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Potentiality of a residential area: Practical design at Brigittaplatz

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ABSTRACT

Brigittaplatz located in the 20th district of Vienna, which is a mixed culture residential community with various issues. This paper attempts to uncover the existing problems, weaknesses, potential opportunities of the site and explore a set of local interventions to accomplish site regeneration through architectural and landscape measures. Study utilizes two axes to improve and reconnect the public service, green corridor as well as the interactive relationship. All the proposed interventions are not merely public facility renewal but a new functional and social design, which is trying to reactivate the various relationships in the site that can enhance the quality of life and carry over the impact to larger scales. Authors seek a holistic approach to regenerate Brigittaplatz.

KEYWORDS

regeneration, scale jumping, sustainability, community

ORIGINAL RESEARCH PAPER



1. INTRODUCTION

Like the trend of urban population growth around the world, the population of Vienna will increase by 280,000 in the next 25 years [1]. The dramatically increased population will bring challenges regarding transportation, settlement development and economy. As a result, the smart city Wien framework strategy 2019–2050 has been proposed. The purpose of these measures is to improve the quality of life of all residents of Vienna while minimizing natural resource consumption [2].

The study site of Brigittaplatz is situated in the 20th district of Vienna, between two riverbanks. Recently, it received an opportunity to regeneration through a research competition and the theme of it is called good urban life. The aim of this competition is the implementation of a holistic vision, a system thinking approach upon an existing Viennese quarter by using regenerative sustainable design principles. As the requirement of this competition, each group needs to provide a forward-looking vision build upon a historical-social planning base think in a present context. In addition, committee requires using multidisciplinary design approaches which must integrate with the aspects of energy supply, economy, education, social inclusion and environmental quality enhancement. This means that this competition will present an opportunity for enhancing the good urban life in all its manifestations and participants request to concentrate on social-cultural aspects, governance considerations and potential implementation scenarios that may carry over the impact to larger scales. So as to make a tangible contribution to this research, people with backgrounds in landscape, architecture and social design have participated in this research.

In the 19th century, Brigittaplatz began to become a mixed area of commerce, factories and residences. In the middle of the 20th century, it was influenced by urban modernism and formed the current pattern. Nowadays, the site equips with a market, Church, some divided green space and building blocks (Fig. 1), in which the market is very rare in the city due to the

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others, have been demolished. 86.368 populations are living in this district; most of them belong to the middle class. Brigittaplatz plays a transitional role because there is a new masterplan for the area in its vicinity.

2. AIMS AND METHOD

Brigittaplatz is a residential community, which has complicated built environment. The purpose of this study attempts to explore a set of local interventions and considering how to use them to accomplish site regeneration from architectural and landscape perspective, then carrying the impact to the rest of Vienna. The scope of the study contains:

1. analyzing the current situations of the site from different aspects;
2. identifying the perspective of interventions based on the summary; e.g. weakness and potential opportunities;
3. providing the objectivities for the design process;
4. giving a design concept and some detailed architecture and landscape interventions which combine energy supply, economy, education, social inclusion and environment quality enhancement.

3. PROBLEM-ORIENTED STUDIES

3.1. Analyzing the situation of Brigittaplatz with the following methods

- Study of accessibility. The existing vehicle roads, public transport, footpath and the connection with the rest of the city will be investigated. It provides evidence for later optimization design work;
- Green space and infrastructure study. It focuses on analyzing the status of existing green space (management, existing design, the status of usage) and the association with existing urban green infrastructure;
- Study of buildings. Existing functions and problems within the buildings can be studied; for example, whether

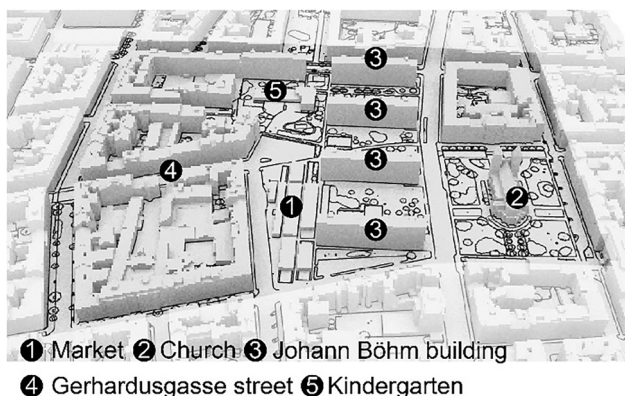


Fig. 1. Existing built environment analysis of Brigittaplatz
(Source: Author's plot)

the building needs to be modified, and whether the relationship between building and outdoor environment needs to be strengthened;

- User study. The user in Brigittaplatz contains residents, shopkeepers and shoppers. User study gives a relatively clear goal of what design is supposed to serve;
- Social investigation. It contains employment rate, cultural background, religion and educational level of residents;
- Urban Heat Island (UHI) study. Brigittaplatz located in the urban area and with many hard surfaces. Several buildings have enclosed form. It is already confirmed that urban heat island effect has a strong relationship with outdoor thermal comfort and urban energy use [3, 4]. Decreasing energy use is the requirement of the government of Vienna for each regeneration project;
- Open space and street study. This study involves the usage status, atmosphere, problems and the potentiality of transformation;
- Study of sustainability. The current state of sustainability in the site, e.g. solid waste collection, rainwater reutilization and making a judgment on which aspects can improve sustainability in the plot;
- Market facility study. It is a unique feature of Brigittaplatz. Study consists of analyzing the potentiality of building renovation, whether the function of entertainment, urban agriculture and commerce could combine.

3.2. What can be indicated through the studies above

- Brigittaplatz is a residential community with a mixed culture, diverse function of buildings. The height of buildings ranges from four to eight storeys and the majority of function is residential; except from one building block where located in the southwest of Brigittaplatz. This building block has many car repairs workshops and retails; e.g. bar, café and restaurant. However, the closest street (Gerhardusgasse Street) of it is car-focused and there is no tree can be found;
- Green space is well managed but lost the connection with the rest of green infrastructure in the city. Meanwhile, some green space has low design quality attracting few children. Generally speaking, the benefits of green space not only focus on the ecological aspect but also provide people with a social engagement space [5]. In addition, many researchers found that green space has a positive association with public health; like decreasing the risk of coronary heart diseases [6];
- Open space has limited area and occupied by private car, which means that there is no attract point to let residents going out from buildings or appealing visitors;
- There is more than 17% unemployment rate in this area. Only 13% population has a high educational level and more than 40% of the population was born in other countries [7];
- The market space has a long history and attracts a lot of people, but people prefer to stay for a very short time. Majority of shops concentrate on selling food and the

building height is around 4 m with a concrete structure. The large height difference with the surrounding buildings provides the possibility for the vertical transformation or renovation of the building;

- Brigittaplatz is not very impressive regarding sustainability but it can be improved by building renovation, green space improvement and using recycled materials in the later optimization design process.

3.3. Summary of identified problems and opportunities

- As a mixed culture residential community, open space plays an important role to enhance social communication and engagement between dwellers. The original function of open space should be recovered rather than still used as the parking lot. It is important to increase the proportion of open space since it not only provides a chance for leisure gathering but also effectively guide people to visit other functional space [8];
- Green space must reconnect with existing urban green infrastructure, in which some of them should be redesigned to satisfy the requirement of residents; e.g. children;
- In term of existing buildings, the enclosed building block should take some measures to mitigate the Urban Heat Island (UHI) effect (Fig. 2);
- Due to the low unemployment rate, it is necessary to provide some employment opportunities on the site. Besides, there needs a specific facility for cultural exchange;
- The market area is a unique feature of Brigittaplatz and has a long history. There are several opportunities in market space that may make a great contribution to site regeneration. But it is necessary to consider the following questions:
 1. How to attract people to stay in the market area for more time without changing the original function;
 2. How to integrate the function of recreation, commerce and society;
 3. How to apply sustainable interventions.

4. CONCEPT

Previous steps have proved that the site has complex social, environmental and economic issues. Thus, the enhancement

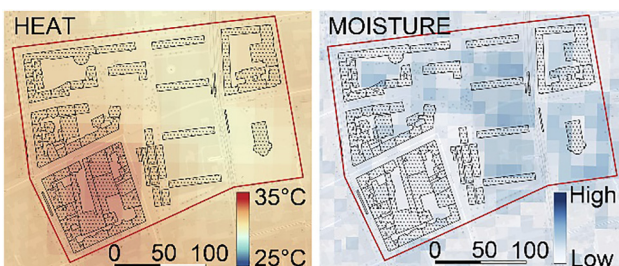


Fig. 2. The UHI effect of Brigittaplatz
(Source: Author's plot)

of these three aspects is the driver of exploring this set of local interventions. Study designated three objectives in the regenerative process, which are connection, interaction and share. These three aspects will complement and influence each other in the process of regeneration and be implemented by using architectural and landscape interventions. Besides, as a part of the urban area, it is necessary to consider the Brigittaplatz within a larger context and future plans of the city.

4.1. The idea of two axes

As mentioned before, there is a new masterplan in the area adjacent to Brigittaplatz. In this regard, study site could link with the new planning area to promote horizontal connections while expanding the scope of impact. Therefore, a horizontal axis connecting all significant parts can be created and two directions could be used for reorganizing Brigittaplatz. Gerhardusgasse Street and Hannovergasse Street cross through the site and facing east-west and north-south, respectively. They have potential to be employed as the axes. The horizontal direction is the vibrant public axis by using Gerhardusgasse Street that will connect the vivid urban life, functions and services for public use. Hannovergasse Street plays as the vertical axis which will enhance the green line created with various plants and atmospheres while reconnecting the existing green infrastructure (Fig. 3).

4.2. Architectural and landscape interventions in two axes

In terms of horizontal axis perspective, as a multicultural community, it is essential to provide residents with opportunities and places for acquaintance, communication and sharing knowledge. Social life in public spaces has a fundamental effect on the quality of life for individuals and the entire society [9]. Actively participate in social life can reduce the loneliness and increase the sense of belongs; especially in multicultural space [10]. Therefore, the functions of horizontal axis involve connecting the public function and services as well as improving the interactive relationship between residents and public life. As it was mentioned before, study



Fig. 3. Green and public axis

found that Gerhardusgasse Street has potential to act as the horizontal axis because it passes through the middle of the site and links the Church area, green space, residential buildings and few leisure facilities (Fig. 4). Moreover, many social and public services have already been created along the west of the street; e.g. bars, café, restaurants, etc. However, the drawback is that it is car-oriented and no vegetation cover as well as low active atmosphere. Therefore, the idea is to improve and reinforce the living atmosphere of the axis by pedestrianization of this street; for instance, activating the ground level of building along the street to enhance the living atmosphere and parking-lot recover the original function of public open space. Adding some vegetation, water features and furniture along the street to enhance the natural feelings. Many other additional adjacent functions also need a consideration, which includes an inter-generational center that will construct near the kindergarten to link up different age groups and cultures. However, prohibiting vehicles and removing parking space along the street will increase congestion in the adjacent area, thus there will provide e-bikes on the street and using dynamic price for underground parking. By improvement of public services of Gerhardusgasse Street, the horizontal axis will connect residential blocks, green space, and educational facility and entertainment areas.

With regarding vertical axis, it is significantly important that the site be considered in the larger green context of the city due to biodiversity. There is already some green space in Brigittaplatz and the existing urban green infrastructure is also well connected on the north of the site. But it is broken in the south; especially from market area to Augarten Park. Meanwhile, the intensity of urban heat island effect is significantly serious in the southwest of the site. Therefore, the idea of the green axis is that creating tree corridor along Hannovergasse Street to restore the green connection with Augarten Park. As a result, the green corridor can reconnect along with the Jägerstrasse Station, Brigittaplatz and Augarten Park (Fig. 4). Besides, renovating the building blocks by changing the enclosed building forms; e.g. removing some non-functional wall to increase air convection and adding green roofs and green walls to further

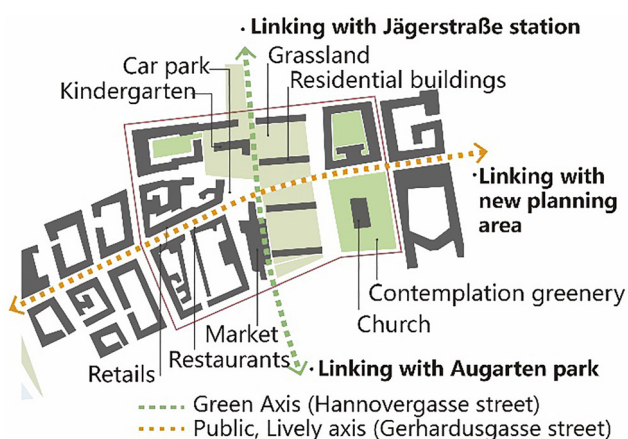


Fig. 4. Study site and two axes

decrease the UHI effect. Furthermore, previous analysis revealed that some green space has low design quality attracting few children [11]. To some extent, green space plays the same role as public open space; especially for children. It provides a chance for children to playing, learning and communicating with nature. Many researches showed that preschool friendship is benefits for developing social and emotional skills as well as improving a sense of belongs and relieving stresses [12]. Therefore, another purpose of the green axis is to improve interaction by enriching the interest and diversity of green space; for example, the parking space on the south of the site will be replaced by urban agriculture, some outdoor physical and educational facilities will appear on the green space. These measures will provide informal education opportunities to children; e.g. camping, woodcraft, planting; etc.

As a unique feature of Brigittaplatz, market provides commercial opportunities for communities and adjacent areas, but the conventional architectural style and single function of it rarely attract people from other parts of the city, especially tourists. The idea is that transforming the market area into a landmark, which will bring potential commercial chances to increase job opportunities. The vision of the new market is a friendly space that combining commerce, inviting atmosphere, green space, sustainability and social engagement. However, it is important to consider several things described in section 3.3.

4.2.1. The design concept of the new market. The original buildings of the market have a large height difference with surrounding buildings. Therefore, the redesign work was carried out in the vertical direction. Honeycomb is employed as the design form because designer wants the new market area to be a home, which attracts people visiting, appealing business settling down. Moreover, honeycomb has many irregular rhombic structures. These hollow celled arrays could have different functions, some of which can be used for ventilation or lighting at the ground level (Fig. 5).

4.2.2. Adding new green space and leisure space. Adding green space in the new market area can further strengthen the landscape character of the site while consolidating green connections with the rest of the city. The category of green space on the rooftop of the market is urban agriculture rather than grassland because it may bring commercial benefits to the site; for instance, the management of urban agriculture can provide job opportunities and the fruits of plants can be sold in the market. This forms a small cyclic system. The leisure spaces mainly concentrate on the north side of the new market, including the rooftop and ground floor that was previously used as the parking lot. The roof uses different heights in this area (Fig. 6), which trying to enhance the visual rhythm and divide the space into different size to meet the social needs of different ages. The water features are installed on the ground floor enriching the landscape experience and elements. These measures will provide a calm, comfortable and attractive environment for dwellers, tourists and workers.



Fig. 5. Concept design of the new market (from south to north perspective)



Fig. 6. Leisure space of the ground level

4.2.3. Improving the identifiability of Brigittaplatz. In order to enhance the integrity of the site, the rhombic structure is also used as the design form of furniture; e.g. bench, guidepost and art installation. The scattered furniture improves the recognition and orientation of the Brigittaplatz.

4.2.4. Realizing sustainability. The market rooftop is equipped with many solar panels, generating electricity for ground lighting. After serious calculations, there are 4,200 square meters available space on the rooftop of the new market, in which 1,200 square meters are used to install solar panels. The outcome is that energy production 140 milliwatt-hour (mWh) per year however the consumption is 48.6 mWh each year. Besides, the large areas of urban agriculture on the rooftop could absorb heat and slow down the UHI effect. Meanwhile, the rainwater will be collected and stored in a tank that used for irrigating the urban agriculture.

5. CONCLUSION

As a pilot research project of scale jumping, study treats the enhancement of social, environmental and economic aspects as the starting point of exploring the local acupuncture method. By adding and enhancing the public services along Gerhardusgasse Street, the horizontal axis connects the vivid urban life and provides an attractive street to let people going out from buildings. It improves the interactive relationship between public life and residents. In addition, the proposed tree corridor along the Hannovergasse Street

restores the green connection between Jägerstrasse Station site and Augarten Park. The green roof and green wall on the building blocks and market area not only mitigates the UHI effect but also further improving the landscape characters of the site. The green axis also provides some informal educational opportunities for residents in sharing knowledge by installing urban agriculture and outdoor educational facilities. As for the core area of Brigittaplatz, the original market was renovated into a landmark, which will bring potential commercial chance for increasing job opportunity. This landmark delivers a space for people from different background of culture to acquaintance, communicate and share their lives. In addition, the self-supply energy system transforms the market into a sustainable building. Those measures stimulate the Brigittaplatz to regeneration from social, environmental and economic aspects and the impact will extend beyond the boundaries of the site. Finally, this research project gives researchers with different backgrounds a comprehensive perspective to explore regional regeneration while provides some useful feedback and ideas for local government.

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