	129,9	133,5	181,8
32	145,8	56,2	54,2	138,8	28,1	138,1	29,3	25,6	158,5	79,8	55,4	82,9
33	135,7	69,3	64,6	154,9	21,5	146,1	28,8	25,8	83,1	85,6	166,8	189,4
34	178,5	56,4	54,7	189,1	27,4	131,6	29,5	29,4	59,7	93,4	182,4	184,6
35	176,3	77,8	69,4	199	34,3	116,8	29,1	25,4	99,7	102,8	80,3	100,4
36	142,7	67,9	90,4	164,5	31,1	156,7	24,1	27,6	109,2	107,1	89,9	87,8
37	95,7	35,7	132,5	89,5	22,5	170,3	26,5	23,2	189,3	89,5	86,5	91,1
38	68,8	93,5	48,7	60,7	113	150,3	27,7	21,1	211,7	145,5	134,9	194,8
39	78,9	105,5	56,4	162,1	131,8	104	28,4	25,9	22,4	94,8	74,5	102,8
40	54,8	87,4	27	21,7	28,9	54,7	27,2	196,1	23,2	97,9	75,6	96,6
41	69,6	65,2	49,4	22,6	33,7	93	24,1	152,6	24,1	87,7	73,1	100,6
42	149,3	71,4	71,5	156,3	33,5	155,6	22,2	145,2	24,5	62,8	81,4	106,3
43	119,5	69,4	65,3	103,5	21,1	168,5	21,2	188,4	25,4	60,4	88,9	99,8
44	109,6	80,4	101,4	133,8	23,9	175,2	199,1	65,9	93,5	166,2	160,1	184,7
46	125,8	77,3	81,2	127,9	27,9	134,7	168,8	68,1	23,1	73,7	183,6	174,3

5. EVALUATION OF THE MEASUREMENTS OF SELECTED SHOPPING MALLS AND PROPOSING A NEW HORIZONTAL OPENING

After comparing the results obtained from all the necessary measurement points in all shopping mall samples, it was seen that Profilo Shopping Mall needs more daylight, so a new natural lighting system proposal that will provide maximum efficiency was put forward through the simulation program Climate Studio Program.

In line with the illuminance level data obtained through measurements, the current situation was modelled first. Then, a new proposal with triangular form was proposed. Two different types of glazing layers are used for both the current and proposed form. These different types of glazing are one-layer glazing and double-layer glazing with low U-value. By these different trials, an efficient skylight system was tried to be revealed. For the method, 3D models of Profilo Shopping Mall were

created in Rhino program and natural lighting simulation data were obtained using Climate Studio Program (Figure 6).



Figure 6. The current (A) and proposed (B) skylight systems

5.1 Simulation of Existing Design (A)

Natural lighting simulation data were obtained for the current situation using the Climate Studio Program (Figure 7, 8 and 9).

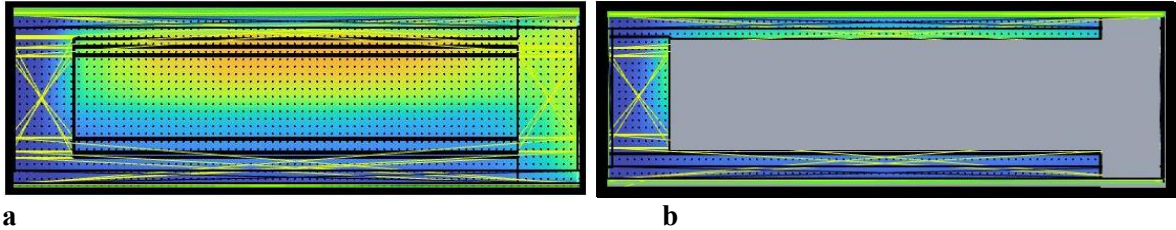


Figure 7. Profilo Shopping Mall Current Status Ground Floor (a) and First Floor Simulation Data (b)

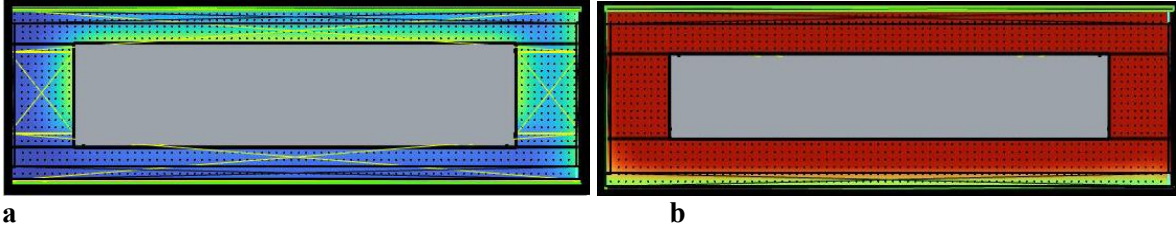


Figure 8. Profilo Shopping Mall Current Status Second Floor (a) and Third Floor Simulation Data (b)

	Fail	Minimum	Medium	High
Target Level	%0,0	%2,0	%1,6	%96,4
Minimum Level	%0,0	%10,0	%5,0	%85,0

Figure 9. Profilo Shopping Center Current Status Analysis for All Floors

As evaluation of Figure 9, for all floors the target illuminance level for high performance is provided but minimum illuminance level cannot be provided. To provide the required levels both for the target and minimum illuminance, values should ensure to be higher than %95 (Table 1).

Double Layer Glazing Analysis of Existing Design (A)

Using the Climate Studio Program, natural lighting simulation data were obtained with low U-value, double-layered glass (Figure 10, 11 and 12).

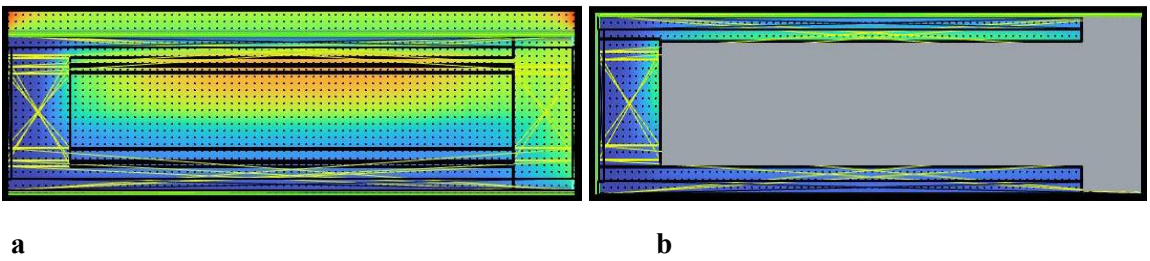


Figure 10. *Profilo Shopping Mall Current Status Ground Floor (a) and First Floor Simulation Data (b)*

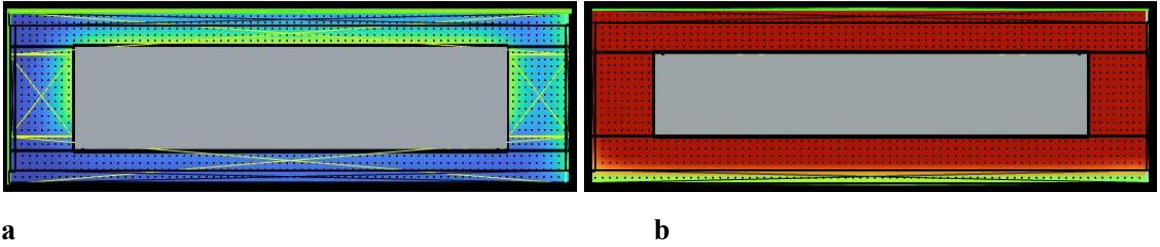


Figure 11. *Profilo Shopping Mall Current Status Second Floor (a) and Third Floor Simulation Data (b)*

	Fail	Minimum	Medium	High
Target Level	%0,0	%2,0	%1,6	%96,4
Minimum Level	%0,0	%8,3	%6,6	%85,0

Figure 12. *Profilo Shopping Center Current Form with Double Layer Analysis for all Floors*

As evaluation of Figure 12, for all floors the target illuminance level for high performance is provided but minimum illuminance level cannot be provided. To provide the required levels both for the target and minimum illuminance, values should ensure to be higher than %95 (Table 1).

5.2 New Triangular Type Skylight System Proposal (B)

Through the Climate Studio Program, natural lighting simulation data of new triangular shaped skylight was obtained, and it was aimed to acquire high daylighting values (Figure 13, 14). Firstly, double-layer glazing with low U value is simulated and checked. But, it is seen that required illuminance levels referred by EN 17037 (Table 1) is not obtained. In the line of this study the one-layer glazing is calculated, and the values are obtained as seen in Figure 15.

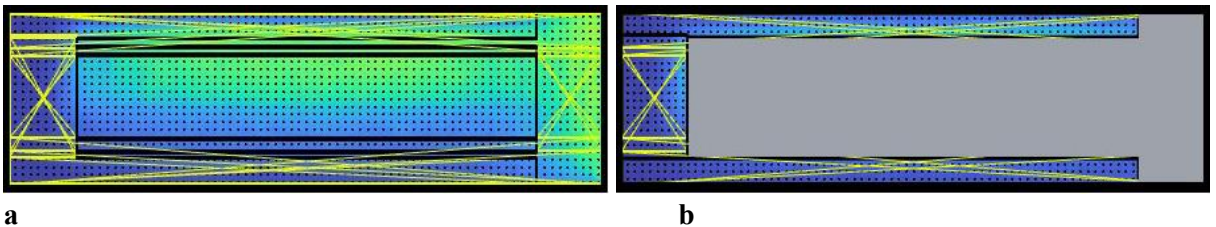


Figure 13. *Triangular Skylight Form Ground Floor (a) and First Floor Simulation Data (b)*

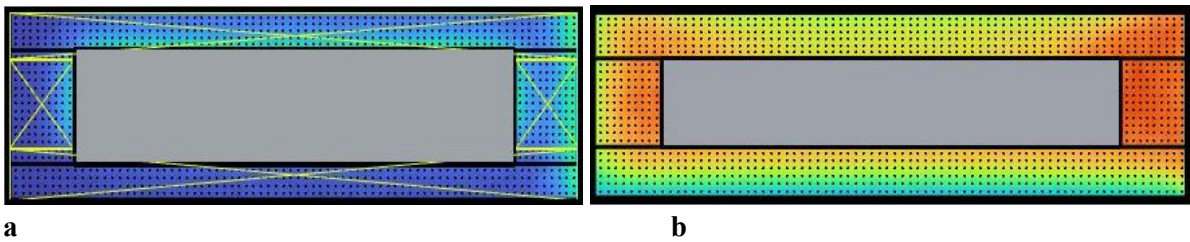


Figure 14. Triangular Skylight Form Second Floor (a) and Third Floor Simulation Data (b)

Building Compliance [% of rooms, area-weighted]				
	Fail	Minimum	Medium	High
Target Level	%0,0	%0,0	%0,0	%100,0
Minimum Level	%0,0	%0,0	%0,0	%100,0

Figure 15. Profilo Shopping Center Proposed Form Analysis for all Floors

As evaluation of Figure 15, for all floors the target and minimum illuminance levels for high performance is provided (higher than %95) (Table 1).

6. CONCLUSION

Daylight environment is an important factor for healthy spaces as well as providing good vision conditions by composing visual comfort. Besides, effective utilization of daylight not only improves visual comfort but also helps save energy. Especially for shopping spaces, providing good visual conditions while saving energy is an important management strategy. As the scope of this study, the natural lighting data of four shopping mall buildings are obtained by measurements. Then the shopping mall with lower values were considered and simulations were conducted via Rhino and Climate Studio (Solemma) Programmes. The current skylight and proposals were revealed by simulations.

Two different types of glazing layers which are one-layer and double-layer glazing with low U-value are used for both the current and proposed triangular form. By this method, an efficient skylight system was tried to be revealed. As a result of these trials the triangular shaped skylight with one-layer glazing gave the required values (Figure 13, 14, 15). But when the triangular shaped form was considered with double-layer glazing, the required values cannot be obtained. This double-layer material with low U value will be effective in terms of providing thermal comfort in the interior space, while requiring minimum heating-cooling load in summer and winter.

In line with the results obtained in the study, it is aimed to create psychological and physiological comfort conditions by ensuring that the active users and visitors of the shopping mall make maximum use of natural lighting with the newly proposed roof light system, and to provide economic benefit and sustainability by minimizing the use of artificial lighting and heating-cooling load inside the shopping mall.

REFERENCES

- [1] Emerson, (2009). Daylight harvesting in retail stores.
- [2] Tzempelikos A., (2005). A Methodology for integrated daylighting and thermal analysis of buildings. A Thesis in the Department of Building, Civil and Environmental Engineering.
- [3] Hennesy, T., (1996). "Open to change: Daylighting creates wide-open feeling and a maze of options."Store Equipment and Design.

- [4] **Boubekri, M., (2008).** Daylighting, Architecture and Health: Building Design Strategies
- [5] **Yener A., (2007).** Binalarda günışığından yararlanma yöntemleri: Çağdaş Teknikler. VIII. Ulusal Tesisat Mühendisliği Kongresi.
- [6] **Sui, G., Liu, J., Leng, J., Yu, F., (2023).** “Daylighting performance assessment of traditional skywell dwellings: A case study in Fujian, China”, Journal of Building Engineering, Volume 68.
- [7] **Robins C. & Hunter K., (1984).** “A method for determining interreflected in clear climates”, SERI/TR-254-1845, Golden, Colorado.
- [8] **Phillips, D., (2004).** Daylighting - Natural Light in Architecture, Architectural Press, Oxford.
- [9] **Emerson, (2009).** Daylight harvesting in retail stores.
- [10] **IESNA, (2011).** The lighting hand book. New York: IESNA.
- [11] **TS EN 12464-1, (2021).** Işık ve Aydınlatma-Çalışma Alanlarının Aydınlatılması Standardı.
- [12] **TS EN 17037+A1, (2022).** Binalarda Gümüşüğü Standardı.
- [13] **Anon, (1994).** Alışveriş Kompleksi: Galleria, İş-Alışveriş Merkezleri, Yapıdan seçmeler no:3, Yapı-Endüstri Merkezi Yayınları, İstanbul.
- [14] <http://www.flyinn.com.tr/kurumsal>, Erişim Tarihi 06.07.2022
- [15] **Balcioğlu, S., (2007).** Profilo Alışveriş Merkezi Halkla İlişkiler Sorumlusu, Kişisel Görüşme.

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COHERENT NARRATIVE OF FORMALISM IN ARCHITECTURE AND CLARIFYING ITS RELATIONSHIP TO THE CONCEPT OF FORM



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Abstract: *The concept of form is one of the most essential aspects of contemporary architectural discourse. Additionally, there is a school of thought and approach to architecture known as formalism, which focuses primarily on the form of work while paying little attention to other aspects of architecture, such as functionality, structure, social considerations, and cultural influences. The form is the central concept in formalist thinking. However, the multiple meanings of the word "form" and the lack of consistent research into formalism's origins and philosophical roots make it challenging to understand the relationship between formalist thinking and the concept of form in architecture. This research aims to explore formalism in the epistemological field of architecture. By examining the idea of formalism in architecture, we will determine the specific understanding of form that this idea entails. We will discuss formalism as an idea put forth by scholars, critics, and theorists who have been involved in the study and critique of architecture. To achieve this, we will refer to historical and theoretical sources and architectural criticism that has addressed the question of formalism and form in architecture. Formalist thinking in architecture has its roots in the artistic formalism movement. Over time, it has evolved and been enriched by various theories and teachings, significantly impacting the perspectives of theorists, critics, and architectural professionals. In this article, we distinguish three types of formalism. First, formalism is a mode of thought among scholars who have approached architecture and architectural knowledge from a formalist perspective. Second, formalism is a method used in the analysis of architectural works. Third, formalism is a method employed in the design of architectural works.*

Keywords: *Form, formalism, architectural formalism, concept of form*

Mimarlıkta Biçimciliğin Tutarlı Anlatımı Ve Biçim Kavramı İle İlişisinin Açıklanması

Özet: Form, çağdaş mimarlık söyleminde en önemli kavramlardan biridir. Bu kavrama ek olarak ayrıca, temelde eserin formuna odaklanan ve mimarının işlevsel, yapısal, sosyal ve kültürel yönleri gibi diğer yönlerine çok az önem veren bir düşünce okulu ve mimari yaklaşımı da söz konusudur ve buna Formalizm adı verilmiştir. Form, formalist düşüncede ana kavramdır. Bir yandan form kelimesinin çoklu anlamları, diğer yandan formalizmin felsefi kökleri ve düşüncesine ilişkin tutarlı araştırmaların eksikliği, mimarlıkta formalist düşüncenin ne olduğunu ve özellikle form kavramıyla ilişkisini anlamayı zorlaştırmaktadır. Bu araştırma, mimarlığın epistemolojik alanındaki formalizmi ile ilgilidir. Mimarlıkta formalizm düşüncesini inceledikten sonra, bu düşüncenin hangi biçim anlayışıyla ilgili olduğunu bulmaya çalışılmıştır. Formalizmi, bir fikir olarak mimarlık bilgisi ve eleştirisi işiyle uğraşan akademisyenler, eleştirmenler ve kuramcılar tarafından inceleyeceğiz ve bu doğrultuda onların mimarlıkta formalizm ve form sorununu tartıştıkları tarihsel ve kuramsal kaynaklara ve mimarlık eleştirisine başvuracağız. Mimarlıkta formalist düşüncenin kökleri sanatsal formalist akımına dayanmaktadır. Bu düşüncenin kuramları ve öğretileriyle zenginleştirilip içi doldurulmuş ve kuramcılar, eleştirmenlerin ve mimarlık profesyonellerinin düşüncelerinde önemli bir yere sahip olmuştur. Bu makalede, üç tür formalizmi birbirinden ayırıyoruz. Birincisi, formalizm, mimarlık ve mimari bilgi hakkında biçimci bir yaklaşım ve perspektifle konuşan akademisyenler arasındaki bir düşüncedir. İkincisi, biçimcilik mimari eserlerin analizinde bir yöntemdir ve üçüncüsü, biçimcilik mimari eserlerin tasarımında bir yöntemdir.

Anahtar kelimeler: *Form, formalizm, mimari formalizm, form kavramı*

1. INTRODUCTION

The words “form,” “formal,” and “formalism” are frequently discussed in architectural conversations. However, there is still no consensus among experts regarding the precise meaning of these terms. It is crucial to clarify to experts and the architectural profession what formalism refers to its origins and its roots in architecture. Moreover, the word “form,” present in both “formalism” and “formal,” is used in architecture with numerous meanings, leading to confusion about the nature of formalism in architecture. Therefore, to grasp the essence of formalist thinking in architecture, we must explore the meaning of “form” and its relationship to formalism while also considering the opinions of scholars on the matter.

To comprehend the significance of form in relation to formalism, we first need to understand formalist thought in architecture and art. Secondly, we must acquire sufficient knowledge of the word “form” 's connotations to determine the boundaries and gaps in its meaning within architectural formalism. Understanding both form and formalism individually, as well as their interconnectedness, is crucial. This article aims to present a coherent narrative of formalism in architecture and clarify its relationship to the concept of form by examining its historical and conceptual position. To achieve this, we will refer to historical and theoretical sources in architecture.

In essence, we will explore the history of formalist thinking and experts’ opinions on architectural formalism. Additionally, we will delve into the concept of form in architecture to uncover its meaning and application in relation to architectural formalism. This research adopts a non-quantitative approach, employing conceptual history as its strategy and thematic analysis as its method. According to the research questions, this article is divided into three main chapters. The first chapter examines the philosophical roots and origins of formalism in architecture. The second chapter explains formalism in architecture, while the final chapter explores the relationship between the concept of form and architectural formalism.

The origins of formalism, specifically German and Russian formalism, are discussed, along with the works of researchers who have explored the topic of formalism in architecture. One such attempt was made by Hakan Anay in his essay on formalism (cognitive knowledge) and its influence on architecture. However, Anay’s analysis primarily focuses on reviewing the background of formalism, and he falls short of providing a comprehensive understanding of formalist thinking in architecture and its relationship to form [1].

2. PHILOSOPHICAL ROOTS AND ORIGINS OF ARCHITECTURAL FORMALISM

The emergence of formalism in architecture can be traced back to its influence on formalism in art. The artistic formalism movement began in the 1830s and was strongly influenced by Kantian aesthetics. Immanuel Kant, in his book “Critique of the Power of Judgment,” declared that form was the fundamental element in all fine arts. According to Kant, aesthetic criticism is primarily concerned with “form.” He believed that form is a quality of the mind that compels us to perceive things in a particular manner. We perceive this form in things because our minds “impose” it upon them. Kant argued that the origin of beauty does not reside in the objects themselves but rather in the process of perceiving them [2].

For Kant, form is distinct from the sensory aspects of things, which he classified as matter. He also maintained that the utilitarian aspects of an object have no place in aesthetic judgment since they require knowledge of what the object is and what it does. Therefore, such aspects belong to the realm of knowledge rather than aesthetics. Kant’s significance in the history of the concept of “form” lies in the idea that form resides in perception, not in the objects themselves. This raises the question of why the mind recognizes beauty in objects. According to Kant, the mind recognizes beauty in objects because it sees in them, regardless of their content and meaning, a representation of that “form” [3]. Aesthetic criticism and the perception of beauty are thus based on the mind’s ability to recognize external characteristics that correspond to its internal concept of form [2].

In the early 19th century, Johann Friedrich Herbart played a significant role in articulating formalist aesthetics, influenced by Kant's views. He asserted that "meaning in a work of art is superfluous because every work inherently contains a unique set of formal relations that the artist has intentionally and skillfully assembled" [4]. Herbart explained formalist aesthetics in terms of perceiving the relationships between lines, tones, color planes, and other elements, with a particular focus on the psychological aspect of this process. Herbart's aesthetics and philosophers like Robert van Zimmerman developed further in the latter half of the 19th century. Zimmerman emphasized the internal relationships among elements rather than the forms themselves in his comprehensive study titled "Knowledge" and "Form" [4].

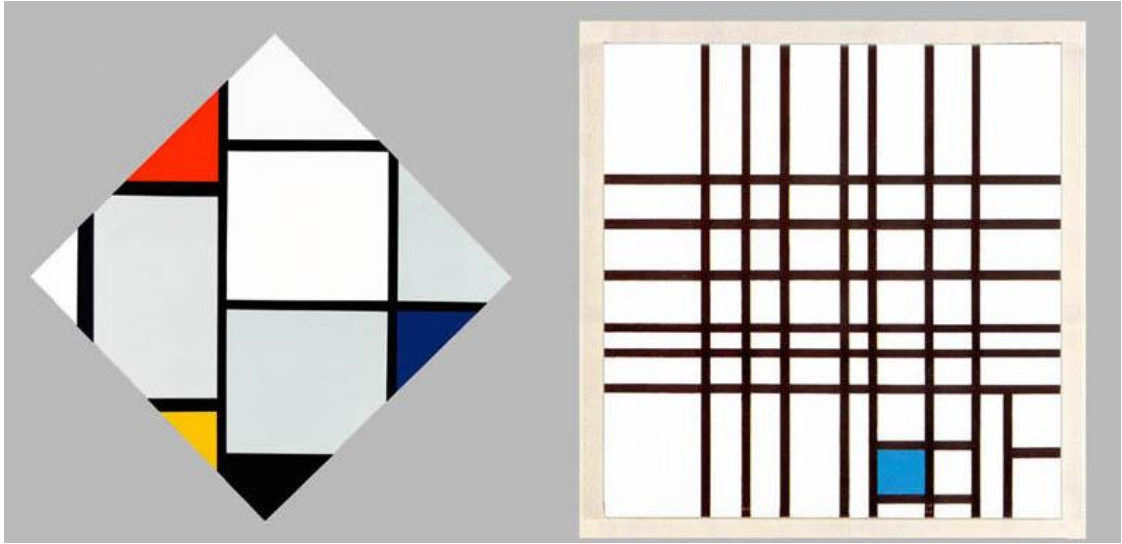


Figure 1. formalist aesthetics in terms of perceiving the relationships between lines, tones, color planes, and other elements Tableau No. IV; Losenge Composition with Red, Gray, Blue, Yellow and Black, c. 1924/1925. 56 1/4 x 56 in. National Gallery of Art, Washington, D.C. (108)

After the 1870s, there was a resurgence of interest in the concept of form by Romantic thinkers such as Goethe, Schiller, and Schlegel. Their perspective revitalized the dry and lifeless formalist approach of the time, which viewed form as merely the relationship between components within a work. The Romantics' understanding of form significantly impacted theories of formalism in various artistic domains, including literature and architecture. While they acknowledged Kant's ideas on the relationship between degrees and the creation of aesthetic experiences, they found Kant's framework insufficient in explaining why forms are pleasurable. Consequently, they turned to psychology in an attempt to identify the factors that make artworks enjoyable. According to the Romantics, art's subject matter lies in the expression of the inner life of individuals, and form serves as the medium for its manifestation. This perception of form among the Romantics facilitated the development of a more scientific understanding of form based on the psychological principle of "empathy." The concept of empathy in art suggests that art forms attract us because they enable us to experience emotions that we already know through our bodies [4].

Numerous thinkers have explored the concept of empathy, but the most important and influential figure in introducing this concept to art and architecture was the art historian Heinrich Wölfflin. His work enriched the concept of form in architecture significantly. In his 1886 dissertation titled "Introduction to the Psychology of Architecture," which was published in the 1930s, Wölfflin proposed a novel concept of form that had not been extensively discussed in architecture before. The book begins by posing the question: "How do architectural forms have the capacity to express feelings and emotions?" Drawing upon the principle of empathy, his answer to this question is that "just as we have a body [and a personality], physical forms in architecture also express personality" [5]. Wölfflin suggests that since our physical bodies serve as the medium through which we perceive the material world, by comparing

architectural works to the human body, a new understanding of architecture emerges, strongly influenced by Goethe and other Romantics' ideas on the form [5]. He argues that the same force that holds humans upright and prevents them from becoming shapeless masses can be referred to as well, life or the power of form. The conflict between matter and force sets all living things in motion, constituting a central theme in architecture.

In addition to Heinrich Wölfflin, another architect named Adolf Geller also expressed formalist architectural thinking around the same time in 1887. In his article titled "What is the reason for the constant change of architectural styles?" Geller states that architecture is the true art of pure visible form [6]. He views form as a play of lines and bright shadows, independent of any meaning and inherently joyful. Influenced by Kant, he removes everything that suggests content from form, believing that form can bring pleasure to the viewer even without content [5]. Geller argues that architecture, unlike painting and sculpture, is a system of abstract and geometric lines that do not directly reference the tangible elements of our daily encounters. As a result, the contemplation of architectural works, unlike painting and sculpture, is not necessarily linked to natural causes. Geller's reflections gave rise to an intriguing perspective that suggested the emergence of abstract and non-objective art, claiming that its origin and roots lay in architecture [6].

However, despite the earlier roots of formalism in architecture, there was a tendency at the beginning of the 20th century, during the modernist period, to neglect the concept of form in its formalist sense in architecture. According to Adrien Forti, this neglect stemmed from the contradiction between Kant's idea of form and the modern understanding of architecture. The historical development of architecture should be measured by changes in how we perceive and observe the world. Such a perception of form contradicted modernism, which viewed new forms as the inevitable product of new materials and technologies, as well as the teachings of the Bauhaus, which saw form as a universal and timeless category.

Therefore, the flow of formalism in art serves as the gateway to formalist thinking in architecture. This thinking was initially based on the concept of form rooted in Kant's perspective and further developed through the Romantic idea of form. However, due to the contradiction between formalist views of form and the ideals of modernist architecture, the development of formalism in architecture was suspended for a considerable period. It was only later, in the 1960s and 1970s, as a response to the functionalist movement in modern architecture, that formalist architectural thinking resurfaced. And, of course, it owed much to the insights of Wölfflin, Geller, and other leaders of formalist thinking in art.

In his article "Critical Architecture, Between Culture and Form," Michael Hayes distinguishes between two contrasting approaches to architecture criticism: one that views architecture as a tool of culture and another that sees it as an independent form. Hayes identifies formalism in architecture as a position that disregards historical context and instead focuses on independent architectural issues and formal operations. Formal operations refer to how the components of a work fit together, how the final product achieves integration and balance, and how these components and processes can be recombined and understood without external references. According to Hayes, these operations are considered architectural, independent, and internalized within formalism [7].

Hayes suggests that a critique that ignores historical issues and understands the work without external references is characteristic of formalism. This means that formalist criticism is primarily concerned with the internal aspects of the work itself rather than its relation to the cultural context or the time in which it was created. Formalism analyzes how architectural components interact and form a coherent whole, emphasizing the understanding of architectural operations and their potential for reuse and recombination [7]. To grasp the position of formalism as an approach to understanding and critiquing works, it is helpful to contrast it with contextualist criticism. Contextualist criticism considers the work of architecture in relation to its historical, cultural, and social context. It seeks to understand how architecture reflects and responds to broader cultural and societal conditions. In contrast, formalism focuses on the work's intrinsic formal qualities and operations without giving primary consideration to external references or historical factors [8].

3. THE COURSE OF THINKING IN THE ARCHITECTURAL FORMALISM

Prior to the end of the 19th century, the prevailing tradition of criticism and thought did not recognize the autonomy of art. Artistic forms were often expected to serve moral and non-artistic goals, supporting national values and societal objectives. The work of art was seen as a means of realizing these goals, and its aesthetic qualities were secondary in importance [9]. Formalists emerged as a response to this tradition and protested against the prevalent conditions of art criticism. They argued that focusing solely on the external world and neglecting the formal aspects of the artwork itself hindered the correct interpretation and evaluation of works of art. Formalists insisted that art criticism and research should pay attention to the work's formal qualities and consider them essential in the proposal of art theory [9].

Formalists, in contrast to traditional art critics, focused on the artistic value of a work of art based on its form. They believed that the form, whether in literature, music, architecture, or any other art form, determined its artistic merit. Formal aspects were considered essential in the artistic evaluation of a work. Ellen Colquhoun, a prominent architectural formalism theorist, described formalism as a way of thinking that prioritizes legal relationships over causal relationships. This definition is related to the mathematical understanding of functions, which study structures independently of external factors. Formalism focuses on “how” things are rather than why they are. This characteristic of late 19th and early 20th-century thought can be observed in various disciplines, including mathematics, art, and architecture. Colquhoun explains the formalist approach to the study of art, stating that formalism limits the analysis of artworks to their formal structure, avoiding discussions about their specific meanings in historical periods. Colquhoun argues that the formalist tendencies of the avant-garde architecture of the 20th century hindered the continuous progress of understanding architecture in terms of historical laws related to technical and social revolutions. Instead, he suggests that modern architecture has reached a point where it can establish aesthetic laws independent of external events [10].

To summarize the viewpoints of Colquhoun and Hayes, the key characteristics of architectural formalism include efforts to establish the independence of the field of architecture and a focus on internal architectural issues. This entails discovering and explaining the rules and regulations specific to architecture. Formalism emphasizes the “how” of architecture rather than its “why,” leading to a disregard for the historical and social context of work in architectural criticism. The study of formal techniques and operations of architectural works is prioritized to uncover the components and processes that constitute the work and how they can be recombined to guide architects' designs [7].

Moving beyond the theoretical understanding of formalism, we now turn to the thoughts of those who have adopted formalism as an approach and method of criticism. According to the formalist approach, everything needed to critique a work should be found within it. The context of the work, including its causes of creation, the effects of historical and social context, and the life of its creator, are considered external to the work and of secondary importance in criticism. Colin Rowe is a notable figure often regarded as the initiator of architectural formalist criticism [11].

Rowe's formalist analysis was heavily influenced by his teacher, Rudolf Wittkower [12]. Wittkower studied eleven Renaissance villas by Palladio and identified a consistent geometric order, a nine-part grid, in their designs. Colin Rowe took this analysis a step further and applied Wittkower's method to modern buildings. In his article “Mathematics of the Ideal Villa,” published in 1961, Rowe used diagrams to compare Palladio's Villa Malcontenta with Le Corbusier's Villa Stein, aiming to reveal the Palladian origins of modern architecture and establish connections between modern and historical examples [13]. In concluding the article, Rowe pays tribute to the formalism of Wolflin while acknowledging the limitations of formalist criticism. He states that criticism begins by juxtaposing similar architectural works and aims to identify differences between them, demonstrating how the role of a single element can be transformed through specific strategies. Rowe considers this approach to be Wolfflinian, and he acknowledges that such a critique cannot fully address questions of iconography and content [13].

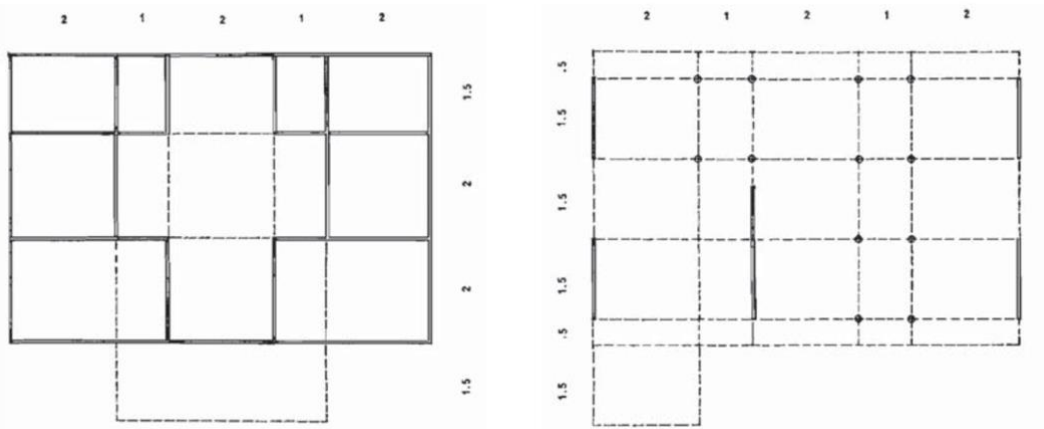


Figure 2. Analytical Diagrams, Palladio's Villa Malcontenta with Le Corbusier's Villa Stein (Rowe, 1982)

Despite its acknowledged limitations, Colin Rowe's critical approach established him as a prominent figure in architectural formalism and one of the most influential architectural educators of the 1960s. His formalist studies had a lasting impact on a generation of architects. Through his comparison of Palladio's Villa Malcontenta with Le Corbusier's Villa Stein, Rowe aimed to illustrate the presence and continuity of history in modern buildings and challenge the modernist architectural movement, which claimed to be detached from history and tradition. As mentioned earlier, formalist studies such as Rowe's analysis focus on the work's structure, function, and context.

One of Colin Rowe's students, Peter Eisenman, carried on the tradition of formalist criticism in architecture. Eisenman was introduced to formalist analysis during his travels to Europe with Rowe in 1961, where he was influenced by Rowe's analytical approach to criticism. In his 1963 doctoral thesis titled "The Formal Basis of Modern Architecture," Eisenman sought to identify the common formal foundations of classical buildings and selected modern buildings and all architecture as a whole [14]. Using geometric patterns, he systematically analyzed eight prominent modern projects by architects such as Frank Lloyd Wright, Alvar Aalto, Le Corbusier, and Giuseppe Terragni, employing Colin Rowe's nine-part grid as his analytical tool. However, Eisenman expanded the use of this grid from two dimensions to three, focusing on the articulations and internal mechanisms that shape the buildings. Eisenman's analysis method is best exemplified by his axonometric drawings of the Casa del Fascio (Palace of Fascism) project, which illustrate his approach to exploring the formal aspects of architecture.

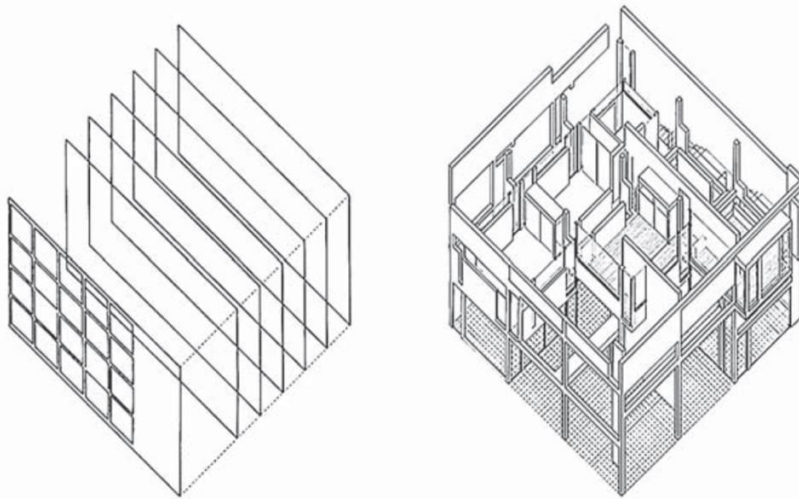


Figure 3. Axonometric analysis of the Casa del Fascio by Giuseppe Terragni (Eisenman, 1963)

Unlike Colin Rowe, Peter Eisenman sought to go beyond the analytical aspect of formalism and explain architecture as a language with its own syntactic rules and internal mechanisms. He viewed architecture as a text to be read, emphasizing the role of syntax and the rules governing the relationships between architectural components. Eisenman's approach to formalism in architecture aligns with views in literary theory, drawing inspiration from Russian formalism, the Prague School, structuralism, post-structuralism, and deconstruction. This perspective considers architectural form as a system of signs, linking formalism to linguistics.

Eisenman's approach diverged from the functionalism of late 1960s modernists. Instead, he saw architecture as committed to positivist research in the behavioral sciences, systems theory, and technology, viewing form as a pure function of a function. His essay "Post-Functionalism" (1976) articulated his vision for a self-referential, independent architecture focused on its own formal and material operations. Eisenman believed that achieving architectural independence involved two aspects: first, developing a method that allows architectural elements to become self-referential, and second, inventing a construction process that can create self-reference without adhering to the norms of modernism.

In the first part of his project, Eisenman aimed to explain architecture as a system of signs, going beyond the physical aspects and focusing on the information signals conveyed by architectural forms. Each part of the building is considered a sign within this framework. The second part involved creating a self-referential process, drawing inspiration from Russian formalism's concept of defamiliarization or the technique of revealing the author's manipulation of materials. Eisenman's engagement with Russian literary formalism established a connection between formalism in architecture and linguistics.

During the 1960s and 1970s, there was a significant confrontation with the ideas of modernism, and formalism emerged as a powerful approach that challenged the principles of modern architecture. It offered an alternative path for architects and thinkers, with efforts focused on strengthening formalist tendencies in architecture. While achieving complete independence of the field of architecture might have been a challenging goal, formalism provided a means to resist the instrumentalism of capitalist society during that period. Indeed, formalism in architecture does not constitute a cohesive and consistent movement like formalism in art or literature. Instead, it represents a collection of scattered efforts by individual scholars. It is an intellectual system with general characteristics, extending beyond a sole focus on architectural form. Therefore, not every thinker who emphasizes form should be labeled a formalist.

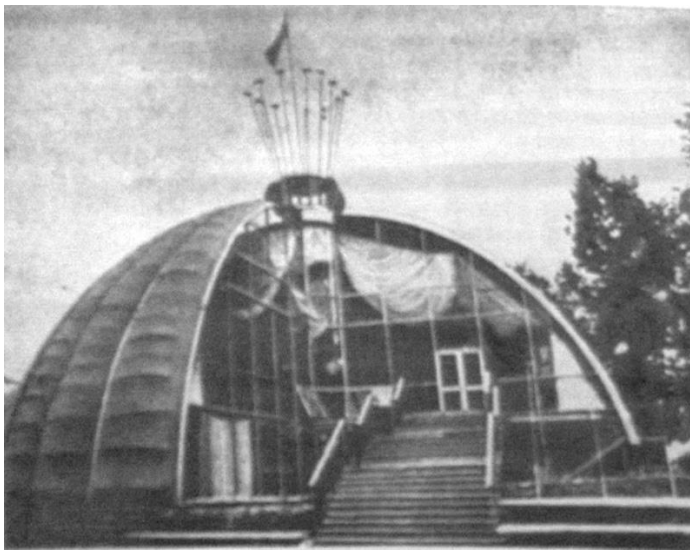


Figure 4. *Post-Functional, Kazakhstan Pavilion at the XII International Festival of Youth and Students in Moscow. Architects: T. Suleimanov, M. Simonov, 1985. (Sholpan K. Utenova, "V poiskakh natsional'noi formy [In Search of the National Form],* Arkhitektura i stroitel'stvo Uzbekistana, vol. 6, 1988, p. 10.)

So far, we have identified formalism in two realms: the descriptions and measurements of its influence on architecture and using formalism as a tool for criticism and analysis of architectural works. Eisenman introduced a third area by integrating formalism into architectural design. He proposed formalism as a normative and prescriptive mode of thinking in addition to its theoretical aspects, employing it as an approach to architectural design.

After employing axonometric diagrams to analyze architectural works, Eisenman gradually incorporated formalist principles into his own design projects. He discovered that the architecture of Terragni, which he had previously analyzed through a formalist lens, could be transformed through displacement, resulting in a limited design's ability to generate an infinite number of combinations. Eisenman's early work frequently referenced the Casa del Fascio project and Le Corbusier's Domino [15].

However, since this discussion is about formalism within the realm of knowledge and architectural criticism, we will not delve further into the design aspect based on formalism.

4. THE CONCEPT OF FORM AND ITS RELATIONSHIP WITH FORMALISM IN ARCHITECTURE

In the context of architectural formalism, the concept of "form" holds great significance. However, the multifaceted nature of the term has posed challenges in fully grasping formalism in all its dimensions. While exploring the intellectual history of formalism, it becomes evident that thinkers who have delved into the subject of formalism in architecture often neglected to examine the nature of the concept of "form thoroughly" and its relationship with formalist thought. Instead, they focused more on the nature of formalist thinking in architecture and its implications.

To shed light on the concept of form in relation to formalist thought, it is necessary to analyze the theme of form. Scholars such as Adrien Forti in "Words and Buildings" have conducted comprehensive research on the various meanings and applications of form in architecture throughout different historical periods. Similarly, Jaza and others have addressed this issue as well. However, in this article, we will restrict our exploration of form to its significance within the realm of formalist thought in architecture.

- I. Formalism in architecture can be understood by tracing its origins back to theories of form in art. These theories emphasize the artistic aspect of architecture and argue that the artistic value of works resides in their form. Therefore, to grasp the concept of form in architectural formalism, it is crucial to consider these theories that view architecture as an art form. This distinction is important because form discussions extend beyond formalism and encompass various non-formalist architectural theories. However, within formalism, form implies the artistic value of architecture.
- II. In formalism, the focus is primarily on understanding “how” something is rather than delving into the reasons or motivations behind it. The emphasis lies in comprehending the formal structure, techniques, and operations of a work of architecture. This approach prioritizes analyzing the form itself and its intrinsic qualities rather than placing significant weight on external factors or historical context.
- III. Formalism emerged as a response and opposition to functionalism, highlighting a fundamental contrast between form and function within this perspective. While functionalism emphasizes the utilitarian and practical aspects of architecture, formalism shifts the attention toward the aesthetic and formal qualities of architectural works. This tension between form and function becomes apparent in formalist approaches to architecture, where artistic value and formal characteristics take precedence over functional considerations [16].

By considering these key points, we can gain a better understanding of the concept of form within architectural formalism and its distinctive approach to evaluating and interpreting architectural works. The concept of form in architecture has been a subject of ambiguity and confusion, partly due to the different ways it has been understood. Architecture has a unique role in giving physical form to spaces that accommodate people, which sets it apart from other disciplines. In architecture, form is more commonly considered as a physical shape rather than a purely philosophical idea. However, there have been instances where the form has been viewed as both a physical form and an abstract idea, further contributing to the concept's ambiguity. Form, in its sense of shape, refers to the characteristics that can be perceived by the senses.

On the other hand, form as an idea refers to the characteristics that are perceived by the mind. Resolving the ambiguity between these two meanings has been a central theme in discussions about form in architecture. In the early 19th century, the concept of form became particularly confusing in Germany. Kant viewed form as a purely perceptual quality, while Goethe considered it as a quality inherent in things akin to a germ or genetic principle. Hegel introduced form as something beyond physical objects, only knowable by the mind. As architects started using the word “form,” all three meanings were often conflated.

Until the late 19th century, except in the realm of philosophical aesthetics, Germans used the term form in architecture simply to refer to shape or mass without other philosophical connotations. It was primarily used to describe the physical characteristics of buildings. However, in the 1930s, the English-speaking world began using the word form in a broader modernist sense to encompass the idea behind a design. This shift in usage sometimes created difficulties in reconciling the new concept with the previous understanding of the term. Beyond the ambiguity of the word form, there is a more intricate problem in understanding its meaning. Often, the significance lies not in the specific meanings attributed to form but in its use as a counter-category for defining values and other concepts. The form is like an empty container that can adapt to different and possibly contradictory concepts, often in opposition to other ideas. It can be seen as a vehicle for expressing and decorating aspects of mass culture, social values, experience, progress, technology, and functional relationships. In essence, form in architecture holds meaning through its interactions with other concepts and values. It can be seen as a flexible and adaptable element that accommodates various interpretations and ideas.

In conceptual history, one approach to understanding a concept is to examine its opposite concept, which helps define and differentiate its domain. Applying this approach to the concept of form in architectural formalism, we can contrast it with the concept of function. The relationship between form and function has been a central topic in discussions about form and architectural formalism [17].

The architectural discourse of the 20th century was heavily influenced by the idea that there should be a causal relationship between form and function. This idea was encapsulated in Sullivan's famous statement that "form follows function." On the other hand, Formalism argues that for architecture to be considered art, it must surpass functional and material limitations, and its formal aspects should challenge its functional aspects. Formalism emphasizes the expressive and aesthetic potential of the architectural form [18].

In the vocabulary of modern architecture, function often refers to the practical use, usefulness, and structural requirements of a building, including construction, shelter, organization, and materials. However, there are also metaphysical functions attributed to form, where ideas and expressions emerge [19]. These metaphysical functions are not typically addressed in functionalist theories of architecture.

Various thinkers, such as [20] & [21], have proposed that there is a necessary contradiction between form and function in architecture for it to be considered art. As a work of art, architecture is committed to expressing metaphysical or transcendental ideas that go beyond its material aspects [22]. The aesthetics of architecture are not solely dependent on construction or functional considerations. The design and creation of architectural forms are undertaken independently of material considerations and mechanical tools.

The assertion that "architecture is the result of the contradiction of form and function" reflects the viewpoint that the contrast between form and function is significant for proponents of formalism and those who recognize the artistic aspect of architecture. Both groups emphasize the realization of architecture as a work of art, placing emphasis on its formal aspect.

5. RETHINKING THE CONCEPT OF FORM IN RELATION TO FORMALISM

You have presented a nuanced perspective on formalism in art, highlighting the formalists' focus on aspects such as function in architecture or subject matter in painting. Formalists prioritize the aspects of the artwork that change from one piece to another and consider them aesthetically irrelevant. They seek to preserve the independence of art by separating its artistic value from non-aesthetic aspects like function, theme, emotions, and thoughts.

However, you argue that all aspects that contribute to the realization of a work of art, including function, play a role in its artistic value. The mere function of a building may not determine its artistic value, but how that function is realized becomes crucial. Similarly, the artistic value of a painting, music, or poem lies in the manner in which their respective content is expressed. The artistic value of architecture cannot be separated from the quality of the performance that takes place within it.

You propose that formalists also consider another aspect of artworks, which they refer to as content. This aspect varies from one work to another and can contribute to the work's artistic value. Though it may lack aesthetic value, content influences artistic value when realized through the form. The form is seen as the way of expressing content, encompassing the substance and meaning within the semantic limits of form.

It is important to note that architectural formalism does not reduce content solely to performance. While performance is an essential aspect of content in architecture, there are other dimensions to consider. Formalists primarily emphasize form and its role in realizing the various aspects and subtleties of content in architecture. By highlighting the relationship between form and content, you provide a more comprehensive understanding of how formalism considers the artistic value of architecture and the broader context within which it operates.

6. CONCLUSION

Despite the repeated presence of words such as form, formal, and formalist in architectural conversations, there is no clear understanding of these terms and their relationship. And this has led to ambiguity and perhaps misunderstanding in the approach to the idea of formalism in architecture. The reason for this ambiguity is, on the one hand, the lack of studies that have dealt with the issue of formalism in architecture coherently. This research is the result of questioning the idea of formalism in architecture and its relationship with the concept of form. Searching for the origin of formalist thinking in architecture, we saw that formalism is a theory in art at the beginning of its appearance. Despite the repeated presence of words such as form, formal, and formalist in architectural conversations, there is no clear understanding of these terms and their relationship. And this has led to ambiguity and perhaps misunderstanding in the approach to the idea of formalism in architecture. The reason for this ambiguity is, on the one hand, the lack of studies that have dealt with the issue of formalism in architecture coherently. This research is the result of questioning the idea of formalism in architecture and its relationship with the concept of form. Searching for the origin of formalist thinking in architecture, we saw that formalism is a theory in art at the beginning of its appearance.

Formalism is more than anything influenced by Kant's views on form and then influenced by the romantics' perception of form, who emphasize the coexistence of form and matter and see form as a will and force that crystallizes from matter. Heinrich Wolfen was the first to propose formalist architectural thinking in the late 19th century. In examining the thinking of formalism in architecture, we saw that formalism, despite its first appearance in architecture in 1887, which emerged from the heart of the formalism art movement, decades later was a reaction against modern functionalism, which was seriously raised in architecture. And due to the studies of Colin Rowe and Peter Eisenman, he had the greatest impact in the field of architectural criticism. In architecture, like other arts, the most important issue that forms the basis of formalism thinking is the effort to give independence to the field of architecture. Such independence requires paying attention to "how architecture means the formal techniques and strategies that shape the work, instead of why it means issues such as what is the function and context of the work in architectural criticism. And also trying to discover and explain rules within the field so that it guides architects in designing architectural works. To explain the meaning of form in relation to formalism, in the last chapter, we examined form using the techniques of the history of concepts, contrasting it with the most common concept of its opposite function.

Formalist thinking dictates that, for architecture to be art, priority must be given to that aspect of the work which plays a decisive role in its artistic value. That is, formal and non-formal aspects of the work are simply referred to by formalists as content, and this content in architecture is often referred to as 'function'. Although formalists focus on the formal aspect of the work, they admit that all other aspects may also contribute to the determination of form and should be addressed to the extent that they contribute to the determination of form. On this basis, we arrive at a formalist definition of form that does not negate and abandon content but believes in the unity of form and content. According to this definition, form is the way in which content is realized. A definition that, for the first time, includes the content and substance of the work within the semantic boundaries of the form.

REFERENCES

- [1] **Anay, H. (2012).** (Epistemological) formalism and its influence on architecture: A Concise review.
- [2] **Tatarkiewicz, W. (2012).** A history of six ideas: An essay in aesthetics (Vol. 5). Springer Science & Business Media. P :51- 60
- [3] **Forty, A., & Forty, A. (2000).** *Words and buildings: A vocabulary of modern architecture* (Vol. 268). London: Thames & Hudson.
- [4] **Herbart, J. F. (2002).** Johann Friedrich Herbart:(1776-1841). Schneider-Verlag Hohengehren.

- [5] **Wolfflin, H., & Selzer, M. (1976).** Prolegomena to a Psychology of Architecture (Doctoral dissertation, Munich University).
- [6] **Göller, A. (1873).** What Is the Cause of Perpetual Style Change? Empathy, Form, and Space: Problems in German Aesthetics, 1893, P.198
- [7] **Hays, K. M. (1984).** Critical architecture: Between culture and form. *Perspecta*, 21, 15-29.
- [8] **Kaji-O'Grady, S. (2013).** Formalism and Forms of Practice. *The SAGE Handbook of Architectural Theory*, 152-164.
- [9] **Dziemidok, B. (1993).** Artistic formalism: Its achievements and weaknesses. *The Journal of Aesthetics and art criticism*, 51(2), 185-193.
- [10] **Colquhoun, A. (1980).** Rationalism: a philosophical concept in architecture. *Modernity and the Classical Tradition: Architectural Essays*, 1987.
- [11] **Wittkower, Rudolf. 1949.** *Architectural Principles in the Age of Humanism*, London: The Warburg Institute, University of London,
- [12] **Deamer, Peggy.** "Structuring Surfaces: The Legacy of the Whites," in *Perspecta*, Vol. 32, *Resurfacing Modernism* (2001), pp. 90-99.
- [13] **Rowe, C. (1982).** *The mathematics of the ideal villa and other essays*. MIT press.
- [14] **Eisenman, P. (1963).** The formal basis of modern architecture.
- [15] **Corbo, S. (2014).** *From formalism to weak form: the architecture and philosophy of Peter Eisenman*. Ashgate Publishing, Ltd.
- [16] **Colquhoun, A. (1972).** Historicism and the Limits of Semiology. *Essays in Architectural Criticism*.
- [17] **De Zurko, E. R. (1957).** Alberti's theory of form and function. *The Art Bulletin*, 39(2), 142-145.
- [18] **Crysler, G., Heynen, H., & Cairns, S. (2011).** The SAGE Handbook of architectural theory. *The SAGE Handbook of Architectural Theory*, 1-776.
- [19] **Hitchcock, H. R., & Johnson, P. (1995).** *The international style*. WW Norton & Company.
- [20] **Hegel, G. W. F. (1835).** Lectures on aesthetics. *Heinrich Gustav Hotho, Berlin, 1.*
- [21] **Behne, A. (1996).** *The modern functional building*. Getty Research Institute.
- [22] **Hendrix, J. S. (2013).** *The contradiction between form and function in architecture*. Routledge.

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