

Densification of the Existing Urban Pattern: the Case Salzburg

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1 ABSTRACT

Most European cities are facing the challenge of a continuous demand to enlarge their housing stock. Based on the common sustainable development goals, this demand should be created in the range of the existing urban pattern, which means that transformation of areas or the increase of density on underused plots. A town like Salzburg, which is characterized by a high amount of valuable historic buildings and neighborhoods, has also to deal with this question. The strategy of the past years was not to extend the urban pattern in the green surrounding, because of the proximity to the mountains and protected landscape. This paper will give an overview of the chosen strategy and development of the past 25 years by studying 22 different projects. The reason for these projects was, that there are arguments that the densification of recent projects in Salzburg is too high and delivers unsatisfied urban projects. This study is based on an overview of the development of different densities and approach of the projects. The conclusion will discuss the different opinions and will give recommendations about an improved approach to a sustainable future planning.

Keywords: urban pattern, Salzburg, densification, strategies, case study

2 INTRODUCTION

2.1 Densification as a method to reduce land use

In the latest Land-Report of the WWF in 2021 Austria is approved for falling the national sustainability and climate goals. One reason for this development can be followed up by the land consumption, which amounts recently to 13 hectares per day (WWF 2021). The target is 2,5 ha per day, which seems uncertain when and how this can be reached. (Bundeskanzleramt 2020) More than half of the land consumption can be attributed to the building development, which leads in the planning projects and policies to an intensification of densification strategies. These recommend avoiding further greenfield developments, instead they promote the densification of the existing urban structures. Which means that the future development should be focussed within the limits of the city by using different approaches, which are in general similar and have all in common to increase the density (Nagel 2018). There are different methods ranging from adaptation and extending existing building structures to a total reconsideration of the land usage. By increasing the density also another benefit is that more people are living in the city which helps to maintain and sustain other functions, like shopping or retail, which is in general moving to the outskirts of the centers. (Nagel 2018) One consequence of intensive land use is the need to build new roads, which are economically problematic, especially due to the effect of urban sprawl. (Fitz, A. et al. 2020)



Figure 1: Development of shopping and retail services at the outskirts of the cities (Source: Stefan Netsch)

There are two different definitions used in the same way: densification and inner-city development. The aim which both imply is similar, but the difference is that densification is an instrument, which tries to create a higher density by using existing building structures, while the inner-city development on the usage of not or underused plots is directed. (Spitzer et al. 2017) Using the existing building structure is mostly done by extending the roof structures or adding a new floor. Both methods are depending on the existing building structure, while the method where the building is demolished is based on the development of a new building. (Wong 2017)



Figure 2: Extending the housing units by roof-stacking (Source: Stefan Netsch)

The usage of vacant or not properly used plots, like stacking grounds or former commercial areas or football grounds are seen as very suitable spaces to develop in an already developed situation as potential densification cases. Another case of densification can especially be seen in single family house estates, where usually the plot is quite large, and the building is very small in comparison. This is also a potential whereby adding a building the density will be extended.



Figure 3: Densification of a plot by adding a second single family house (Source: Stefan Netsch)

To measure density there are different methods, which are often based on the density created by the building on the plot. This is expressed in the form of the ground space index (GSI) and floor space index (FSI). (Roskamm 2016) Other possibilities the measurement by dwellings per hectare or by the population density per hectare. In opposite to the rational facts of the building, these both measurements give more an

impression about the human acitivity and the usage. (Sim 2019) In general density is related with the factor of developing more floor space, which indicates a greater value for the real estate development (Berghauser, Pont 2009). Next to the discuss of density the discussion of inenr city development is very much linked to the mix of uses. During the post war times most cities in Europe followed the concept of the functional separation, while in recent developments the concepts where influenced by the idea of the compact city (Richter et al. 2018). One of the major topics of the compact city is the implementation of mixed uses within the building or the neighborhood. The purpose of this approach is to fullfill the basic needs, like smaller shops or social services like kindergardens or doctors, of the inhabitants of the neighborhood. The challenge of the densification of the inner city is besides the physical implementation of new buildings and urban structures, also the challenge to provide sufficient infrastructure, such as social facilities or public services. These infrastructures are in demand by residents, especially at the neighbourhood level.(Böhm et al. 2016) The danger is that the densification will lead to an undersupply of this type of infrastructure as the population increases. This contribution will give an overview how this practice is implemented in the urban pattern of the city of Salzburg and indicates some of the advantages and disadvantages, which go hand in hand with the densification.

2.2 Situation of Salzburg

The city of Salzburg is also the capital of the Federal Province of Salzburg (Austria) with about 157.160 inhabitants (Stadt Salzburg 2020). It has with of 2395 inhabitants per km2 about 50% of the density of Vienna, which has 1,9 million inhabitants (It is not a fast growing city and has a moderate growth with around 5-10% (Stadt Salzburg 2020).



Figure 4: Historical inner city of Salzburg (Source: Stefan Netsch)

Between 500 and 1000 new flats were developed annually during the study period from 1994 to 2020. In total 6400 new flats were newly developed. (Stadt Salzburg 2020) Even if Salzburg is not really growing rapidly and the scenic location suggests great land potential, demand for land is great and availability is very limited. The overview of the examined examples show that the focus of the project development is directed to densifying the city and to reuse former used plots for the inner city development. Greenfield development on former not sealed or intended for other uses occurs very rarely and if then on a small scale. Another necessity for inner development in Salzburg is the high protection status by UNESCO. Including the buffer zone, the city has almost 500 ha protected urban structure, which can be developed further, but the conditions are very specific in order to preserve the baroque character of the city. (UNESCO 2017) Most of the first restrictions relate to the design of the façade or the height development of buildings, as various visual axes are to be preserved in the urban area. If projects are implemented in this inner-city area, they will be reviewed by a design advisory board and, if necessary, adapted according to the specifications. (UNESCO 2017)

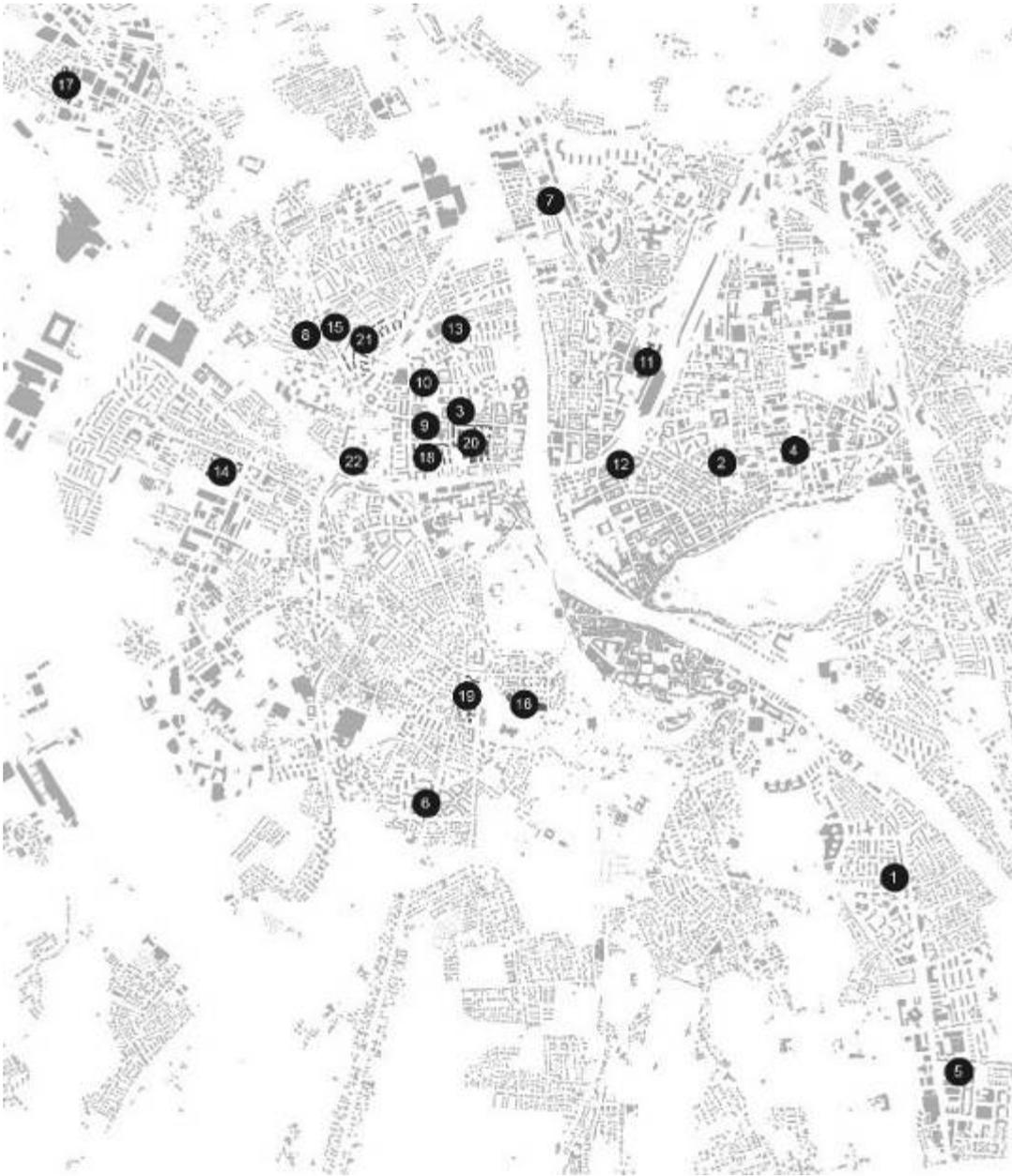


Figure 5: The distribution of the densification cases are concentrated in the northern part of the city of Salzburg. In this area of the city, dense housing is concentrated, whereas in the south there is a transition to the open landscape by means of detached houses. (open access map data retrieved from SaGis; editing by the author)

2.3 Methods

This research in Salzburg was done in 2020 by a descriptive case study approach that pursues a structured comparison of different densification projects. Within the research, 22 examples have been studied, which illustrate the variety and possibilities of densification projects in the past 26 years. The year 1994 was chosen because then one of the first significant projects “Hernau” was realized. The project was carried out in three stages. Within the first stage a desk research was done to map the project and to analyze the basic data (e.g. size, housing units, additional functions, e.g.). The stage of the field work was necessary to conduct an onsite mapping to collect further aspects and data, which was necessary to compare and frame the projects in a bigger picture of the city. In the last step, data which was provided by the City of Salzburg was used to add further data that contribute to the complete presentation of the projects. In some cases, the provided data was checked with local architects, housing companies or the planning department of the city.

3 DIFFERENT CASES OF DENSIFICATION

In total there were 22 cases collected, with the first project finalized in 1994 and the last one in 2020. During this time period there was a continuous development of densification projects, but the realization period is depending on the complexity of the project.

The range of size of the individual projects is wide. It ranges from small interventions with 0.11 ha to new urban blocks with 7.5 ha. The distribution of the individual projects shows that they are mostly smaller projects with less than two hectares total area. In total, more than 46 ha of already developed urban land could be used again. The number of newly created residential units also depends on the respective area size of the projects. In the smallest case this is 12 flats and in the largest case more than 600. This is due to whether only a single building was realized or a new neighborhood. An exception is project no. 4, which was implemented as an office and commercial project. This is remarkable, as these types of projects tend to be located on the outskirts of the city.

	Projectname	Construction Time	Mixed Use	Areasize (ha)	Dwellings	Dwellings/ha	Ground Space Index (GSI)	Floor Space Index (FSI)
1	Zentrum Herrnau	1992-1994	Yes (Retail, Offices, Gastronomy, Bank)	1,8314	86	47	0,27	1,33
2	City 11	2002-2004	Yes (Offices, Surgeries, Bank)	0,9401	84	89	0,35	1,73
3	@fallnhauser	2004-2006	No	0,3439	47	137	0,48	2,40
4	Business Boulevard	1998-2006	No (only commercial)	1,3458	No	No (only commercial)	0,6	2,38
5	Alpensiedlung	1996-2006	No	0,4892	65	133	0,3	1,12
6	Lanserhofwiese	2005-2007	No	7,4993	83 +320	54	0,23	0,69
7	Franz Ofnerstr	2006-2007	No	0,9402	92	98	0,17	1,04
8	Kapellenweg	2007-2008	No	0,3310	24	73	0,23	0,68
9	Esshaverstraße	2008	No	0,1128	12	106	0,24	0,94
10	Neue Mitte Lehen	2007-2009	Yes (Retail, Surgeries, Library, Bank)	2,0876	48	23	0,34	1,68
11	Postareal	2006-2009	Yes (Offices, Retail)	1,6224	104	64	0,56	4,51
12	Humboldtstraße	2008-2010	No	0,2298	60	261	0,53	3,19
13	Parklife	2010-2012	No	1,488	88	59	0,33	1,64
14	Freiraum Maxglan	2011-2013	No	4,9496	356	72	0,15	0,93
15	Kirschgarten	2012-2013	No	0,2458	23	94	0,28	1,11
16	Sternbrauerei	2011-2014	No	1,4107	100	71	0,45	1,81
17	Saalachstraße	2015-2016	No	1,6674	139	83	0,26	0,79
18	Strubergassensiedlung	1950-1962 /2017-18	No	3,3243	636	191	0,23	1,04
19	Riedenburg	2016-2019	Yes (Surgeries, Gastronomy, Kindergarten)	2,8295	316	112	0,25	1,24
20	Stadtwerke	2009-2019	Yes (Surgeries, Laboratory, Retail, Gastronomy)	4,96	581	117	0,50	2,49
21	Glanbogen	1950-1951 /2017-2020	No	5,5326	550	99	0,25	1,00
22	Rauchmühle	2018-2020	No	1,79	220	123	0,26	1,80

Table 1: Overview cases

In summary, conclusions can be drawn from the individual projects for the four following thematic areas, which on the one hand show approaches to solutions, but also point to the issue of inner development, which must be analyzed and solved individually in each project:

3.1 Typology of project

Looking at the size of the potentials to be developed shows the challenge that cities like Salzburg have to face. The size of the respective inner development projects is getting smaller and increasingly concentrated on the level of a single plot of land. Larger brownfield developments are becoming increasingly difficult, as much of this space has already been activated in the past. This challenge “finding new spaces” for inner city development a lot of cities are facing. At present, the availability of land is also becoming increasingly difficult due to rising property prices.

If it is not a single plot, which can be used as a kind of infill development, the tendency is to great projects, which do not only serve the inhabitants of the neighborhood, but also on a wider scale. In larger projects such as Maxglan (No. 14), it becomes clear that the offer in addition to housing like kindergarten or the generous open space is not only intended for the residents of the project, but also for those who live in the urban neighborhood.



Figure 6: Development of social infrastructure to provide services for the neighborhood (Example 14)



Figure 7: Addition of the existing urban structure (Example 12).

The possibilities offered by inner development go far beyond the mere production of living space. They offer the chance to solve the deficits that exist at the level of the urban district. In most cases, it is a question of creating infrastructures that serve the public, such as public spaces or social infrastructures (e.g. kindergartens, playgrounds, etc.).

Density

The density values of the projects show a broad range of different GSIs and FSIs. However, the statement of the values is limited to purely factual statements and less about the perception of the current density in the context of the project. It is difficult to make a statement about the quality of the project purely on the basis of density values. Rather, the actual project must be perceived in the context of its surroundings. This becomes clear in the case of project no. 11, for example, which on the one hand has a high density due to its central urban location, but on the other hand is also due to the urban planning situation. Because of its size, this project contributes to the continuation of the urban structure. The totality of the case studies shows the great diversity of the density values achieved, even if the project areas are comparable

The real differentiation takes place through the production of the number of housing units. However, a high number of dwellings does not necessarily mean a high density of use by residents. Much more remarkable as a result is that most projects achieve a density of 80 to 120 dwellings per hectare. It can be concluded from this that the normative information from development plans does not necessarily contribute to the perception of density, but that other parameters are also important.

3.2 Open Space

The challenge of free spaces in the projects is manifold. They have the fundamental task of providing internal access, but on the other hand they are also an indicator of the quality of stay. In addition to seating and bicycle stands, many projects also have the option of play areas. The differences in the type and design of the public spaces vary in the sample collection greatly in the projects and depend on the type of spatial context. The spectrum ranges from large park-like areas (No.14), to small-scale green and play areas, to urban outdoor spaces like No.20.



Figure 8: Public Spaces in the Riedenbug (Example 19)

The diversity in terms of project size and type also has an impact on the type of publicly accessible space available. In the development of a single plot of land, residential open spaces are particularly developed at ground level, leaving little space for the public. However, in projects where an almost park-like green space has been developed, it can be assumed that this is also useful for the neighborhood.

3.3 Mixed Use

One of the key factors of the compact city is the variation and combination of different usages. Particularly in the first-floor zone, it is evident that in the urban area a use that attracts the public often contributes to the

revitalization of the neighborhoods. In addition to retail, this can also be everyday services, such as laundries, post offices, etc. In many cases, the floors above are occupied not only by residential units but also by other facilities such as offices (e.g. architects, lawyers, etc.) or doctors' surgeries. This direct combination of uses with housing means that many routes can be eliminated.

Within the implemented projects, different uses are brought together. It is obvious that the majority of the projects were implemented with usage on housing (n=15). Only a small number, such as project no. 1, show a mixed use with residential and mostly commercial use. Project No. 4 is an exception with purely commercial use, which was implemented in the urban area.



Figure 9: Different uses of the basement zones (Example 20)

The example of the Stadtwerkareal shows the positive mix of uses. Since this part of town has a very high population density, uses in the first floors that contribute to the support of the residents are particularly important in addition to the public spaces. Therefore, many community facilities are located there, ranging from the district office to homework supervision to rooms that can be rented temporarily. It is undisputed that one of the central problems of mixed use is that the spaces in the first floor zone are usually difficult to market and are only suitable for living to a limited extent. For this reason, many projects also forgo mixed use, which is also challenging in terms of floor plan development.

4 CONCLUSION

The densification of neighborhoods in the inner city pattern has a lot of advantages, like the reduction of land consumption, the addition of new housing units or the extension of usages, which are needed on a wider scale. But especially the existing infrastructure needs a special attention, because it is successful to use the technical infrastructure like roads, sewage installation, etc. or the social infrastructure like kindergartens, schools, playgrounds, etc. more efficiently. But it needs a careful planning because there is the threat that by an too intensive densification of an overloading of the existing structures. It is therefore necessary to look at inner development on a larger scale.

Density in particular is viewed critically in many projects and also leads to their rejection. However, in many cases it is not the density itself that is the problem, but rather the increased burden it places on public space or streets. This leads to a negative perception, which could, however, be taken into account in planning.

The problem, however, often lies in the fact that it is a matter of individual projects that only appear to be problematic in their entirety because they are embedded in the neighbourhood.

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