Christburger Straße

Berlin

Quiddestraße

Munich

Friedrichstraße

Berlin


Il suonatore di liuto (1594)
aricchite
nicaraguense.
ità e persistenza
andorla e cacao.

Im Tal

Munich


Aida
PROUSEK & CO
Aida
Aida
Geschenkideen

Quiddestraße

Munich

Kanzleistraße

Zurich

Berlin

Hochsitzweg

Kanzleistraße

Zurich

Meierwiesenstraße

Zurich

Bahnhofstraße

Zurich

Spiegelgasse

Zurich

Larochegasse

Vienna

DENSITY & ATMOSPHERE

(Ed.)
Dietmar Eberle

On Factors relating to Building Density in the European City

(Author)
Eberhard Tröger

BIRKHÄUSER
BASEL

Contents

DENSITY CATALOG

THE ATTUNED CITY

Dietmar Eberle

Baptistery of the Cathedral of Brasilia

> "And that is what is so mysterious about new cities, that initial lack of speech, just before the beginning, when the first word is still to be said. No matter what, there is always a first word." [1]

In his essay "Ex Nihilo," on the creation of the two newly planned and constructed cities of Chandigarh in India and Brasília in Brazil, Dutch author Cees Nooteboom employs the word "mood" in its most literal sense. Both cities were created on the drawing board of famous architects and urban planners in an era when there was belief in a new world that would be "healed" by a completely new approach to urban planning and architecture. Chandigarh was founded in 1952 as the new capital city of the Indian state of Punjab on an open plain near the eponymous village. The architect Le Corbusier developed the plan for the urban structure and most of the public buildings. Brasília evolved from the idealized plan of Brazilian urban planner Lúcio Costa, who designed the Plano Piloto with two intersecting main axes in 1956 to be constructed in the then-virgin red soil of the high plain in central Brazil. Today, the city is especially famous for the striking buildings by Oscar Niemeyer, who was then the director of the State Building Authority for Architecture.

The aim was that the two cities would serve a forward-looking free society and organize people's lives in this sense, implementing lasting improvements. However, anyone walking through the two heroic planned cities today is struck by two factors. First, the avant-garde spirit of the architects still permeates the broad street axes and the daring building forms; it seems like a promise that—long since grown tired—still awaits its fulfillment. Second, humans and nature have settled into this artificial abstract structure, adapted to it, and re-shaped it. Nature has found its way into the city, and the mass of incoming people have surrounded it with a vast belt of pragmatic, humdrum, satellite cities and slums. The residents have raised their voices and tried to harmonize the city with their own needs and desires, at times helplessly, at times forcefully against the original intentions of the planners.

> "Practice, or let us simply call it life: life as an extension of the architect, an unexpected and unpredictable henchman." [2]

In today's democracies, cities like Chandigarh and Brasília in their radical expression all defined by a single person are no longer imaginable. And despite, or perhaps because of, their aesthetic and spatial power, they are now heavily criticized as purely intellectual exercises in urban planning. Their monumental scale makes it difficult for residents to appropriate the city for their own uses, functional separation runs counter to the natural patterns of daily life, and the rigid idealized structure resists adaptation to new requirements, to name but a few of the challenges. Yet what have planners and architects learned since then?

In Europe, at least, few cities are erected on virgin building land, but even in Central Europe, urban expansion is growing rapidly. New residential districts and office complexes are being built in central locations and also on the proverbial "green meadow" on the urban periphery. Construction site panels and glossy advertisements promise a forward-looking and better life in these districts. But the rapid rise in area use associated with these expansions is not caused by excessive population growth; it is spurred on by the higher demands of residents and the constant increase in the demand for living space per resident.[3] Migration between regions and states and between rural and urban areas, which leads to increased traffic and urban sprawl, are also highly influential factors. And the expansion of the transportation network makes faster connections possible between locations that were once far apart.

Mobility has become the key issue in the appearance of our settlement areas. It promotes the dissolution of a traditional view of the clearly delineated city; across large areas it leads to very low building densities, which are neither city nor country and are instead described with somewhat vague terms such "agglomeration," "urban sprawl," "urban landscape," or "in-between city." Simultaneously there is a demographic shift in the social structure in the Central European city. The average age of the population is rising.[4] The number of households with only one to two inhabitants is predominant in cites, while agglomerations are by and large home to small families with usually just one child. These factors, along with decentralized work opportunities, change the demands made on our built environment. In addition to a dense public transportation network, walkability scores to key services such as schools, childcare, and shopping are becoming increasingly important. In other words, a reduction of the true distances is indispensable. However, this can only be achieved through an appropriate building density, which is the key parameter for city planning. The density is calculated on the basis of the floor area ratio, which in this book

is applied for the first time to the totality of a defined urban area, including its public spaces. Thematically, the term "density" as it is used here is understood as land use in relation to social use on an individual basis.

Which density corresponds to which society and how does it affect the atmosphere of a district? That is the fundamental question explored in this book. For atmosphere as subjective perception of the urban environment is the basis for the acceptance of a district, whether it is a newly built district or an existing district undergoing conversion or regeneration.

> "Architecture sketches are always silent, whereas cities never are." [5]

Anyone trying to walk under the blazing sun across Brasília's vast axes, from one of the large buildings blocks to another set some distance away, is likely to get lost in the monumental scale of this urban structure. At their drafting tables in far away Rio de Janeiro, Costa and Niemeyer had put their faith in the automobile as the individual, autonomous, and rapid mode of transportation of the future and had conceived Brasília as the model city for this life of the future. To this day, the structure of many European cities is characterized by the same belief—a belief now contradicted by the changed requirements of contemporary society.

This book seeks to investigate and trace the relationship between building density and atmosphere in Central European cities. Its working thesis is: Density determines the atmosphere and character of an urban district.

However, the data on this relationship are still sparse, and analysis tends to be only quantitative. There is still a lack of qualitative analysis. Until now, it has hardly been possible to provide clear answers as to the quality of this relationship. This comprehensive study is therefore focused on correlating the hard facts and objectively measurable factors to the subjective perception of atmosphere. To this end, nine density categories are defined and a specific character is then assigned to each category.

In order for this approach to be useful for research, clearly defined parameters for classification and evaluation are required. Meaningful analysis factors and deliberately comprehensive data are therefore employed to study existing districts from different periods in the four example cities: Berlin, Munich, Vienna, and Zurich. The atmospheres of the various districts in the four cities

are described and then evaluated with regard to their influence on the mood of an urban district. This is a holistic approach to urban spaces with clearly delineated perimeters. The approach leads to the identification of criteria that can help to provide the conceptual basis for creating a suitable atmosphere when planning future districts or for processes of densification or conversion of existing urban structures. For, in the future, qualitative topics in urban development and the subjective perception as a social component will become ever more important.

Persons as residents remain the measure of things. In his essay, Cees Nooteboom is interested in the two planned cities of Brasília and Chandigarh because they were created ex nihilo—out of nothing—and because the planners had to discover their own criteria for the cities' structures. As a synonym for the fleeting and elusive phenomenon of atmosphere, he employs the notion of "mood" in a literal sense, with persons taking center stage as social beings capable of communication. By raising their voice in the space of the city, the residents establish a relationship between planning and reality, between drawing and human being. They set the mood in their environment. This study therefore focuses on the public space as a common area for leisure, meeting, and communication. It is in the public space that the qualities of a district are measured, and that is where its specific atmosphere emerges. This book aims to make a fundamental contribution toward finding a planning language that will set the mood in new cities even before they are built, and to help them develop a harmonious atmosphere once they are built—step by step and word by word.

> "A city is the accumulation of everything that has ever been said there, every word spoken, a proclamation, an outcry, a death sentence, a prayer, the whispering of lovers, the groans of the sick, a drunken argument, a parade with chants and songs: all of these sounds combine to form a ceaseless litany that has always accompanied the history of the city over the centuries, and continues to do so, a conversation that will never end as long as the city continues to exist." [6]

1
Cees Nooteboom, “EX NIHILO: A Tale of two Cities” in Iwan Baan, Brasilia-Chandigarh: Living with Modernity (Lars Müller, 2010), translator of Nooteboom essay Laura Wilkinson, p. 114.

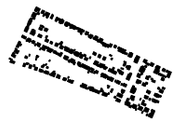
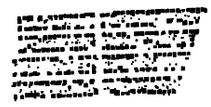
2
Ibid., p. 118.

3
In Switzerland, for example, the demand for living space per resident has increased over the past 30 years from 34 to 45 square meters per resident, that is, by a factor of 1.3.

4
More than half of the population is over 40 years of age in Switzerland, for example, and the trend is rising.

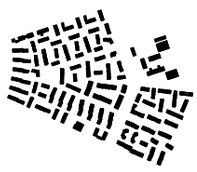
5
Nooteboom, op. cit. p. 111.

6
Nooteboom, op. cit., pp. 112f.

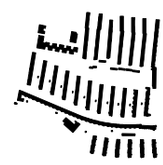




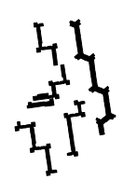






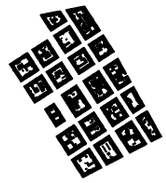
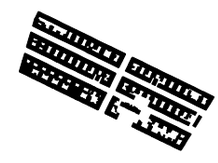





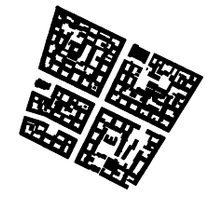












DENSITY ANALYSES

INTRODUCTION

“You just have to get through it”[1]

The spatial expanse of urban development in Central Europe is steadily growing. This creates a fear of losing natural landscape areas and precious land resources. At the same time, we bemoan a dearth of atmospheric ambience in our unstructured and sprawling cities. We have tolerated unfettered urban sprawl as a necessary evil for too long. The calls for new limits and urban densification can now no longer be ignored. Nevertheless, we are unwilling to foresake individuality and growth.

The discussion on the extent of urban density in our cities is a central topic in the daily press and trade journals. What is lacking, however, are measurable criteria with which to choose the correct density for each respective situation. By establishing a relationship between urban density and atmosphere, this book aims to establish the foundations for a new integrated design of our urban spaces.

Butterflies, Gravel Pits and Dreams of a Home

> “Come on out for a change. You’ll see it’s real nice here in the country. Why don’t you come on out sometime, so you can also get to see a butterfly? It’s beautiful here. It’s a green belt, you know…”[2]

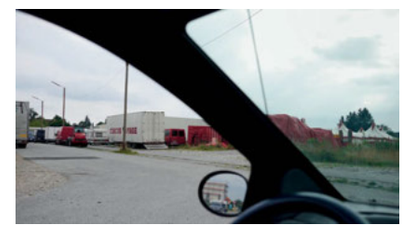
In his 1984 piece “Die Wegbeschreibung” (Driving Directions), Bavarian comedian and satirist Gerhard Polt described with merciless accuracy what has long since become a daily reality for many Europeans: Mr. König, the main protagonist played by Polt, has moved into a new small row house on the periphery of Munich and gives his friend Hilde directions on how to drive from the city to his new place “in the country” for a visit. The route involves numerous highway ramps, and travels past high-rise developments, mixed-use areas, gravel pits, industrial parks and single-family home subdivisions until finally arriving at the much praised row house with a tiny patch of green in the front yard. Hilde’s journey turns into an expedition through the urban sprawl that makes up much of the contemporary cityscape. Polt succinctly identifies the key issues with which those responsible for city and land-use planning wrestle more than ever today.

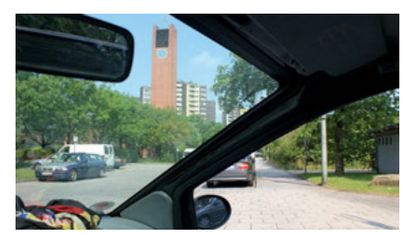
> “Anyways … after the trailer park, you’ll drive towards a shredding facility, ok … and next door there’s a hazardous waste disposal plant. But you can’t drive in there, you know, anyways you have to go past it on the right. Then it’s gonna start getting a bit more rural. You’ll start to feel that you’re getting away from the city.”

Mr. König’s driving directions through the agglomeration derives its playful malice from the close observation of the realities of urban planning (in the film footage, an actress is shown driving the route in real time, precisely as described)* and the optimistic enthusiasm the fictional new homeowner shows for these environments. High-rise developments are called “Am Jagdfeld” (Hunting Grounds), churches look like “chimney stacks”, and young families live between a big box-furniture store and a truck manufacturing plant in the “second set” of new high-rises. As for the industrial areas, well, “you just have to get through” them. None of these absurdities can rattle Mr. König’s unshakeable optimism. On the contrary, he waxes enthusiastically about giant hydro towers and a concrete plant with “all the bells and whistles”.

1
Gerhard Polt, “Die Wegbeschreibung” (“Directions”), in “Fast wia im richtigen Leben” (“Almost Like in Real Life”), tenth episode, Bayerischer Rundfunk, 10 December 1984.

2
Ibid. All following quotes without footnotes are from the same source.

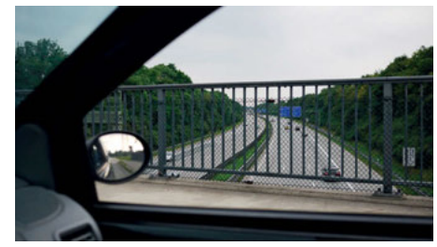




*
Thirty years after Gerhard Polt’s “Wegbeschreibung” (lit. “Driving Directions”) was first published in 1984, we reconstructed and once again followed Hilde’s route from the ring road to the row-house idyll through the agglomeration surrounding Munich. The series of photographs accompanying this chapter were taken during this drive in 2014 and documents the current state of the ongoing development of our cultural landscape in all its facets.

Even the massive jumps in scale with regard to form and content fail to shake his equilibrium. At least the Zaunkönigstraße (named after a tiny song-bird called “the king of the fence”) serves as an orientation, and the custom-made “brass doorknob” adorning the otherwise mass-produced row house serves as a kind of anchor in the confusing “hodgepodge” of the late-capitalist urban landscape.

> “I’m not really into country life, you know, but it’s so much better for the children … Right now, we’re still a little out of the way here. But in a year and a half, it’s all gonna change, ’cause they’re expanding the highway to six lanes, right to our doorstep. Then it’s gonna be a cinch to get into the city, you know…”



In all this, as a new resident on the periphery, Mr. König is not even “into country life”. It’s all for the children, and soon the expansion of the six-lane highway will rescue him from the remoteness of this “rural” row-house idyll. The functions of the city are tidily separated from each other; without a car, the suburban dweller is lost in the ever-expanding sea of urban sprawl.

Polt’s darkly humorous narrative reveals the deep yearning of post-modern individuals for a place to call their own in this world of constantly growing possibilities. Everything has to remain available, and to this end people are willing to put up with quite a bit. This is why the row-house dweller can summon enthusiasm even for massive warehouses and truck manufacturing plants. They are the economic guarantors for his rural idyll with city links. As such, the necessities that evoke admiration, or at the very least have to be tolerated, are neither ugly nor beautiful, but simply “enormous”. Based on this type of acceptance, optimistically geared towards ensuring one’s personal wellbeing, a new kind of residential development has steadily spread since the 1970s, aptly and bluntly described by Polt as “hodgepodge”, while contemporary planning experts refer to it as “urban sprawl”. It is neither city nor country, but forms a third category which springs precisely from this yearning, seeking to satisfy as many of the constantly increasing demands as possible, and all the while tolerating the means required to achieve this state of affairs as a necessary evil.

> “Keep going… Then there’s another industrial park.”

However, aspiring for ever more naturally has its limits. The resources of land, raw materials and energy are not inexhaustible, and after decades of tolerating the means in favor of economic growth[3] a plateau in the meantime seems to have been reached for clients, planners, communities and residents, which has lead to an urgent quest for alternative solutions for coping with population growth, the rise in economic spending power and the attendant desire for ever more living space.[4] At the same time, the demand for sustainability is omnipresent and impossible to ignore. But our economic system is avaricious, and attempts are underway to productively appropriate this nebulously defined term. Sustainability is “in”, but only if it doesn’t require any sacrifices.

> “And then you drive through one of those commercial mixed-use areas … Well, it’s a bit of a hodgepodge …”

However, the “hodgepodge” style of housing that goes hand in hand with this attitude cannot deliver on the ideal of a less fettered lifestyle

3
In the interest of ensuring quick and economically efficient land use, there was for a long time a practice of failing to draft comprehensive and forward-looking spatial plans. This inadvertently promoted the creation of precisely the kind of urban “patchwork” of individual spatial plans without any overarching integration that Gerhard Polt describes so aptly in his “Driving Directions”.

4
Living space requirement grows exponentially to population growth. For example: whilst the population of Switzerland has grown from roughly 6.3 million in 1980 to 8.2 million in 2013 (source: Federal Statistical Office, Switzerland), thus experiencing a growth factor of 1.3, the requirement for individual living space has grown from 34 to 45 square meters over the same period by approximately the same factor.

for free consumers in a landscape of constant growth. The “country life” does not play out in the green belt filled with fluttering butterflies invoked by Polt’s protagonist. Instead of colorful insects, airplanes thunder over a carpet of row houses, high-rise developments, old town cores, industrial complexes and the wastelands that lie between. And the “six-lane highway” has morphed from a traffic solution to a traffic and energy problem. It generates kilometer-long traffic jams, environmental pollution and exorbitant maintenance costs.

This discrepancy between demand, yearning, and reality is increasingly worrisome to urban planners. In addition to the destruction of valuable resources, they bemoan the lack of a sense of place, the structural isolation and the absence of atmospheric qualities. As a result we are engaged in a desperate quest for workable urban forms of societal and social cohesion and a desirable urban form for the future.

> “Now, you’ve pretty much arrived… And there it is: ‘In the Meadow’… You can’t miss our place, ’cause we’ve got a brass doorknob…”

In this quest, it is the “soft factors” of subjective urban perception and experience—such as well-being, urban character, identity, quality of living and atmosphere—which are becoming once again prized in affluent Central-European society, occupying an equal position with the more objectively measurable values of urban planning. The wish, ideally, is to incorporate atmospheric factors into planning in order to create a more agreeable local district atmosphere. However, these factors are somewhat difficult to evaluate and describe: after all, they are first and foremost dependent on the subjective perception of individual residents or passers-by, and cannot be quantified in a more general or universal manner. Yet suitable solutions for larger urban areas must achieve a broad consensus among residents. Not everyone is content with a polished “brass doorknob” as an individual site marker within an increasingly complex world. Conversely, certain combinations of objects with specific qualities are indeed able to create continually recurring atmospheres that reach beyond subjective individual perception to be roughly interpreted in the same way by the majority of residents. Building density could be one of the main criteria by which to generate this kind of “objectively perceptible atmosphere.”

Polt’s “Driving Directions” dates from 1984. Three decades of growth and much procrastination later, it seems that we are finally forced to no longer tolerate the mentality of “you’ve just got to get through it” and are asking the fundamental questions we have thus far avoided, such as how and how densely we want to dwell in our growing cities.

> “You’re coming, right? We’re so excited!”

“Wouldn’t you just love it?”

The problem of the idealization of demands with regard to one’s personal living environment is hardly new, for it is intimately connected to modern society and its striving for individuality and affluence. Nearly a century ago, at the time of the so-called classic modernism at the end of the 1920s, another prominent German satirist whose wit was no less acerbic and amusing than Polt’s perfectly captured the mounting ambitions and demands of the population at large. Kurt Tucholsky

described the ideal of the German bourgeoisie striving for evermore wealth in his poem “The Ideal” from 1927:

Ja, das möchste – Wouldn’t you just love it?
A villa with large terrace in the country,
The Baltic out front and the Friedrichstraße out back;
A beautiful view, fashionably rustic,
With a glimpse of the Zugspitze from your bathroom
But only a short walk to the movies at night.

All of it simple, and oh so modest:
Nine rooms – no, make that ten!
A roof patio with oak trees standing tall,
Radio, central heating, vacuum cleaner,
Servants, obedient and silent,
A sweet wife, full of spirit and passion
(And another for weekends, just in case)
A library and all around
Solitude and bumblebees buzzing.

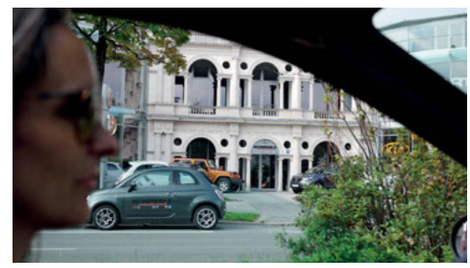
In the stables: two ponies, four thoroughbreds,
Eight cars, a motorcycle – with you at the wheel,
Of course – that goes without saying!
And in between you go hunting big game.

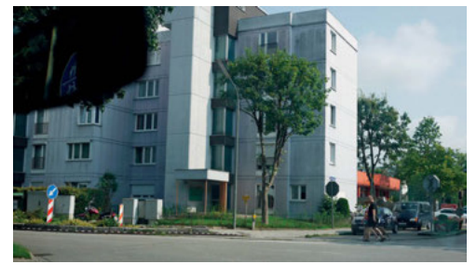
But wait, I nearly forgot:
Haute cuisine – the best of the best –
Vintage wines poured from a beautiful decanter –
And you will remain as thin as a rail.
And money. And just the right amount of jewelry.
And another million and then another million.
And travel. The jolly kaleidoscope of life.
And splendid children. And everlasting health.

Wouldn’t you just love it!

But here is how things are on this earth:
At times it seems that earthly happiness
Is only doled out peu à peu.
One bit or another is always missing.
When you’ve got money, you’ve got no Molly*;
When you’ve got the girl, you’re out of dough –
When you’ve got the geisha, you’re bothered by her fan:
We may have the wine but no cup, or the cup but no wine.

There’s always something. Take heart.
All happiness comes with a sting.
We want so much: To have. To be. And to count.
For someone to have it all:
That is rare.





Who wouldn’t love such a comfortable life in a “villa with large terrace in the country, the Baltic out front and the Friedrichstraße out back”? Ever since a broad sector of the population began to be able to dream this dream thanks to growing wealth, the desired villa has become for most at best a prefab single-family home, striving for individuality through bright colors and shapes, and seeking to compensate for

* **Molly: a female name, also used in slang to describe the ideal girlfriend. “Utter perfection. If you let this girl into your life you will never regret it, she’s incredible and so beautiful, everyone should have a Molly.” [source: urbandictionary.com]**

the poor quality of the external environment through technical upgrades of the interior spaces. Instead of gazing at the Baltic Sea from our patio, we sit in our air-conditioned homes in front of our very own multimedia systems and take the odd weekend excursion to recreation areas marred by high-tension lines overhead. And if we have the desire every now and then to take in a movie on downtown Friedrichstraße, we are dependent on a highway or at the very least on a bus or train connection.

The mobility associated with this lifestyle is another steadily increasing challenge in today’s urban planning. Road and public transportation networks are constantly being expanded and have become key positioning factors for land use and development. Thus a house that was until recently still an hour’s distance from the commercial center of the nearest city, is suddenly within a travel range of only fifteen minutes thanks to a commuter rail link, which in turn ushers in a rapid and noticeable transformation of the built environment around the house and the mix of residents.

How can contemporary urban planning respond to this complex mix of vastly different ingredients? Various approaches—from Gründerzeit[5] block-edge developments, to modernistic row housing or compact housing blocks modeled on late modernism, to new high-rise districts—all are being simultaneously exploited by today’s urban planners. The debates accompanying these approaches are testimony to the nervous helplessness in the quest for an up-to-date image of the city. Today, planners unanimously condemn sprawling carpet developments of single-family homes and demand “urban densification”. However, the form and quality of such densification remains unclear, and convincing solutions are in high demand.

5
The Gründerzeit (lit. Founding Epoch) is the term used to describe the period of rapid industrial and urban expansion in Germany and Austria (i.e. Central Europe) in the latter half of the nineteenth century, interrupted by the stock market crash of 1873. In terms of urban planning it includes the new factor of rapid mass transportation and vehicle-friendly (i.e. broad) streetscaping, and in architectural terms it roughly corresponds with the various historicist architectural styles in Great Britain and the United States that are understood under the description Victorian Era.

Magic Formulae

It was precisely during Tucholsky’s era[6] that the visionaries of the architectural modern were confronted with similar problems. On the one hand, the population at large had, even then, already begun making increasingly individualized demands on their living environments. On the other, cities were faced with the massive social, infrastructural and public health challenges arising from exploding population numbers in the cities due to the rural exodus. Paradoxically, with their all too idealistic responses they unwittingly prepared the ground for the amorphous new development structure, which once again now confronts us with the same fundamental question as then: how can cities grow quickly and sustainably, while being and remaining worth living in?

6
Tucholsky’s poem “Das Ideal” (“The Ideal”) dates from 1927; the Athens Charter was launched in 1933.

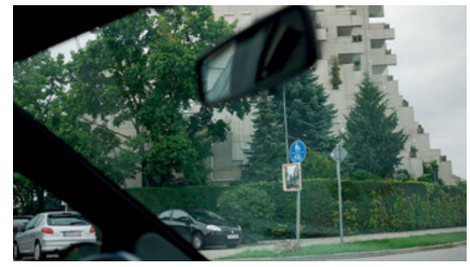
The members of CIAM (Congrés Internationaux d’Architecture Modern or International Congresses of Modern Architecture) once dreamt courageously and confidently of a completely new city that would solve all problems in a single stroke. In 1933, under the leadership of Le Corbusier, they drafted their urbanist manifesto The Athens Charter,[7] which ushered in an entirely new vision of the city. Upon re-reading the text today, one discovers striking parallels with the problems of the current urbanist debate, albeit seen in terms, some of which are the exact opposite of currently held views.

7
Le Corbusier, The Athens Charter (Grossman: New York, NY, 1973), translated from the French by Anthony Eardley. All subsequent quotations in the English edition of this book are taken from this translation.

The charter contains the following core statements or observations on the status quo of cities at the time of its drafting.

On Densification:

> Observation 8: “The advent of the machinist era has provoked immense disturbances in the conduct of men, in the patterns of their distribution over the earth’s surface and in their undertakings: an unchecked trend, propelled by mechanized speeds, toward concentration in the cities, a precipitate and world-wide evolution without precedent in history. Chaos has entered the cities.”
>
> Observation 9: “The population is too dense within the historic nuclei of cities, as it is in certain belts of nineteenth-century industrial expansion—reaching as many as four hundred and even six hundred inhabitants per acre.”



In the charter, the problem of unstructured agglomeration and urban sprawl is lamented as follows:

> Observation 11: “The growth of the city gradually devours the surrounding verdant areas of which its successive belts once had a view.”
>
> Observation 20: “The suburbs are laid out without any plan and without a normal connection to the city.”

And the charter identifies the social and psychological problems of the city at the time:

> Observation 71: “The majority of the cities studied [by the Fourth Congress] today present the very image of chaos: they do not at all fulfill their purpose, which is to satisfy the primordial biological and psychological needs of their populations.”
>
> Observation 72: “This situation reveals the incessant accretion of private interests ever since the beginning of the machinist age.”

Based on all these observations, the CIAM conference draws the following highly political conclusion in its final observation:

> Observation 95: “Private interest will be subordinated to the collective interest.”

As we know today, it was somewhat premature to formulate this observation as a certainty at that time. Socialist models of society were unable to satisfy this urgent wish despite enormous efforts. And globalized western consumer society is confronted more than ever by the barely controllable “incessant accretion of private interests”. Nevertheless, the CIAM Charter has shaped and changed the image of our cities and landscapes more enduringly than any other twentieth-century manifesto.

The most urgent problem of the day at the time was excessive density in urban cores, which led to social, hygiene and the associated health problems, and which allowed the cities to grow with a hitherto unknown speed—like metastasizing tumors spreading across the surrounding landscape.

The fear of chaos, which gripped a large proportion of the society at the time, prompted people to call for radical answers. The malignant tumor was to be excised to make way for an ordered and healthy

configuration in which people could dwell peacefully. Thus architects, too, embarked on a quest for a magic formula to provide a solution for the social and urbanistic tasks ahead. The charter did so in a manifesto-like form, stating concrete observations and requirements:

The formula for spatial planning:
Requirement 1: “The city is only one element within the economic, social and political complex which constitutes the region.”

The formula for architecture:
Requirement 29: “High buildings, set far apart from one another, must free the ground for broad verdant areas.”

The formula for urban planning:
Requirement 32: “A just proportion of constructed volumes to open spaces—that is the only formula which resolves the problem of habitation.”

The distribution of the building masses in their relationship to the open, unbuilt area (which should ideally be natural area) was recognized as the decisive factor in finding a solution for the problem of allowing cities to grow rapidly in a sustainable fashion. Every resident was to be given the opportunity to lead a healthy life with light, air and sun in a green environment. The fathers of the charter regarded the specific density of the built environment as the magic formula for the future of cities.

The requirements or demands developed as a conclusion from these observations are widely known. The uncontrolled and unstructured sprawl of city clusters was to be untangled, organized and divided according to basic functions—housing, leisure, work, traffic and the historic heritage of the cities. As a connecting system, transportation was given a central role, for the new buildings were to concentrate as much building mass as possible on a relatively small footprint[8] and leave a large space open for fresh air and sun, which translated into long routes between not only the buildings themselves but also between the functions—between home, work, shopping and cultural institutions. In keeping with the logic of the “machinist age”, autonomous “habitation machines” strung along supply chains were to be embedded into the landscape. Movement between the building units, some at considerable distance from each other, was to be by motorized transportation of some kind.

However, to begin with the implementation of this magic formula seemed unthinkable as it would have required massive demolition and expropriation in the cities. Only with the large-scale destruction of the Second World War and the sweeping political changes that followed the war could the CIAM ideas be more broadly realized in the wake of recons truction in the eastern-socialist as well as the western-capitalist system.

But the formula would appear to have failed. The new urban structures encouraged the formation of islands of urban development, which continue to characterize the structure of the expansion zones of our cities to this day. Instead of a built continuum of the European city, historically built around a central core, what emerged was a web of traffic networks along which an extremely heterogeneous built environment spreads outward into the landscape without any discernable center or core.

8
In comparison to the scale of the buildings, the footprint of the built-over area is very small.

The fundamental urban planning issues, however, seem to be the same as in the era of Le Corbusier. Issues like the form of the rapidly expanding city, the separation of housing developments and landscape, the distribution of private and public space, and the functional organization of the city are once again on everyone's lips. Today the solution for these problems is being sought in the "correct ratio of building mass to open space".[9] However, where the focus in the charter was on open, that is, unbuilt space, the new magic formula for urban planning is seen in densification and mixed use.

9
Le Corbusier, The Athens Charter, observation 32.

Densification – Phobia, Compulsion and Lifestyle

Calls for densification have been growing ever more urgent in recent times, born out of a fear of the unchecked growth of agglomerations, which are randomly spreading across the landscape and no longer reflect any social ideals. These demands are falling on willing ears, not only because of arguments of land and energy conservation. For some time now urban planners and architects in particular have idealized the lose term "urbanity"[10] as the definitive up-to-date form of living without precisely stating what this mostly subjective and rather vague term means.

10
For further detail on this term, see the section on "urbanity" in the chapter " 4 Cities, 36 Urban Perimeters, 13 Analytical Perimeters, 9 Density Categories"

Contrary to the ideas put forth in the Charter of Athens, today's planners identify the qualities of urban life not in having access to fresh air and nature, but instead in appropriately compact developments with the highest possible density. In addition to limiting the area for development, density in the built environment as a deliberate "(re-)urbanization" is intended to lead to greater social density and integration within cities, and to counteract the self-centeredness of individualization and privatization. After the failures of the divided, dispersed city of the modern era and the formalistic experiments of post-modernism, the new approach to solving the problems in many places is to return to the traditional European image of the city. The block edge with uniform eaves height, a hallmark of the Gründerzeit, or the model of medieval lanes are being rediscovered as capable of providing solutions for contemporary societal constellations. Others continue to support the ideals promoted by modernism, namely the demands for green surroundings, air, light and sun. Regardless of which traditional form is referenced, everyone's hopes are based—as if caught in a kind of a psychological compulsive repetition—on a belief that the reiteration of old patterns may deliver a new valid solution.[11]

11
In psychoanalysis, compulsive repetition is described as an impulse that causes a person to re-enact unresolved and even painful thoughts, actions, dreams, games, scenes or situations again and again in the hope of achieving a "belated mastery", that is, in the hope of effecting a positive outcome.

But as far back as the 1960s planners and residents alike no longer blamed the failure of modern urban ideals on a technical and functional failure of the urban fabric that was part of the charter's criticisms. On the contrary, they blamed it on the new "inhospitality of our cities",[12] which resulted precisely from the lack of human scale caused by the functional separation demanded by CIAM, and which in turn led to an inhospitable, technical atmosphere in many cities.

12
Alexander Mitscherlich, Die Unwirtlichkeit unserer Städte: Anstiftung zum Unfrieden (Suhrkamp: Frankfurt am Main, 1965).

In order to enable sustainable growth for our cities, renewed densification and mixed-use initiatives for existing structures seem inevitable. Restructuring towards densification is underway everywhere—in organically evolved urban structures, on the peripheries, and in agglomerations. These efforts are driven by various causes.

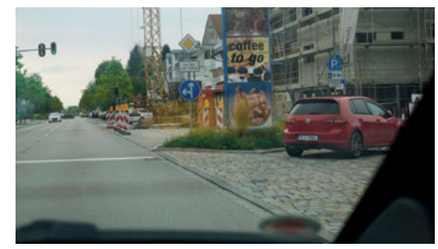
On the one hand are the hard facts: the consumption of land cannot continue unlimited at the ever-increasing pace we have experienced until now.[13] Distances and traffic flows have to be be shortened to

13
Thus the factor of urban permeation (UP) in Switzerland has increased by a factor of 1.5, from 2.75 UP in 1960 to 4.24 in 2002. The annual increase of sprawl is growing rapidly. Between 2002 and 2010, with 0.032 permeation units (in German DSE)/m^2/year, the rise was nearly three times that of the period between 1980 and 2002 at 0.012 DSE/m^2/year. Source: Geomatik Schweiz 3/2007 and 2/2013.

save resources. By placing houses and residential units once again closer together, energetic synergies can be utilized. And the wastelands of (post)modern urban development could be used as available building land for retroactive densification.

On the other hand are the soft factors, which have to be given at least equal weight. These are social coexistence, the city as community, and last but not least the individual experiential value of urban space, a sense of identity and of feeling at home.

But what can densification in these areas truly achieve? And how much densitity translates into the desired goals? For not everyone in contemporary society wishes to live in an environment of compact physical and social density. Density and individualization have a relationship that is fundamentally determined by a phobia. Our liberal lifestyle requires a fitting distance to neighbors to prevent any kind of “social density stress”. The calming effect of green space in a city is a key achievement of modern urban planning and the integration of individuals into the public space are as important as ever and seemingly indispensable to contemporary requirements for work and living.

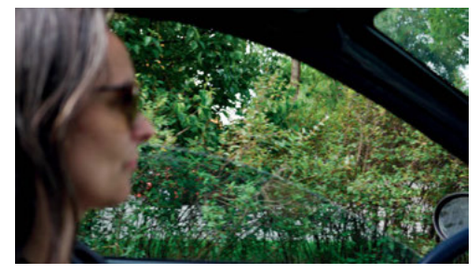


The Right Measure

Currently different approaches are being pursued simultaneously in differing locations and urban situations in Central-European cities. In residential districts and on urban peripheries, planners are searching for a structure that combines the advantage of density with the advantages of a green and spacious city environment. In central locations, experiments are underway using maximum density, optimizing architectural and social attractions in order to create a dense urban atmosphere in the inner cities without going beyond the limits of what the population will tolerate.

To establish the right measure of density for the different locations and social groups, comprehensible foundations need to be created by which to set objectively measurable factors in urban planning in relation to subjective perception.

This book explores the relationships between built density and atmosphere, and presents these relationships in a clear format. A central question looks at the influence of built density on the atmosphere of a city and its districts, and looks at which additional factors must be taken into consideration to deliberately generate a coherent atmosphere. This having been said, it is not a question of arriving at universal magic formulae. Instead an interpretative analysis of the measurable factors is set in relationship to the subjective perception of the urban space. The aim is to create tangible foundations for the comprehensive planning of new urban districts and the retroactive densification of existing structures—foundations that promote an active atmospheric mood in a district and create a dense atmosphere in the urban space that goes beyond the fatalist mentality of “just having to get through it”.



In the Atmosphere of the Street

The focus of this study is on public space. This is where the density of the built environment is spatially palpable. This is where the elements of the city converge in a shared space. This is where communal

urban life takes place. And, finally, this is where the atmosphere of a district or an entire city is created.

The term “atmosphere” is derived from the Greek words *atmós* (which means air, pressure, steam) and *sfaira* (or sphere). It describes the gaseous envelope that surrounds a celestial body, usually consisting of a mix of various gases held in place by the gravitational force of the body. The atmosphere is at its densest at the surface; at greater heights, it transitions fluidly into interplanetary space.

This physical definition has much in common with the other meaning of the term, namely atmosphere as the sensory mood or ambience of a location or a space. We also describe the Earth’s atmosphere in physical terms. And the atmosphere that is discussed in this book could be described as the atmosphere of a site. Similarly to the Earth’s atmosphere, it too is composed of a “mix of various gases”, in this case the differing sensory “emanations” of the space, the objects within it, and of the people and their social actions as a whole. Each object and every person radiates uniquely characteristic sensory impressions, which in turn trigger unique and subjective perceptions in those who discern this mixture. Every object, every house, every tree and every human being has their own appearance, their own expression, scent and sound that feels unique.

This atmosphere is also referred to as an “aura”. The atmosphere of a city is composed of the many different auratic emanations of its individual elements, which, in turn, form what one might call the “atmospheric gaseous mix” of the city and its districts.

Atmosphere is our first—and fastest—perception of a space. An urban space is a highly complex web of many individual components. Nevertheless, we usually absorb it immediately and with all our senses: when we step into the space of a street or square, we form an intuitive impression of its appearance and scale, which triggers a subconscious chain of associations without having consciously grasped every detail. At the same time we hear the width or narrowness of the space, and the composition of its materials, without being able to consciously describe this sound. At the same time, the scent of a space may awaken memories in us, which remind us an entirely different, distant situation. All this occurs in the selfsame initial blink of an eye.

From this mix of sensory perceptions, we develop a sense of the space, which we have difficulty in grasping more precisely and tend to simply speak of as “atmosphere”. However, this preconceived mood will often determine whether we like a room or an individual object, whether we use it intuitively relaxed and feel comfortable in relation to it. All this is based on a sensory code, through which we communicate with the space.

In order to deliberately create an atmosphere, it is therefore of upmost importance to discover how its code functions. To this end, one must analyze and understand the precise composition of the individual elements in order to produce the correct mix of sensory perceptions.

The concept of density plays an important role in this process. As in the context of a planet, it is highest in proximity to the physical mass and diminishes with increasing distance. One could say that a high degree of built density also create a dense atmosphere. However in the subjective meaning of the concept of atmosphere as a sensory mood in a space, atmospheric density is not primarily dependent on

the high concentration of building masses, but on the balanced mix of a multitude of sensory impressions, which create a certain sensory density in the perception of the city. We step into the atmosphere of a street and sense whether we like it or whether there is a discrepancy or dissonance between the space and ourselves.

This book presents an analytical exploration of the relationship between built density and atmosphere to facilitate a new drafting of fundamental principles for the creation of harmonious dense atmospheres in our cities, about which their inhabitants can say:

> “It’s lovely here.”

APPROACH, METHODOLOGY, AND TERMINOLOGY

4 Cities, 36 Urban Districts, 9 Density Categories, 13 Analysis Parameters

The current debate on the necessity of densification and the appropriate degree of density in our settlements always encompasses the question of the gain in quality of life associated with it and the resulting atmosphere. The core question that underlies this book is: what is the specific relationship in an urban district between building density and atmosphere?

The first step toward determining an answer to this question is to define nine density factors and to classify them in nine categories. Within this matrix, 36 districts, or perimeters, in four Central European cities are examined according to 13 analysis parameters, compared, and finally related to the image and the prevailing atmosphere in each perimeter. In this chapter, the key terms are explained and the methodology and approach are described.

Density

The term density is employed in a dual, deliberately ambiguous sense: on the one hand as building density, **to which the nine density categories in this study refer. This is defined as the distribution of the built fabric in relation to a limited urban space.[1] The key value for this density is the floor area ratio.[2]**

The atmospheric density, **on the other hand, signifies the intensity of the sensory perception and the specific mood in the exterior spaces of the selected perimeters in each city. This includes visual, acoustic, tactile, and olfactory stimuli, as well as the total image of the relevant district and how social life in the district is perceived. One could also describe this aspect as the "perceived density".[3]**

The connection **between these two terms is the subject of this book.**

The Density Factors

Building density is calculated on the basis of the floor area ratio (FAR) values; the way this is calculated is not identical in all European cities and countries. Therefore, in this book, it is not calculated in the usual way, from the ratio between the sum of the floor areas of a building and the corresponding private lot area; instead, it takes the entire area of a defined urban perimeter[4] as a reference. The values described as density factors are therefore calculated from the sum of the floor areas of all buildings within the perimeter in relation to the total area of the same perimeter:

$$\frac{\text{Sum of floor areas of all buildings}}{\text{Sum of total area of the urban perimeter}} = \text{density factor}$$

This approach takes into consideration not only the areas of the private lots, but also the area covered by the public street space, squares, and parks, which are all included in the calculation. Thus the resulting density factor provides reliable information on the actual building density in the totality of an urban perimeter. Public space plays a special role in this calculation, since it has a significant impact on the density factor.

The Nine Density Categories

The density categories form the backbone of this study. Based on the density factors, nine density categories are defined. Each density category encompasses a certain range of density factors, determining the degree of density in the assigned perimeters:

Density category 1
density factors of less than **0.4**
Density category 2
density factors from **0.4 — 0.6**
Density category 3
density factors from **0.6 — 0.9**
Density category 4
density factors from **0.9 — 1.2**
Density category 5
density factors from **1.2 — 1.5**
Density category 6
density factors from **1.5 — 1.9**
Density category 7
density factors from **1.9 — 2.3**
Density category 8
density factors from **2.3 — 2.7**
Density category 9
density factors above **2.7**

One perimeter per city was defined as analysis area in each density category.[5] In this manner, one perimeter each from four cities is analyzed per density category. This approach makes it possible to compare different urban planning patterns from different periods and in different contexts, but with similar building density. The relative consistency of the building density within each category makes it possible, in turn, to draw conclusions with regard to the influence of the building density on the atmosphere in the district. Does building density alone determine atmosphere to a large extent? What other factors are similarly influential in this regard?[6]

The Four Cities

To ensure clear comparability, four European cities from German-speaking countries were selected for this study:

Berlin
Munich
Vienna
Zurich

Although these four cities differ considerably in terms of total area and population, they nevertheless share a comparable historic and cultural background, similar settlement structures, and homogeneous lifestyles and demands among the residents.

The 36 Urban Districts

Nine urban perimeters or districts were selected in each of the four cities for the analysis. Each perimeter is a clearly delineated district within the city, and encompasses private land parcels as well as public streets, parks, and squares. Each of these perimeters is assigned to a density category. In the book, the perimeters are therefore identified as follows (density factor in parentheses):

Density category 1
Berlin — Privatstraße **(0.23)**
Munich — Waldstraße **(0.36)**
Vienna — Schippergasse **(0.31)**
Zurich — Im Heimgärtli **(0.30)**

Density category 2
Berlin — Drakestraße **(0.41)**
Munich — Reindlstraße **(0.47)**
Vienna — Pilotengasse **(0.43)**
Zurich — Schlösslistraße **(0.44)**

Density category 3
Berlin — Hochsitzweg **(0.63)**
Munich — Quiddestraße **(0.80)**
Vienna — Larochegasse **(0.70)**
Zurich — Altwiesenstraße **(0.61)**

Density category 4
Berlin — Goebelstraße **(0.93)**
Munich — Konrad-Dreher-Straße **(1.03)**
Vienna — Prinzgasse **(1.01)**
Zurich — Meierwiesenstraße **(1.18)**

Density category 5
Berlin — Senftenberger Ring **(1.44)**
Munich — Holbeinstraße **(1.37)**
Vienna — Ringofenweg **(1.31)**
Zurich — Scheuchzerstraße **(1.28)**

Density category 6
Berlin — Bonner Straße **(1.53)**
Munich — Tumblinerstraße **(1.78)**
Vienna — Hasnerstraße **(1.62)**
Zurich — Bändliweg **(1.55)**

Density category 7
Berlin — Christburger Straße **(2.12)**
Munich — Pariser Platz **(2.02)**
Vienna — Fockygasse **(1.96)**
Zurich — Kanzleistraße **(1.96)**

Density category 8
Berlin — Raabestraße **(2.33)**
Munich — Im Tal **(2.62)**
Vienna — Hahngasse **(2.49)**
Zurich — Spiegelgasse **(2.52)**

Density category 9
Berlin — Friedrichstraße **(3.40)**
Munich — Schwanthalerstraße **(2.89)**
Vienna — Wollzeile **(3.18)**
Zurich — Bahnhofstraße **(2.78)**

The criteria for the selection of the perimeters within each density category are the building density, the comparable total area, a similar siting within the city, and as broad a spectrum of urban development patterns as possible, both within the density category itself and among all the analyzed perimeters being compared.

The 13 Analysis Parameters

In order to determine which factors, in addition to building density, affect the atmosphere, each of the 36 urban perimeters is evaluated according to 13 analysis parameters. These include parameters relating to the buildings and the exterior space, as well as social and historical parameters:

Year of construction **(YC)**
Occupation density (**OD)**
Population turnover **(PT)**
Building height **(H)**
Number of floors **(F)**
Floor area ratio **(FAR)**
Site occupancy index **(SOI)**
Volume-to-area ratio **(VAR)**
Rental price **(RP)**
Undeveloped area **(UA)**
Public space **(PS)**
Use and (public) ground-floor use **(PU)**
Private Space **(PRS)**

On the one hand, these parameters are compared within each density category to draw conclusions as to the character of each category. On the other hand, the analysis of these parameters makes it possible to assess their influence on the atmosphere of the urban perimeters across all density categories.

Precise information on the calculation of each individual parameter is provided at the beginning of the "density catalog", which contains maps representing the key values and an easy-to-follow overview of all analysis parameters in the form of charts.

At the end of the density catalog, all the charts of each city are summarized in a city diagram to provide a clear and comprehensive diagrammatic image of Berlin, Munich, Vienna, and Zurich.

The Atmosphere

In contrast to the objectively measurable 13 analysis parameters, the atmosphere of an urban district is largely determined by the subjective perception of each individual resident or passer-by and their relationship with this environment. But in addition to the highly personal readings, there are universally applicable connections that lead to a perception of atmosphere shared by most people in a specific district. This shared perception depends on certain constellations of a wide range of elements in the urban space. And this book explores these constellations in the exterior space of the various perimeters, with a particular focus on the public spaces.

However, in order to be able to discern the subjective components of the atmosphere, one needs to be present in this environment. One has to be physically there to see, smell, and feel all the ingredients. But a book does not provide that opportunity. For this reason a variety of illustrative means have been employed to convey the atmospheric mood and render it experienceable for the reader, thereby facilitating a comparison of the perimeters in the different cities and density categories:

Standardized District Photographs

The public street spaces and the semi-public exterior spaces were photographically documented in all four cities according to rigorous criteria for comparison: identical height of camera viewpoint, central perspective, same time of day, similar weather conditions. These photographs are shown in the "density catalog" at the beginning of each density category. They provide a clear overview of the exterior spaces in the corresponding perimeters.

Atmospheric Photographs

The photo essay visually captures the atmosphere in the different perimeters. Large-format, full-page photographs reveal the subjective gaze of the photographer, who portrays selected details of the life in the district. These photographs are integrated into the chapter "The Districts" and also feature in the preface and the credits pages of this book.

District Descriptions

Detailed descriptions of the history, location within the city as a whole, current image, streetscape, and atmosphere are provided for each of the 36 urban perimeters from the perspective of the author in order to furnish the reader with as clear an idea as possible of the character of each perimeter. These district descriptions are contained in the chapter "The Districts"; in addition to the data of the analysis parameters, they form the basis for the evaluation and conclusions of this book.

Approach and Methodology

All these data, facts, and descriptions are analyzed and evaluated in order to draw conclusions on the connection between building density and atmosphere. The book is divided into three main sections: "The Density Analysis", "The Density Stories", and "The Density Catalog."

THE DENSITY ANALYSIS

The density analysis contains the textual analysis comprising the district descriptions, the evaluation, and the conclusions. It is organized into three subchapters:

The Districts

To begin with, the basic prerequisites for each density category are briefly explained; next, each of the four perimeters in Berlin, Munich, Vienna, and Zurich are described, followed by a brief interim conclusion on the character of each density category. This creates an overview of all nine density categories and the 36 districts.

Density, Atmosphere, and Numbers

Next, the objective criteria of the relationship between density and atmosphere are explored across all density categories, perimeters, and cities. The material comprising plans, numbers, and data—visually represented in the second section of the book, the "density catalog"—forms the basis for this exploration. Finally, this material is then related to the insights gathered in the district descriptions.

Density and Atmosphere

Based on these insights, comprehensive conclusions arising from the study are drawn, and the key factors for the connection between density and atmosphere are identified. This is rounded out with commentary on the implications of the study, and criteria for future district plans.

THE DENSITY STORIES

In the "Density Stories", four authors share literary narratives on the cities. These four narratives were created specifically for this book and capture the unique character of each author's city from his or her personal perspective: some speak of their hometown, while others portray their chosen hometown. Berlin, Munich, Vienna, and Zurich and their respective atmospheres are thus made "readable", complemented by a brief commentary.

THE DENSITY CATALOG

The Density Catalog presents the collective data material — all the material that can be objectively measured and visualized — arranged according to density category, in the form of photographs, maps, and diagrams. A practical thumb index is a valuable aid in locating information for each category. Thus the relevant data material in the catalogue is readily accessible to complement the reading of the "density analysis". Readers can therefore explore sections of the book separately and according to their own preferences, while at the same time gaining an understanding of how the chapters are linked and relate to each other.

1
See section: "The 36 Urban Districts".
2
See section: "The Density Factors".
3
See section: "The Atmosphere".
4
See section: "The 36 Urban Districts".
5
On the selection criteria, see section: "The 36 Urban Districts".
6
See section: "The 13 Analysis Parameters".

THE DISTRICTS

36 Urban Districts in 9 Density Categories

The character of an urban district is largely determined by its historical origins, the social composition of its inhabitants, its location and use, its current appearance, and much more besides.

Below, the basic conditions of each density category are briefly outlined, each of the respective perimeters from Berlin, Munich, Vienna and Zurich is concisely characterized, and finally some short preliminary conclusions as to the character of the respective density categories are drawn.

DENSITY CATEGORY 1 (< 0.4)

Single-Family House Idyll 1: House and Garden

Zurich, Im Heimgärtli

The Dream of a House of One's Own

The present analysis of districts with a lose development profile on urban peripheries begins with density category 1. People who move to locations such as these are looking for very specific qualities. The houses—most of which are detached, with surrounding gardens—are home to residents seeking a sheltered, intimate and private living environment in close contact with nature.

Historically, the four developments studied here are expansions of traditionally evolved village structures, which arose in the early twentieth century in response to the sudden increase in population numbers and the impact of industrialization, and were consequently incorporated into the adjacent towns and cities. Further densification of the inner cities seemed no longer possible. Regardless of class, families of all income levels were looking for a healthy lifestyle with fresh air, light and sun in a verdant environment. With this in mind, Ebenezer Howard developed the idea of the Garden City toward the end of the nineteenth century. Originating in Great Britain, where the burdens of industrial growth were especially great, and soon spreading across industrialized Central Europe, the Garden-City movement seemed to promise relief for the overstrained city centers. Many cities that built districts based on the English example initially adopted a cooperative model financed by municipal or private funds, yet without aiming to realize Howard's Garden City vision in its entirety.[1]

The verdant urban expansions were instead rather patchy complements to the existing city, and adopted a pragmatic approach. They were either created in areas with favorable landscapes, or on land that allowed for the easy development of inexpensive building sites, or in the vicinity of the new factories on the urban periphery.

Initially, people used the gardens for a home-grown food supply. This aspect was vitally important, especially in the years following the First World War. The regular rows of relatively quickly erected and rather modest post-war homes, with their narrow streets and optimized land use, continue to define many urban peripheries in Central European cities and still transmit the atmosphere of those desperate years into the present day.

With economic recovery, the meaning of property ownership changed from collective uniformity toward taking pleasure in a small territory of one's own, which could be designed with individual flair. Up to the present day, single-family house districts remain the poster images of our individualized society.

What the four districts under analysis have in common is the expansive homogeneity of their urban planning. As new housing settlements, they were conceived on the drawing board to respond to the requirements and ideals of their time and then implemented. Even now, many of these suburban settlements are still barely connected to the adjacent urban areas owing to this structural uniformity. Over the years, this had led to the emergence of an urban patchwork of very different, isolated urban districts, which characterizes suburbs today.

1
Ebenezer Howard's Garden City scheme envisioned founding large new urban developments in the countryside, beyond the boundaries of existing cities. They were to comprise several concentrically arranged belts of new development with a variety of functions (e.g. residential, commercial, cultural amenities), separated by agricultural land. As a new urban utopia, the garden cities were intended to dissolve the contrast between city and countryside and make it possible for cities to grow and expand in a healthy fashion. Although no Garden City was ever fully realized, the idea served as inspiration for the urban-planning ambitions of modernism and their subsequent implementation on a large scale after the Second World War.

The Perimeter

The district centered on Waldstraße in Munich-Trudering **(density factor 0.36)** is a residential area that has gone through all these development stages. During the years of severe housing shortages toward the end of the First World War, the so-called Gartenstadt

(garden city) was created in the Munich suburb of Trudering, which includes the area around Waldstraße and was incorporated (into Munich) in 1932. After the Second World War, the once needy population strata, with their vegetable gardens grown for self-sufficiency, gradually made way for more affluent middle-class residents, who appreciated the tranquil and family-oriented lifestyle in green surroundings with easy access to the city. Since the closure of the old airport and the completion of a subway line to the new Messestadt Riem district (lit. Convention City Riem) in 1999, population numbers have increased sharply. Today, the Gartenstadt in Trudering is one of Munich's most popular residential districts.

This successive development is clearly visible in the design of the individual houses. In the grid of quiet residential streets encompassing blocks of different sizes, simple buildings with hip roofs from the early years of the settlement alternate with semi-detached homes from the 1950s and two-family houses from the 1970s designed in the vernacular of the Bavarian alpine foothills, and contrasting with renovated 1960s bungalows. In between, building cranes tower skyward from newly excavated construction pits right alongside postmodern single-family homes.

A close look at the figure ground plans of the four districts reveals that Trudering boasts the largest open spaces while at the same time possessing the greatest building density. This is the result of a deliberate concentration of the building mass in mainly two-story detached and semi-detached homes along the edges of unusually deep lots. Consequently, the centers of the blocks have a very generous, visually continuous garden space.[2] From the very beginning, a second building line was introduced in this area, and is mostly occupied by small garden sheds or gazebos, as well as a few residential homes accessible via footpaths. In the near future, this potential building space could be utilized more intensively at the expense of the gardens, as is already happening in the eastern part of the district. If this were the case, the density factor would increase significantly.

The urbanization of the district is also reflected in the concentration of public space. On the one hand, at barely 12.5 percent, the share of public spaces in relation to the gross area within the perimeter is lowest among the four districts analyzed here. On the other hand, it is notable when looking at the larger context of the garden city that small-scale and larger parks are dispersed across the district; public spaces are thus combined to form open spaces for communal use, very much in the vein of urban squares. They create focal points in an otherwise uniform residential district, where the streets are interchangeably similar despite the difference in house styles.[3]

The proximity to the urban core is also revealed in the great number of cars parked in the relatively wide streets with sidewalks on both sides. Moreover, the dynamic district boasts the highest fluctuation rate of all perimeters under discussion.

At first glance the Schippergasse in Vienna-Großjedlersdorf **(density factor 0.31)** offers a very similar streetscape. However, this district provides a more tranquil environment than that in Munich. The houses are slightly lower in height, the streets somewhat more verdant, and the residents display the highest residential stability of the four districts. Even so, in the figure ground plan the development in this district reveals the highest density, confirmed by the high site occupancy index of 0.19. With a floor area ratio of 0.31, the

2
A similar urban-planning solution with greater density (larger houses on smaller lots) may be found in the Lichterfelde residential district. Compare the Drakestraße perimeter, density category 2.

3
If this type of green space, for example the area along Waldstraße, were to be included in the perimeter discussed here, the percentage of public space would be much higher.

Berlin, Privatstraße
Munich, Waldstraße


PAPIERTONNE
MÜNCHEN
Papier-Tonne

utilization of available development space is well below that seen in Munich. This more modest ambiance of the district is rooted in its origins, which are closely linked to the industrialization of the region.

Like Trudering, Jedlersdorf was once a small village in the floodplains of the Danube outside of the city gates of Vienna. From 1872 onward, the construction of the Northwestern Railway (a former railway company during the Austro-Hungarian Empire) gave rise to the emergence of many industries in addition to the large railway factory. Following incorporation into Vienna as the city's 21st district at the beginning of the twentieth century, there was a steady influx of large working class families, necessitating the creation of a variety of factory and workers' housing settlements. Among these is the Schotterfeld workers' settlement, which was founded in the late 1920s. Rapid industrial development has left its mark on Großjedlersdorf to the present. Today, the bourgeois idyll of the district is surrounded by a hodgepodge of large-scale developments on the boundary to the open landscape.[4]

4
Compare the districts Pilotengasse (density category 2) and Prinzgasse (density category 4) in a similar setting in the Donaustadt, Vienna.

Once again, the individual houses reveal their year of construction; the overall urban structure, however, is noticeably more homogeneous. The older streets are narrow with unpaved sidewalks, while the newer ones are more generous in scale with paved sidewalks on both sides and, in some case, rows of trees that separate the sidewalks from the road. The streets surround narrow neighborhood blocks, which are nearly equal in size and reflect the former division of agricultural fields. Although this area has the highest ratio of public spaces—nearly 16 percent—among the four districts analyzed here, there are no parks at all. The street is the only space available for communal use, but as it fails to provide a hospitable environment, it tends to remain empty. Daily life plays out within the confines of the private homes and gardens. This great emphasis on privacy is also evident in the occupancy rate, which documents that each resident of the Schippergasse occupies an average of just under 119 square meters floor space.

The settlement Im Heimgärtli in Zurich-Albisrieden **(density factor 0.30)** shows an even more homogeneous image. In contrast to the other three districts, it was built in 1933 as a simple workers' settlement with gardens for cultivating fruits and vegetables for self-sufficiency. To this day, it still looks as if it were cast from a single mold.

The Heimgärtli is also located in a former suburb, which was incorporated into the City of Zurich in 1934 in the wake of industrial development. Since Albisrieden is shadowed by the Uetliberg (a small mountain overlooking the city) in the afternoons, it was never one of Zurich's preferred residential areas despite its proximity to nature. The entire foot of the mountain slope was therefore gradually built over by building cooperatives with simple row housing and smaller detached homes. It is only very recently that some of these settlements are being expanded with new buildings on a larger scale.

The building structure of the Heimgärtli district is extremely simple and space saving. The relatively small area was divided into identical building lots. "Im Heimgärtli", the eponymous street, is a quiet cul-de-sac that forms the central axis of the district. Identical small two-story houses with saddle roofs are centered along this axis of the site. As a result, the individual buildings are separated by green zones, but the private garden space has shrunk to a narrow strip around the house. However, this narrow strip is so intensively utilized that many of the modest homes are nearly obscured by vegetation today. The two blocks at the core were even developed with three rows

each to maximize the land use. Of these, the center row is accessed via small dead-end access lanes.

Although individual houses have gradually been adapted to changed living requirements over the course of time, the serial row layout has been preserved since larger additions are impossible due to a lack of building space on each lot.
As is the case in Vienna, there is a great degree of identification with the district and hence considerable stability with regard to long-term residency. At 14 percent, the ratio of public space still falls within the average range of the density category 1; however, in this case it is exclusively concentrated on the narrow network of paths through the settlement, without creating any visible focal points. The modest width of the streets, which have no sidewalks, creates close proximity between neighbors and generates an intimate sense of community among them.

In contrast to the rather repetitive and extensive urban configurations in Munich, Vienna and Zurich, the district Privatstraße in Berlin-Hohenschönhausen **(density factor 0.23)** is characterized by an idiosyncratic, rigorous structure.

Hohenschönhausen, a former one-street village in Brandenburg that was incorporated into Greater Berlin in 1920, was renowned as a small rural oasis thanks to the small lakes that surround it. When industry moved into the area, population numbers soared and new developments sprang up, branching out in sections from the historic core of the village. On one of the northern pie-shaped sections of this expansion, a single-family house development was created on a privately owned site from 1936 onward. The structure of this development, whose systematically numbered streets are still simply named as a “Privatstraße” or “private street”, is radially aligned with the old village center. The curved side streets, lacking in sidewalks, are relatively narrow; their unpaved edges emanate a rural atmosphere. At a small green space, which forms the center of the district, a wide principal axis with green verges and pedestrian paths intersects with an expanded crossroad. Surrounded by modest residential areas, large-scale prefab housing estates and allotments, the settlement seems introverted and insular—sealed off from the outside.

The narrow lots are roughly equal in size. Small houses from all stages of the development are situated close to the road, their gardens to the rear forming a communally sheltered green space in each block—much the same as in the district in Munich—within which a variety of small structures have been erected as well as a notable number of small pools.

This settlement has by far the lowest building density of all the districts analyzed in this chapter. The distance between structures, the intensive use of the gardens and the proximity between neighboring blocks almost gives the district an air of an allotment colony. This modesty is also evident in the occupancy index of 68 square meters of floor space per resident. Although the central green space and the two wide axes offer generous public spaces, daily life remains focused on the lovingly maintained homes and gardens.

Private Sphere and Communal Sphere

The areas analyzed for density category 1 are purely residential areas where active use is focused in the private sphere. Generally speaking, the street serves only as a traffic route and connection to the city,


2