*Research Paper*

# From Green Continuity to Social Integration

## A Case Study on the Social Potential of Urban Greenery in Altstetten-Albisrieden Zurich

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### Abstract

*Urban greenery plays a significant role in urbanisation nowadays. Besides thermal comfort, urban greenery's contribution to personal well-being and social well-being has been addressed in a large body of research. This study focused on Zurich's urban greenery, specifically in the Altstetten-Albisrieden district, at two scales. At the macro scale, green spaces were categorised into three types, public green space, common green space and private green space, according to their ownership and accessibility. The connections among these three green space types were analysed in QGIS and indicated the significance of each public green space in the urban structure of the whole district. Based on this analysis of the spatial connections, four subsite cases were selected to further study their social potentials concerning green space structure and observed space use activities at the micro-scale. In the end, the study concluded that public green spaces should be planned considering location and size; green space structures could influence space use activities and provide different social benefits regarding community integration. Some key factors may include size, boundary and facilities provided in the green spaces.*

### Keywords

*Green spaces, social integration, Altstetten-Albisrieden, Zurich, case study*

## 1. Introduction

Urban greenery plays a significant role in urbanisation nowadays. It contributes to cooling cities (Park et al., 2017; Santamouris et al., 2018), providing comfort (Santamouris & Osmond, 2020) and other significant benefits in terms of cities' health (Maas, 2009; Vienneau et al., 2017), economy (Belcher & Chisholm, 2018; Dubová & Macháč, 2019; Panduro & Veie, 2013), and ecosystem (Oh et al., 2018). Today, given that the population in the urban area has been increasingly growing, urban greenery, consisting of the diversity of green spaces, such as city parks, neighbourhood gardens and green surfaces in buildings, has been considered with strategic importance in urban forms and structure. The non-physical benefits of urban greenery have been explored. A significant body of psychological research demonstrates the performance of urban greenery in reducing negative individual emotions (Dadvand & Nieuwenhuijsen, 2018; Gascon et al., 2018), such as sadness, fear and stress arousal (van den Berg et al., 2010).

Indeed, research and discussions are also extended to urban greenery's contribution to social well-being, including social cohesion and community integration. Prior studies suggested that urban greenery as public open green spaces with amenities can enhance social integration as green spaces can encourage outdoor activities, improve life satisfaction and increase dwellers' interaction (Dempsey et al., 2012; Jennings & Bamkole, 2019). However, high aesthetic value and well-equipped facilities do not guarantee space visits; design characteristics and green space settings must go hand-in-hand to achieve success and full potentials (Rasidi et al., 2012). Factors such as proximity to the house, accessibility, functions of spatial elements, sufficient size and person-to-person engagement play substantial roles (Russo & Cirella, 2018). Nevertheless, research probing the influence of these critical factors usually hired questionnaire surveys and interviews. The variations from perception to practice remind the need to investigate these factors in reality further.

Stemming from the ongoing research module Dense and Green Cities, this study investigated the potential of urban greenery to enhance social integration and the urban densification process. The study selected the Altstetten-Albisrieden district in Zurich as a case study. Altstetten-Albisrieden district is located in the west of Zurich City. It covers a 12.1 square kilometre area, extending from the Limmat River in the northeast to the Uetilibergs in the southwest. In light of the scenario that Zurich has been predicted to accommodate another 80-100 thousand people in the next decade, Altstetten-Albisrieden faces a critical challenge of severe population growth. This urban densification process requests comprehensive understanding and means to integrate people from different backgrounds and social groups into urban life.

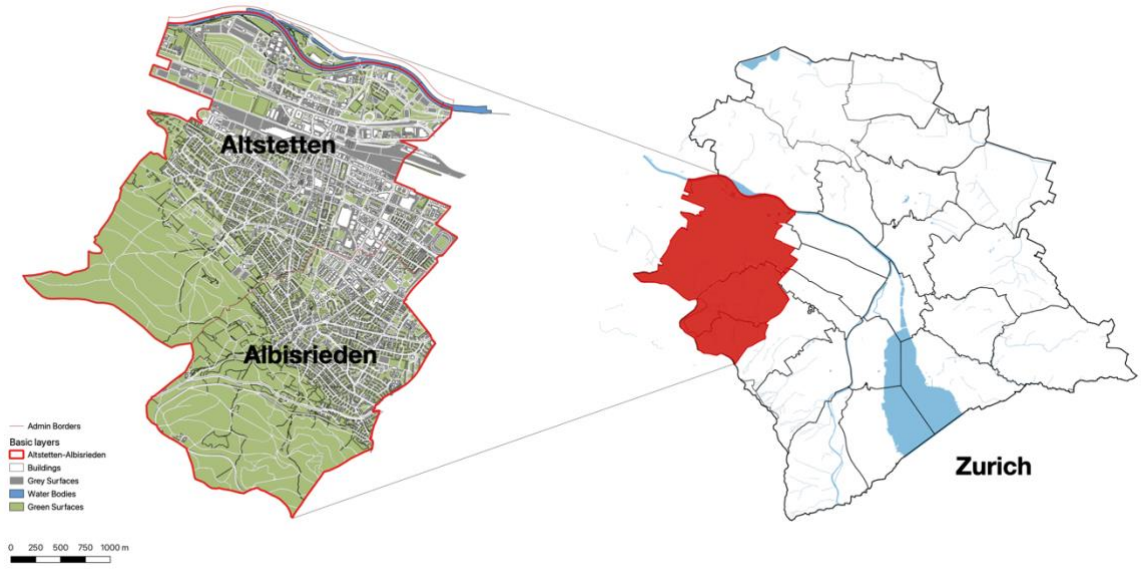



**Figure 1 Altstetten-Albisrieden case in Zurich**

The study consists of two parts. Urban greenery data of Altstetten-Albisrieden derived from the open-source data of Zurich and Open Street Map was first compiled in QGIS to demonstrate the urban greenery's distribution and network. Urban greenery was categorised according to its accessibility and ownership. Four subsite cases were selected for onsite observation of space use activities and demographic features. The results of the study have three folds. It displays the distribution and network of public green spaces in the Altstetten-Albisrieden district. The performance of four selected subsite cases as onsite space use activity observation is presented and discussed to stretch out the social potential of urban greenery on community formation and integration. Finally, some suggestions for planning and designing urban green spaces will be indicated.

## 2. Methods

### 2.1. Categorisation of green spaces

Data from the City of Zurich describes urban greenery based on the types of soil and surface, such as woods, meadows and swamps, and functions, such as agricultural fields, cemeteries and sports fields. As the study focuses on green spaces' use, accessibility and ownership were introduced as two primary parameters to re-classify green spaces in the Altstetten-Albisrieden district. Three types of green spaces were generated and adjusted via onsite observation.

- Public green spaces: city/district gardens and other public spaces. These spaces belong to the city, and people can always access them.
- Common green spaces: semi-public green spaces around residential buildings in neighbourhoods. These spaces belong to particular neighbourhoods and are shared by the neighbourhood's residents.
- Private green spaces: private gardens which belong to particular households and can only be accessed by the members of the households or via invitation/permits.

This study does not include other types of green spaces listed in the catalogues from the City of Zurich, which cannot support daily activities such as close forests and reserved farming fields.

### 2.2. Analysis of green spaces

Pre-observation field trips were conducted around the entire district. These trips provided some basic impression and experience on the space use in the district. Two facts emerged that most people approached public green spaces on foot, and people usually did not use common green spaces crossing neighbourhoods, although each common green space is equipped with similar playground facilities equipment and urban furniture, and are open publicly. These two facts shaped the analysis in two aspects.

- 800 meters (10-minute walk) and 400 meters (5-minute walk) were used as parameters to determine connection radius and the size of subsite cases [1].
- The hierarchic relations among three types of green spaces were described as public green spaces – public green spaces; public green spaces – common green spaces; and public green spaces – private green spaces. The connections between common green spaces and private green spaces were not considered in the space network analysis.

A global view of the green space network in the district was studied in QGIS. Information, such as street networks, spatial distribution and size, was extracted from the Open Street Map and the open-source urban data from the City of Zurich. Distance matrix and nearest neighbourhood tools in QGIS were employed to generate connections between three types of green spaces within 800 meters. The accumulation of connections towards public green spaces indicated the importance of each space in the whole district.

[1] 800-meter and 400-meter radius of service coverage respectively for city/district public open space and neighbourhood green spaces is defined in Categorisation of Public Open Space Based on Size and Coverage Area in SDG Indicator 11.7.1 Training Module: Public Space (UN-Habitat, 2018)

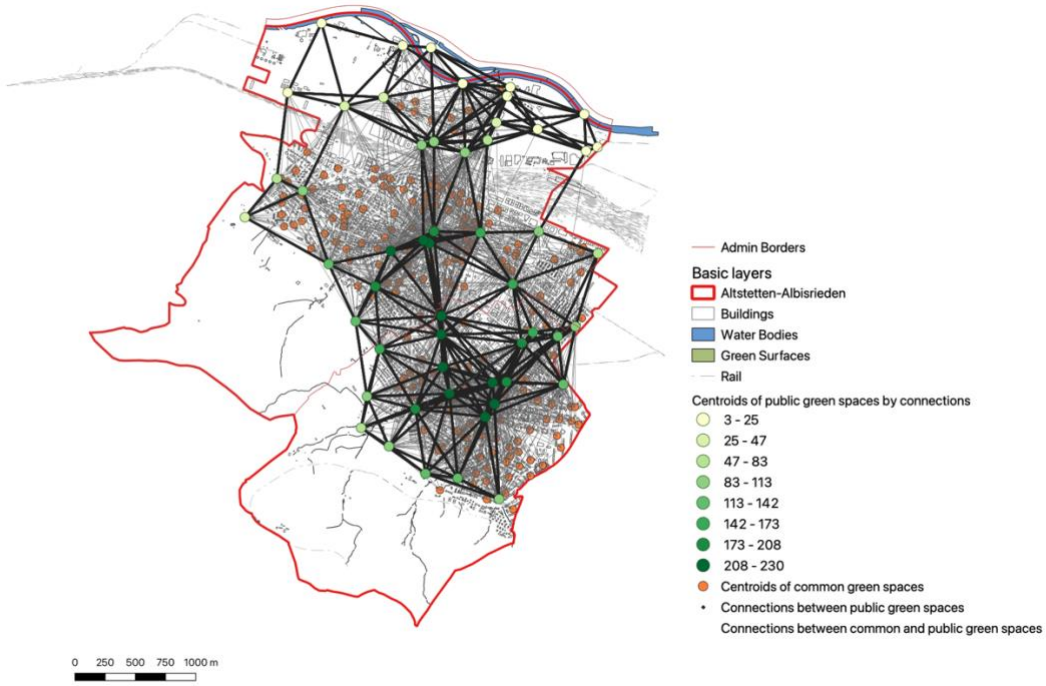



**Figure 2 Connections of public green spaces in Altstetten-Albisrieden district. The darkness of the centroids of the public green space represents the number of connections**

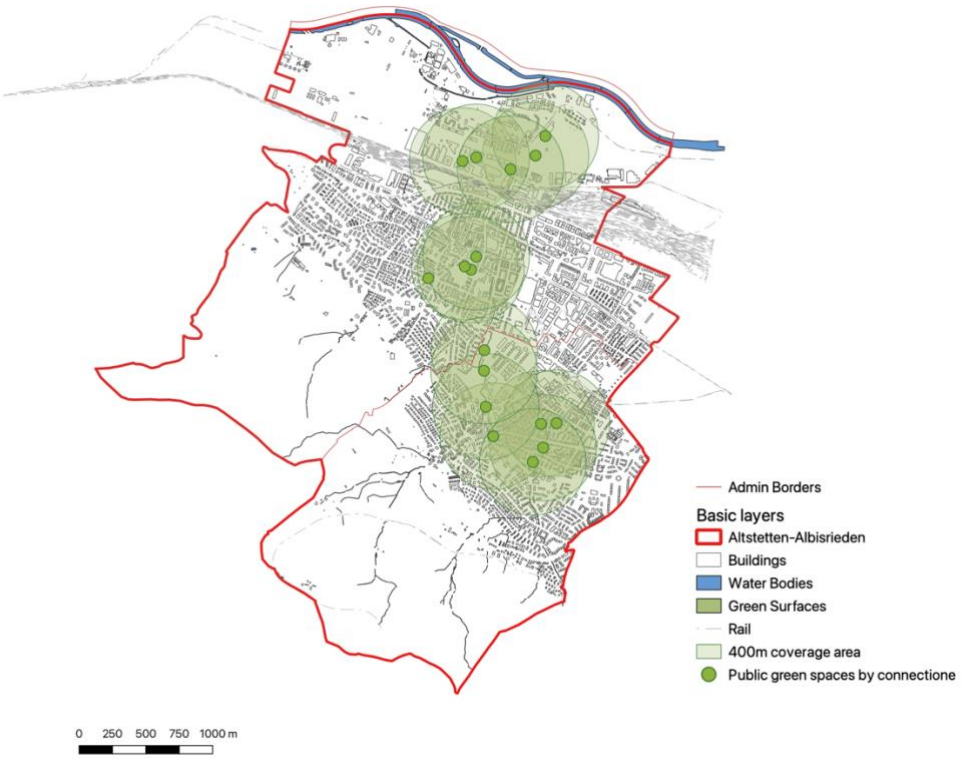



**Figure 3 Public green space corridor shaped by the coverage area of the public green spaces with most connections in the district**


**Figure 4 Four subsite cases based on the connections of public green spaces and 400-meter service coverage**

As shown in Figure 2, public green spaces in the whole district are separated into two major parts due to Motorway A1 and railways heading to Zurich railway station. Public green spaces in the district's middle have more connections than the others. Thus, four clusters with relevant high numbers of connections were selected. Each cluster has a comparatively large green space in the centre, named Grünau, Lindenplatz, Bachwiesen and Süsslerenanlage. Their 400-meter service areas and surrounding streets or physical boundaries formed four subsite cases (Figure 4). Further studies on these four subsite cases include the proportions between three types of green spaces, built areas and grey areas and their composition patterns in the cases.

## 2.3. Space use observation

People's activities and interactions in these four subsite cases were observed onsite. Space use activities were recorded via films, photos and as points in QGIS. Table 1 shows the activity information recorded during the observation. The observation covered most public green spaces, common green spaces and some grey spaces, such as playgrounds or public open spaces embraced inside public green spaces. The observation did not include private green spaces due to the lack of access. The onsite observation of each subsite case was conducted 14:00-18:30 on a typical weekday (e.g. Tuesday, Wednesday or Thursday) and on Sundays, on which the weather condition and temperatures were similar.

People's age and language information were used to further analyse space use behaviour in activity types and duration in the four subsite cases. Crossing-case comparison discussed whether people with different socio-cultural backgrounds and health conditions could share public green spaces equally and which green space structure enhanced this sharing best.

Table 1 Onsite observation contents

| Information of Space Use | |
|---|---|
| **Time** | The time people starting and ending their activities in the observed green spaces |
| **Location** | Places that people conducted their activities, this information was directly recorded in QGIS |
| **Age** | People on the site were categorised into five age groups due to the difficulty in estimating people's age:<br>• <10: Young children and toddles;<br>• 10 to 20: Teenagers with the ability of conducting independent activities;<br>• 20 to 30: Young adults;<br>• 30 to 70: Adults;<br>• >70: Senior people. |
| **Gender** | Two basic gender groups by observation: males and females. |
| **Language** | Main communication languages between space users were used to identify people's social backgrounds. The languages were marked as:<br>• Local language: Swiss German<br>• European languages: German, French, Italian, Spanish, English, etc.<br>• Asian languages: Indian, etc.<br>• Other languages: those we were not able to identify. |
| **Type of activities** | Based on the movement levels, eight types of activities were used to describe people's behaviours on the site. More specific information of onsite activities was also recorded in GIS dataset.<br>• Resting<br>• Chatting<br>• Gathering<br>• Playing<br>• Walking around<br>• Walking dogs<br>• Exercises<br>• Cycling |
| **Types of users** | Solo or group was used to group people on the site and understand how they interacted to others. |

## 3. Results

### 3.1. Green spaces

Table 2 below shows the provision of the three types of green spaces in the district.

The whole district offers rich green spaces in line with the urban plan concept of a "Garden City" since the 1930s (Kurz, 2021). Exclusive closed woods, forests and restored farming fields, nearly 20% of the land is covered by green spaces which can support daily activities with different access levels. Each resident can have more than 40 $m^2$ of green space on average. Regardless of the size of each space, public green spaces, including City/District gardens and pocket green spaces open to the public, are geographically distributed relatively evenly. The service areas of all public green spaces (400-meter radius) and those of

the primary city gardens (800-meter radius) cover the whole district. Residents in this district can easily reach some public green spaces within a ten-minute walk.

**Table 2 General information of green spaces in Altstetten-Albisrieden district**

| Type of green spaces | Area in Altstetten-Albisrieden district |
|---|---|
| Public green spaces | 609,244 $m^2$ (5%) |
| Common green spaces | 1,083,642 $m^2$ (9%) |
| Private green spaces | 644,706 $m^2$ (5.3%) |
| Total green spaces | 2,337,592 $m^2$ (19.4%) |
| Resident population | 57,077[2] |
| Average green spaces per person | 41.0 $m^2$ |

The size of public green spaces varies (Figure 5). Except for large spaces around sports fields at the district's periphery, most public green spaces have an area from around 100 $m^2$ to 30000 $m^2$. However, the sizes of public green spaces do not match their importance in the urban structure in terms of connections. In other words, the public green spaces with more connections to common green spaces and private buildings do not have relatively more extensive surfaces. Meanwhile, the organisational structures between each public green space and its surroundings vary. The selected four subsite cases indicate four different situations. Table 3 and Figure 6 below displays the space structure of these subsite cases.

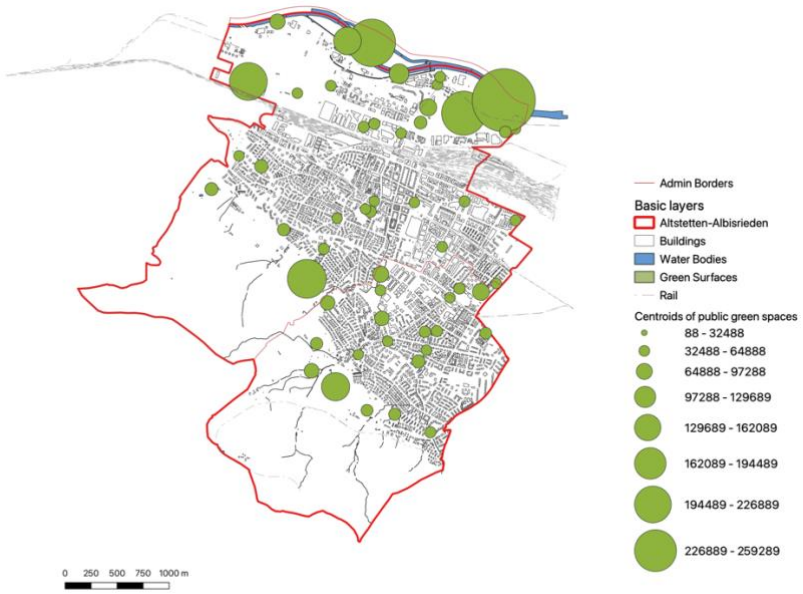
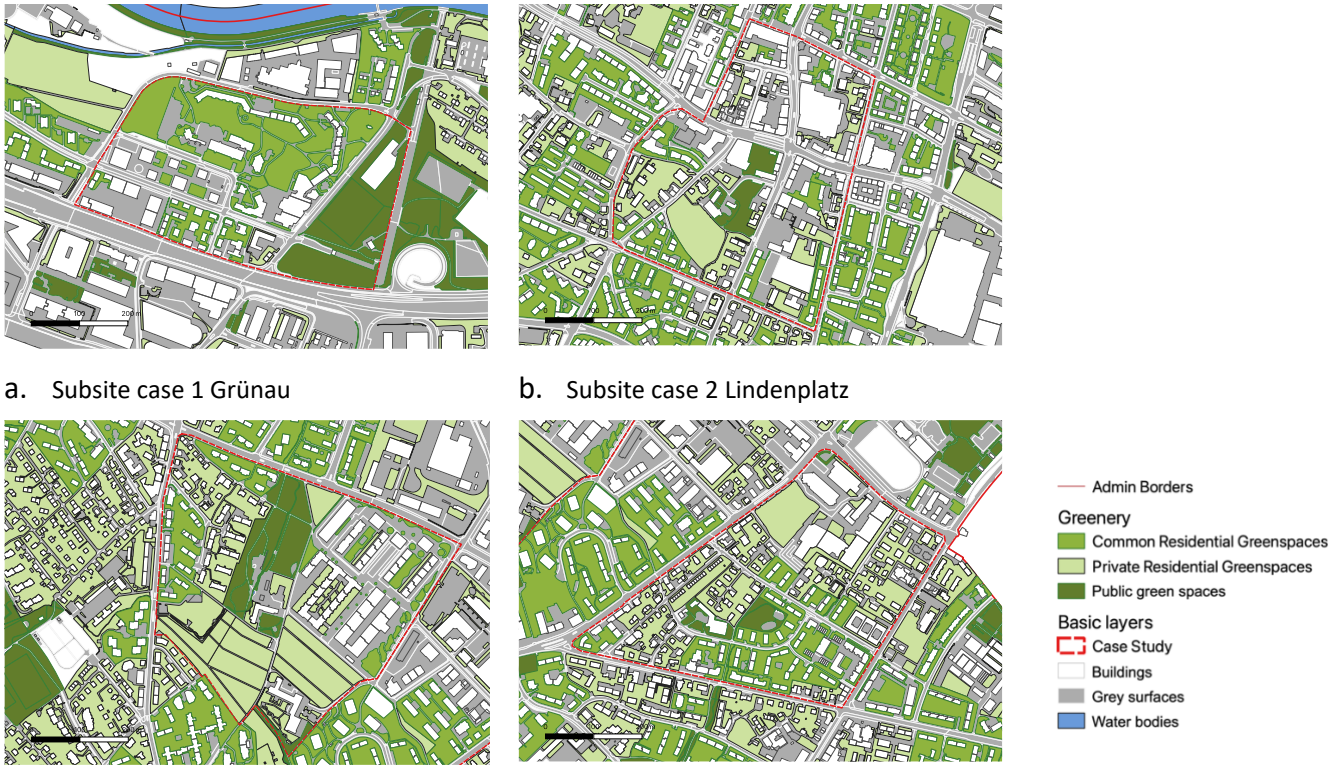



**Figure 5 Distribution of public green spaces in Altstetten-Albisrieden district. The size of the circles demonstration the areas of public green spaces.**

[2] The population information referred to the publications of City of Zurich: Quartierspiegel 091: Albisrieden 2022 and Quartierspiegel 092: Altstetten 2022.

Table 3 Structure of green spaces and other spaces in four subsite cases

| | Case 1 Grünau | Case 2 Lindenplatz | Case 3 Bachwiesen | Case 4 Süsslerenanlage |
|---|---|---|---|---|
| **Total Area ($m^2$)** | **191,326** | **199,225** | **228,623** | **199,032** |
| **Public green spaces ($m^2$)** | 23,039 | 5,410 | 22,747 | 5,472 |
| | 12.0% | 2.7% | 9.9% | 2.7% |
| **Common green spaces ($m^2$)** | 56,167 | 16,037 | 23,213 | 27,826 |
| | 29.4% | 8.0% | 10.2% | 14.0% |
| **Private green spaces ($m^2$)** | 1,116 | 46,623 | 76,412 | 66,202 |
| | 0.6% | 23.4% | 33.4% | 33.3% |
| **Grey area ($m^2$)** | 77,677 | 73,606 | 63,067 | 36,172 |
| | 40.6% | 36.9% | 27.6% | 18.2% |
| **Built Area ($m^2$)** | 33,327 | 57,549 | 43,184 | 63,360 |
| | 17.4% | 28.9% | 18.9% | 31.8% |




a. Subsite case 1 Grünau

b. Subsite case 2 Lindenplatz

c. Subsite case 3 Bachwiesen

d. Subsite case 4 Süsslerenanlage

Figure 6 Structure of green spaces in four subsite cases

Subsite case one is located between Limmat River and A1H Motorway. In this case, the common green spaces of a social cooperative housing project named Grünau contribute the most to the green and open spaces for daily use. There are some public green spaces around a football court with limited management. These public spaces perform mainly as a buffer between the residential areas and urban expressways (Europabrück and A1H Motorway). Very few private green spaces are in this case.

Subsite case two is the area around Lindenplatz, the most important cultural and commercial landmark of Altstetten since the 1910s. The centre of the case consists of a public square and two patches of public green spaces belonging to the old church of Altstetten. Around Lindenplatz are mainly private properties with private gardens and a sizeable private field for flower-picking. These private green spaces contribute to two-thirds of the total greenery in the case. Common green spaces appear in the format of introverted courtyards at the periphery of the case. Different from the other subsite cases, some shopping centres, cafe shops and restaurants are located around the public open and green spaces in this case. The Platz itself also hosts free markets every Wednesday and Saturday morning.

Subsite case three has one of the largest public green spaces named Bachwiesenpark in the centre, which includes open green space, Bachwiesen Playground and a garden of Albisrieden Community centre. Bachwiesenpark is located adjacent to one of Zurich's most significant residential projects in the last decade, named Freilager. One-third of the ground surface in the case is covered by private green spaces in the forms of private urban farming areas, gardens of caring centres and private gardens attached to the apartments on the ground floor.

The fourth subsite case is located in the centre of Albisrieden. Most buildings, in this case, are multi-family houses with no more than five floors and detached houses with private gardens. The public green space in the centre is relatively small compared to the other subsite cases. It is divided into two parts by the New Church of Albisrieden. Common green spaces appear as courtyards between residential buildings with obvious "Do not enter" or "Do not pass through" signs.

### 3.2. Space use observation

The observation obtained more than 1100 valid space use activities crossing the four selected cases. Table 4 below shows a general picture of the observation in each case.

A general picture of the observation shows that, on average, people spent 80 minutes in the green spaces of the four subsite cases. Female users were a little fewer than male users during the observation, and most of the space users were children younger than ten years old and people aged from 30 to 60 years. People usually came to use the green spaces in a group; only 10% of the users stayed alone. Most people used green spaces to relax or play with their children. Based on the languages appearing in the green spaces, more than 70% of users were Swiss, and the rest had very diverse backgrounds.

The use of green spaces in four subsite cases is different from each other. The comparison across the four cases shows that fewer people used the green spaces in Süsslerenanlage, and most activities were observed in the Bachwiesen due to the variation in space size. However, people spent the most time in the subsite case of Grünau. The average duration crossing the four subsite cases was 80 minutes. People of Grünau and Bachwiesen even spent more than 90 minutes generally. Heat maps (Figure 7) of space use activities in the subsite cases are displayed below. All heatmaps have the same scale representing activity frequency, types and durations.

Table 4 Onsite observation results in four subsite cases

| | Grand Total | Case 1 Grünau | Case 2 Lindenplatz | Case 3 Bachwiesen | Case 4 Süsslerenanlage |
|---|---|---|---|---|---|
| **Observed spaces ($m^2$)** | 318,605 | 119,091 | 67,300 | 92,250 | 39,964 |
| Green spaces | 193,388 | 79,166 | 39,384 | 45,527 | 29,311 |
| Grey spaces | 125,217 | 39,925 | 27,916 | 46,723 | 10,653 |
| **Ave. distance to buildings** | | 188.8 m | 190.0 m | 213.5 m | 194.0 m |
| **Total observed activities** | 1,113 | 124 | 337 | 491 | 121 |
| **Duration (minute)** | | | | | |
| Mean | 80 | 111 | 58 | 96 | 57 |
| Min. | 2 | 10 | 5 | 5 | 2 |
| Max. | 270 | 270 | 255 | 270 | 210 |
| **Gender** | | | | | |
| Female | 47% | 47% | 43% | 52% | 42% |
| Male | 51% | 52% | 57% | 45% | 58% |
| (Blank)[3] | 2% | 1% | | 3% | |
| **Age** | | | | | |
| <10 | 30% | 33% | 8% | 44% | 40% |
| 10 to 20 | 4% | 7% | 8% | 1% | 3% |
| 20 to 30 | 12% | 6% | 11% | 10% | 26% |
| 30 to 60 | 42% | 35% | 61% | 34% | 27% |
| >60 | 11% | 19% | 12% | 11% | 3% |
| **Type of users** | | | | | |
| Group | 90% | 94% | 79% | 97% | 96% |
| Solo | 10% | 6% | 21% | 3% | 4% |
| **Activity type** | | | | | |
| Resting | 444 | 21 | 325 | 94 | 4 |
| Chatting | 110 | 20 | 6 | 53 | 31 |
| Gathering | 67 | 23 | | 36 | 8 |
| Playing | 420 | 58 | 17 | 273 | 72 |
| Walking around | 28 | | 27 | 1 | |
| Walking dogs | 13 | | 2 | 8 | 3 |

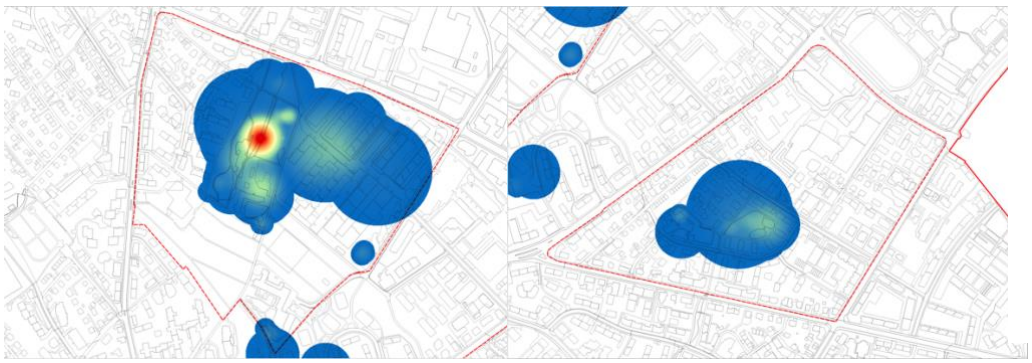
[3] Some toddlers' genders cannot be identified via non-participatory observation. The similar situations happened to the blank information of language as the space users slept or did not conduct any conversation with others during the whole observation period.

| | | | | | |
|---|---|---|---|---|---|
| Exercises | 6 | | | 3 | 3 |
| Cycling | 25 | 2 | | 23 | |
| **Language** | | | | | |
| Swiss German | 726 | 57 | 279 | 273 | 117 |
| German | 54 | 14 | 13 | 27 | |
| Italian | 49 | 23 | 24 | 2 | |
| Spanish | 5 | | 3 | 2 | |
| English | 27 | 7 | 5 | 12 | 3 |
| Hebrew | 70 | | | 70 | |
| Indian | 25 | | 18 | 7 | |
| Others | 141 | 22 | 35 | 83 | 1 |
| (blank) | 16 | 1 | | 15 | |

a. Subsite case 1 Grünau



b. Subsite case 2 Lindenplatz




c. Subsite case 3 Bachwiesen

d. Subsite case 4 Süsslerenanlage

**Figure 7 Space use heatmaps in four subsite cases, based on space use frequency, activity types and durations**

## 4. Findings

The concept of developing the Altstetten-Albisrieden district as a "Garden City" of the Gross Zurich since the 1930s reflects today's actual situation that the average green spaces per resident, excluding closed forests and restored farming fields, is much higher than those of the whole Zurich City[4]. Public green spaces, including city/district gardens and publicly accessible green spaces, are distributed in a way that can cover the whole region. The connections of these public spaces to common green spaces and individual buildings indicate each space's significance while not responding to the space's size. This gap suggests that some public spaces do not function well, either unnecessarily big or too small to service the daily needs of communities nearby. The reasonable provision of size and location could improve the performance of public green spaces.

The total space use activities observed in the Lindenplatz, Bachwiesen and Süsslerenanlage suggested the possible trend that enlarging the size of green spaces could attract more people and stay in the spaces longer. However, this correlation cannot be determined due to the limits of the cases. Moreover, the dramatic drop in the activity frequency in Grünau, though with the largest green spaces, made this trend complex. Some factors may play roles in this regard. First, a community common green space domains the observation area in the case and some large public green spaces with minimal maintenance stand at the case's periphery. Although these spaces are open to the public, very few people not from this community came to use this space. Secondly, as a piece of land isolated by the Motorway, the whole area was developed mainly for industry and commercial with relatively few residents. The entire case of Grünau contains only more than 750 households from two cooperative housing projects and several private housing families, which holds back the use of green spaces. The third reason is attributed to the large public green spaces along the banks of Limmat River close to the case. The prosperous greenery, plenty of open spaces, playing facilities, and water flows there formed an enjoyable place for all types of activities. Under this comparison, the common green spaces in Grünau lost their attractiveness, especially in the summer when the daytime temperature is high. Apart from this, the common green spaces here are also supposed to service a nursing house, a kindergarten and a school during a school semester. A second round of observation in a school period may depict different situations.

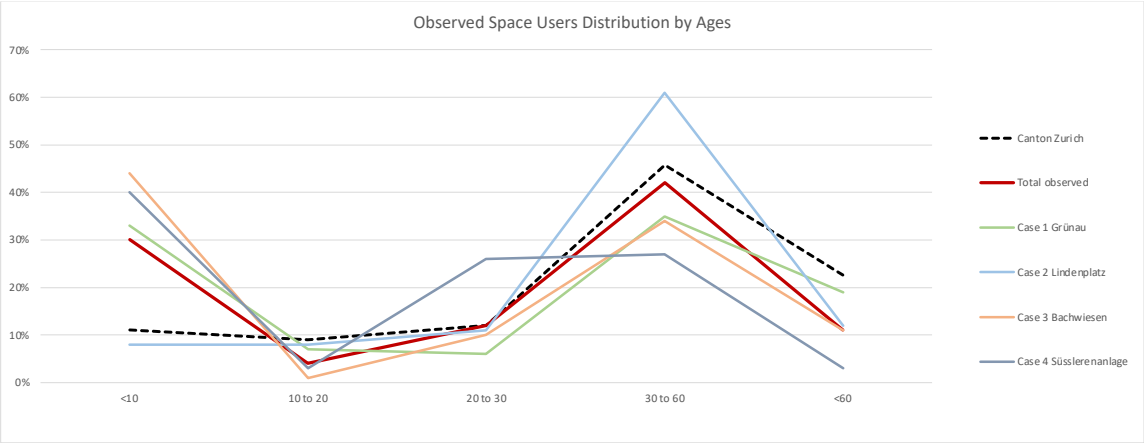



**Figure 8 Proportions of age groups during the observation in the four subsite cases**

[4] The information of green space per resident in Zurich referred to Green Space per Inhabitant in the City of Zurich in Switzerland in 2018, by Category: https://www.statista.com/statistics/860599/green-areas-per-inhabitant-in-zurich-in-switzerland/

Except in the case of Lindenplatz, young children and adults are the dominant space users. Compared with the Zurich population by age[5], it is evident that the observed green spaces were popular among young children. The distribution of the other age groups generally followed the population structure by age in Canton Zurich and varied merely in a particular range (Figure 8). Two exceptional phenomena emerged in the adult group of Lindenplatz and the young adult group of Süsslerenanlage. The very high ratio of adult users in Lindenplatz resulted from the commercial function around the public green space. Many people went to the area for grocery shopping and small gatherings for coffee, drinks or meals. The high frequency of young adults appearing in the Süsslerenanlage might be due to the lack of open spaces for them to gather with music and drinks in the whole area. There were also relatively fewer senior citizens physically using the Süsslerenanlage public green spaces. As a matter of fact, with the interweaving between residential buildings and the public green spaces, many senior residents casually stayed on their balconies and enjoyed the greenery visually. This phenomenon was also mentioned by some people in the other subsite cases but very well observed only in the case of Süsslerenanlage.

The spatial interweaving between private residential spaces and the public green spaces in the case of Süsslerenanlage downgraded this green space from the city level to the neighbourhood level. The obvious evidence is that many people appearing there knew each other, and most of them spoke only Swiss German. They greeted each other, chatted together and randomly organised games to involve everyone.

The case of Grünau stands on the opposite side of Süsslerenanlage. The factors of lacking functional public green spaces within walking distance, utterly open to the public and sharing the space with several urban infrastructures make the common green space of Grünau public. Nevertheless, the visits to the space did not increase correspondently. Except for a family gathering next to the nursing house that lasted for a whole afternoon, the primary activities were contributed by young children and their parents playing next to a high-rise residential tower. It is interesting to notice that there are more than three playgrounds in the case, but only the mentioned one was always fully packed. At some moment, parents even had to find a solution to share some equipment among children. Meanwhile, some scattered playing activities took place in the other playgrounds in Grünau. People using other playgrounds came in tiny groups, spoke languages other than Swiss German and stayed comparatively short. This situation somehow implied that sizeable green spaces with some similar settings could offer equal opportunities to different social groups to use the spaces on the one hand; however, it reduces the chances of bringing people together on the other hand.

The subsite case of Bachwiesen also offers abundant public green spaces and open spaces. Different from the cases of Grünau or Süsslerenanlage, Bachwiesen has unequivocal boundaries between the properties nearby. As the most prominent green patch in the case, Bachwiesenpark divides its green spaces into six sections with various themes, such as open space, playgrounds, bird park, community zoo and club. Except for two birthday parties, people shared space and politely interacted with others. They kept their comfortable distance from others. More than ten languages were heard here, much more than in the other subsite cases. Some social groups travelled a long distance to use the green space here, proving the great acceptance of the space here.

[5] The information on Zurich population by age was extracted from the website City Population: https://www.citypopulation.de/en/switzerland/admin/01__zürich/ , which was summarised from the open-source data of Canton Zurich (https://www.zh.ch/de.html ). The information estimated that in 2021 the population of Canton Zurich consisted of 11% young children aged less than ten years old, 9% teenagers aged from 10 to 19 years, 12% young adults aged from 20 to 29 years, 46% adults aged from 30 to 60 years, and 23% senior citizens aged more than 60 years.

Observation in Bachwiesen also covered the open community spaces and green spaces in the two residential areas next to Bachwiesenpark. The Freilager housing project has very limited common green spaces. Instead, the ground surface is mainly covered by concrete or small pebbles, which turned out to be a supplement to Bachwiesenpark that can support some other types of activities, such as cycling, riding scooters and practising tennis. Accordingly, the green spaces in Bachwiesenpark and the grey spaces in Freilager create a suitable combination. Influent by Bachwiesenpark, Freilager also generates a relatively open and extrovert atmosphere. Well, it is still unclear if other factors play roles in shaping the atmosphere, such as the scale of the project, building typologies, ownership of properties and the age of the project. More studies might follow up regarding this issue.

## 5. Conclusion

This study focused on Zurich's urban greenery in the Altstetten-Albisrieden district in two ways. At the macro scale, green spaces were categorised into three types, public green space, common green space and private green space, according to their ownership and accessibility. The connections among these three green space types indicate the significance of each public green space in the urban structure of the whole district. Based on this connection significance, four subsite cases were selected to further study their social potentials related to micro-scale green space structure. The study discussed social potentials through onsite observation of space use activities.

The study explored the gaps between the structural significance of each public green space and its geometric sizes. These gaps might interpret the performance of public green spaces in the city and suggest that designing public green spaces is more than exploiting leftover urban spaces. The provision of public green spaces shall consider location, size and roles in the urban structure as a whole. This investigation can be extended to the whole city scale. The accuracy of the result can be improved by using actual travel distances, involving public transportation networks and considering various transport means.

There might be a possibility that providing more public open and green spaces can encourage more people to visit the spaces and to stay longer in the spaces. This possibility needs to verify by another round of onsite observation. The correlation between space size, space use frequency and durations must be studied further with more cases.

The four selected subsite cases have their green space structure respectively in terms of the proportions and the relations between different types of spaces. The onsite observation showed that the green space structure could somehow influence the atmosphere of the spaces, the performance of the space concerning space use activities and thus their social potential. Based on the four cases, small public green spaces (Süsslerenanlage) surrounded by private spaces can benefit the particular community exclusively. In contrast, large green spaces with clear boundaries and functions (Bachwiesenpark) can increase the diversity of space use groups. Last but not least, the case studies implied that it is easier to downgrade a green space's accessibility level than to upgrade it. The former might enhance the community (Süsslerenanlage), and the latter would not change much of the situation (Grünau).

As a part of an ongoing research project, the current findings have some limits. The onsite observation was conducted during summer vacation in Europe, which might not be able to ultimately reflect the actual situation of using green spaces in the Altstetten-Albisrieden district. The research team has scheduled to repeat the onsite observation in the Autumn and early Winter this year. The final results might vary due to the observation data's completion. The general demographic information of the Altstetten-Albisrieden district, or more specifically, of the four subsite cases, is missing in the study. This

information may help explain the gender difference and cultural structures; thus, further understanding the green spaces in the four cases supports people's outdoor activities crossing different social groups equally.

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