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Tobias Just
Franziska Plößl *Editors*

European Cities After COVID-19

Strategies for Resilient Cities and Real Estate

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Editors
Tobias Just
IRE|BS International Real Estate
Business School
University of Regensburg
Regensburg, Germany

Franziska Plößl
IRE|BS International Real Estate
Business School
University of Regensburg
Regensburg, Germany

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Preface

Real estate is built for decades, cities for centuries. That is why urban development processes usually take a very long time, with intricate regulations not allowing for quick adjustments. But sometimes there are upheavals, sudden changes in the key factors, leading to an acceleration of the inner-city adjustment processes. In the past, these have often been natural disasters, wars or infectious diseases.

The COVID-19 pandemic, which has affected our lives since the beginning of 2020 with massive health risks and severe restrictions to our daily and professional lives, might represent such a juncture. The daily routines of millions of people have changed significantly, establishing new routines and habits. Where new technologies might have provided access to everyday communication, professional collaboration or primary needs but had been avoided out of convenience or fear, during the lockdown periods old path dependencies were re-examined. Video conferences, e-commerce or VPN clients for teleworking were already in place before the pandemic. But the need in 2020 and 2021 has intensified their use and created experiences that—where positive—would no longer be reversible.

Since the use of real estate is shaped by our everyday, leisure and professional lives, and because our lives are partly determined by very specific properties, the question of how the pandemic will change urban life and how the use of buildings and the appearance of cities will adapt was quickly raised. At the same time, the question arises as to which institutional or technical changes could reduce the risk of future pandemics and what role real estate will play in this process. The fact that, in the middle of 2021, it is still too early for conclusive answers to such far-reaching questions has been obvious since the beginning of this research project. However, local politicians, stakeholders in the real estate industry and ultimately each individual household cannot delay many decisions until all the relevant information is available. In this respect, the editors and the client of this book have been aware that the search for answers is a journey which should be undertaken as a large group. In this way, many different perspectives in a situation that is still characterised by a high level of uncertainty can, like pieces in a puzzle, contribute to a clearer picture.

In this book, we want to provide readers with a variety of perspectives from which to view the potential effects of the pandemic on European cities and their buildings. Together with the Product Councils of ULI Germany, a comprehensive questionnaire was prepared in German and English and was completed by a total of

421 respondents in March and April 2021. The assessments were supplemented by seven interviews with practitioners from the real estate industry. In parallel, a review was made of the literature by students of the University of Regensburg as part of a master's seminar in order to obtain further assessments from academic and practitioner researchers. In view of the complexity and the degree of uncertainty, both the client and editors agreed that the most comprehensive and independent expertise possible was needed on specific topics. Therefore, analysis of the survey and interviews was extended with ten contributions from researchers in economics, urban planning, architecture, engineering and work organisation from Europe, the USA and China. This required tight project coordination, close collaboration between client and editors and a high degree of discipline on the part of all contributors in order to complete this project within such a narrow timeframe.

We would like to thank the authors for their insightful contributions as well as the respondents for the extensive participation in the survey and for the meetings with the ULI Product Councils that preceded it. We would also like to thank our IRE|BS students, who worked with great dedication on the various topics, and particularly Ann-Kathrin Heinemann for her support in finalising the book. Finally, we would like to thank our project partners at ULI, especially Stephanie Baden, Sabine Georgi, Julia Heun and Michael Müller, for their enthusiastic cooperation. We would also like to thank the companies whose financial and content-related support made this project possible in the first place (ABG Real Estate Holding GmbH & Co. KG, Allianz Real Estate GmbH, Berlin Hyp AG, Deutsche Wohnen SE, Greenberg Traurig Germany LLP, Kaufland Dienstleistung GmbH & Co. KG and Palmira Capital Partners GmbH).

We hope that this book will help shape the discussion about the future design of cities in Europe and that the ideas, conclusions and analyses pooled together here will contribute to creating European cities that are more liveable and healthier after the pandemic, but no less economically efficient than before. In this respect, such a juncture also offers the chance to break outdated path dependencies. However, we do not want to jump to conclusions in the foreword and hope that you will enjoy reading this book and that it will provide you with some exciting insights.

Regensburg, Germany

Tobias Just
Franziska Plößl

Preface

Nothing is more constant than change—but what exactly is currently changing and where? As an organisation at the interface between urban, neighbourhood and construction planning, we see our task as being that of taking a closer look when change happens faster than expected—as if under a burning glass. The COVID-19 pandemic is now seen as an accelerator in many areas of the economy and research: processes that had already begun are now taking place much faster than before. There is a high level of uncertainty among market participants—discussion ranges from the view that offices are no longer needed at all, that everyone wants to go to the countryside or that co-living and co-working have no more reason to exist because of the high risk of infection to the perspective that nothing much will change because Europe is heterogeneous and, partly due to the predominance of small and medium-sized companies there, is resistant to crises. But there is also some support for the implementation of innovations. We were interested to find out more about what needs to be done to ensure that our cities will still be attractive tomorrow, and what should be preserved? Are city centres dying or do they offer new opportunities? Will cities lose their attractiveness? What is the effect of density and how should planning and building laws be further developed in order to be able to shape the transformation? All these questions are addressed and scientifically prepared in this book.

We would therefore like to thank IRE|BS—especially Franziska Plößl and Tobias Just—for undertaking the study, for conceptualising, implementing and analysing the large-scale survey and for coordinating the expert contributions, in short for putting together this pioneering book, which shall stimulate further discussions with the industry, with city representatives and finally with the urban community. Without the generous support as well as the content-related contributions of our partners ABG Real Estate Holding GmbH & Co. KG, Allianz Real Estate GmbH, Berlin Hyp AG, Deutsche Wohnen SE, Greenberg Traurig Germany LLP, Kaufland Dienstleistung GmbH & Co. KG and Palmira Capital Partners GmbH, neither this project would have been possible nor the opportunity for further discussions with colleagues in and outside Europe.

We have prepared the questionnaires with the help of the ULI Product Councils, and we look forward to evaluating and applying the results in addressing the task of transforming our cities—#bettertogether.

Frankfurt am Main, Germany — Sabine Georgi

Contents

Part I

Strategies for Resilient Cities and Real Estate

Challenges for European Cities After the COVID-19 Pandemic

Tobias Just and Franziska Plößl

Abstract

This chapter explains urban functions and their shifts in course of the COVID-19 pandemic. Such shifts in functions already occurred in past epidemics (or other shocks) and led to significant adaptations of urban structures. From a Europe-wide survey of real estate professionals, it can be deduced that the pandemic is more likely to result in centrifugal forces than in further densification in the big cities due to expected higher demand for residential spaces. Challenges for cities include, among other things, the redesign of public spaces and the conversion of existing properties as well as the reconstruction of transport infrastructures necessary for the restructuring, i.e. strengthening, of districts; this requires closer cooperation between private and public stakeholders. For actors on the real estate market, an assessment of the different burdens and opportunities of adjustment for individual asset classes is sketched.

1 Introduction

Cities have existed for millennia. In many sources, Jericho is named as the oldest city in the world with 10–12,000 years of age. This is debatable because a Neolithic settlement did not provide the functions that we associate with cities in later millennia. In fact, these were early settlements with only a few hundred inhabitants that later grew into cities. This growth first took place in the region known as the "Fertile Crescent"; a region that stretches from the Persian Gulf in a crescent-shaped

T. Just · F. Plößl (✉)
IRE|BS International Real Estate Business School, University of Regensburg, Regensburg, Germany
e-mail: tobias.just@irebs.de; franziska.ploessl@irebs.de

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arch above the Syrian Desert, down to today's Lebanon, Israel, Palestine and Jordan. The south-east of today's Turkey should also be considered as the cradle of early cities.

Cities grew rapidly as their advantages drew increasing crowds: 6000 years ago, Uruk—sitting in current Iraq—had 5000 inhabitants. The city of Ur, also in what is now Iraq, had 100,000 people 2000 years later. Around the birth of Christ, both Alexandria in today's Egypt and Rome are said to have been the first cities to reach the one million people mark. The Chinese cities of Kaifeng and Hangzhou were among the historic metropolises around a 1000 years later. But the focus on these few giant cities does not capture the general trend of the global development: fast-growing cities also emerged in North, Central and South America as well as in Africa. In Europe, cities experienced their renewed strength with the Renaissance: they became the economic—and thus also political—power hubs in Europe.

But the quantitative urbanisation process only experienced its real acceleration during industrialisation and the strong population growth in the last 200 years—first in Europe and later in all parts of the world. Around the 1800s, in fact, no more than 7% of the world's population lived in cities. In Italy it was already 14% at that time, while England showed a solid 20%. Just a 100 years later, 16% of the world's population lived in cities; in England and Wales, it was almost two out of three persons (see Fig. 1). At the turn of the century, almost 30% of the inhabitants of the German Empire were designated as urban populations. The industrialisation of Germany started comparatively late, but was then characterised by great intensity. In turn, this led to a rapid increase in the urbanisation rate of over 20 percentage points within 100 years. In the post-war decades in Japan and in the past four decades in China, developments were even twice as fast as in Germany in the nineteenth century. In Western Europe, the urbanisation process only slowed down in the second half of the twentieth century (Chandler, 1987; Chandler et al., 1974; Galka, 2016; Modelski, 2003; Morris, 2011).

For the year 2007, the statistics of the UN Population Division (2021) show for the first time ever that more people lived in cities than in rural areas. Burdett and Sudjic (2007) speak of "the endless city" and thus summarise the results of a conference series that toured through the world's metropolises under the brand "Urban Age". Glaeser (2011) speaks of the "triumph of the city" and characterises cities in the subtitle of his book as the "greatest invention of mankind".

According to current forecasts, this development will continue in the coming decades. For the year 2050, the UN Population Division expects that almost 70% of humanity will live in cities. This would be a further 2.3 billion increase in the number of people living in cities, given the continued global population growth. Even in Western Europe, for which the UN Population Division expects a slight decline of the total population by 2050, an increase in the urbanisation rate would increase

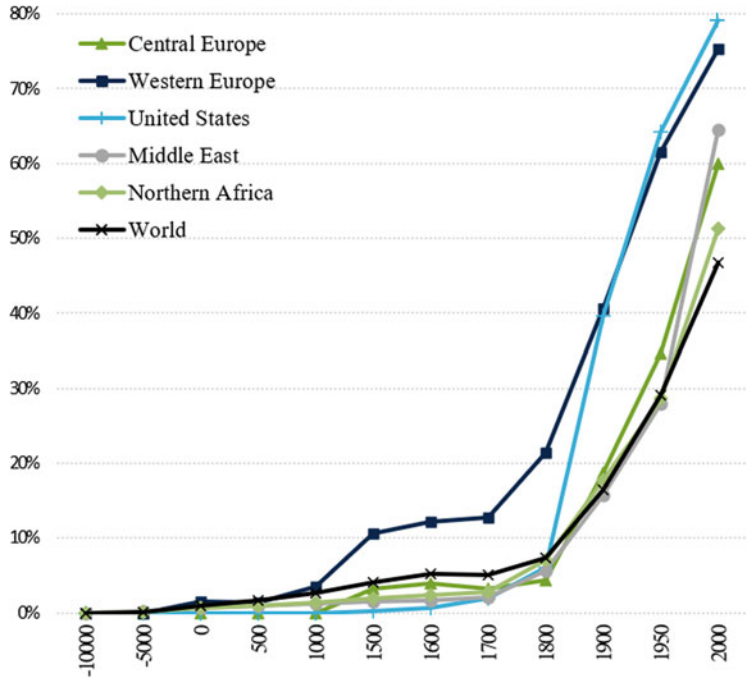

Fig. 1 Urbanisation over the past 12,000 years. Source: Ritchie and Roser (2019)

the number of people in cities by a further 7 percentage points (to 87%) by 14 million.[1]

However, these projections for the further urbanisation process could not factor in the pandemic. The question arises as to whether the pandemic could mark a turning point in this process, both in terms of quantitative urban growth and qualitative changes within cities. So the authors in this book seek answers to the following questions: first, will the urbanisation process slow down? Second, is there a shift in focus between the uses and functions of cities? Third, how could private sector and political actors shape these changes to reduce the adaptation burden and prepare for future pandemics while creating more liveable cities? Fourth, what implications do these dynamics have for real estate market actors and our built environment?

[1] This information is based on the middle variant of the UN Population Division. According to the division of the UN, Western Europe consists of the states Austria, Belgium, France, Germany, Liechtenstein, Luxembourg, Monaco, the Netherlands and Switzerland.

2 Approach of This Study

None of these questions can be answered conclusively, because the further course of the pandemic is still uncertain (as of summer 2021). Accordingly, the authors approach the answers in this book from different angles: on the one hand, a survey was carried out among European property market professionals from March to April 2021. The 51-question survey was answered by 421 participants in German or English. Participants did not have to answer all questions, but could select the fields for which they could provide the most qualified answers.[2] Most of the participants come from German-speaking countries, and most are between 40 and 60 years old (59.23%). Half of all respondents live in core cities and 66.59% work there. One fifth of those surveyed work in the real estate investment sector and another fifth do as developers, architects or urban planners.

Secondly, researchers from the fields of urban planning, architecture, regional and real estate economics, transport science and work organisation theory were asked for their assessments on individual subject areas. Furthermore, students at the University of Regensburg did preparatory work in a literature seminar to receive further assessments from researchers. Thirdly, real estate professionals show their view of market developments and possible need for action through interviews.

With this approach, numerous aspects can be examined from different perspectives. Even if the plurality of perspectives sometimes shows the complexity and uncertainty of the current situation, it also enables reliable future prospects precisely where analysts from different angles came to a similar conclusion. The uncertainty can definitely be assessed as a first result of the investigation. After all, a high degree of uncertainty obviously calls for additional flexibility from stakeholders and institutions.

3 Urban Functions

To properly analyse possible functional shifts of cities during the pandemic, it is worth understanding why cities have become such a success story in earlier millennia. Obviously, the advantages of the greater population density in urban areas outweigh the disadvantages (Ahlfeldt & Pietrostefani, 2019).[3]

Ultimately, the advantages of cities can be attributed to three economic principles/effects: first, cities enable *economies of scale*. Important public goods such as security, some administrative services, line-bound infrastructure, cultural

[2] The question set on the residential asset class was answered by 64.61% of participants, on offices by 63.90%, on retail by 42.76%, on logistics by 25.89% and on hotels by 17.10%. Participants could choose several question sets.

[3] It is unfeasible to encompass the extensive literature on the pros and cons of cities in such a short introductory chapter. Interested readers will find valuable information in Quigley (1998), Glaeser (1998), Glaeser (2011) and Ahlfeldt and Pietrostefani (2019).

goods or training and research can be offered more easily and cost-efficiently in denser spaces than in sprawled structures.

City walls have provided effective and efficient protection for centuries, and people can be supplied at significantly lower costs per capita for traffic or cable-based infrastructure than in the countryside. Opera houses and theatres, for example, are often economically deficient, but this deficit would be even greater without a large catchment area for potential visitors. Cities also offer economies of scale for goods provided purely by the private sector, both in production through better access to labour and capital, and in consumption, e.g., because they allow a richer gastronomic or cultural offer. Vendors can specialise more and benefit from the division of labour. In village communities, there may be only one person who is familiar with any legal issue; in large cities, however, there are experts for every sub-segment of public and private law. The same applies to almost every commercial and service activity.

Second, cities enable low *transaction costs*. For centuries, markets and trade fairs were central and physical meeting places for people to exchange goods, services and information. The more people got together, the more intense this exchange and competition between providers became. And if a company is looking for employees with specific skills, it is more likely to find them in a large city than in village communities. Higher competition not only forces lower prices in the short-term, but also boosts the development of new products and processes.

Thus, production costs for a large number of private and public goods are lower in cities than in the countryside. The third and most important long-term key factor for the success of cities is likely to be positive *external effects* that are not offset through market prices, but rather lead to unexpected new ideas and products. A theatre piece may initially entertain, and the visitors pay their fee for this. But event attendees may draw inspiration for a book, a piece of music or a new product: human creativity is strengthened through interaction and networking, provides inventions, innovations, i.e. new products and better processes. It is the many inspirations, encounters and perspectives in a city that enable innovation potential beyond the size that can be controlled within the company. Increased creativity not only favours productivity and thus enables higher incomes, but also creates amenities that one can afford with these higher incomes: art, culture and experiences. And these amenities also attract people (Brueckner et al., 1999; Schäfer & Just, 2018). Johnson (2010) illustrates this in his matrix of important innovations of the past 600 years. In the fifteenth and sixteenth centuries, most inventions and innovations were created by individuals (mostly in non-market environments). Inventions as a joint network effort did exist back then—and individual inventions would probably not have been possible without the multiple inspirations in cities—but they were more the exception than the rule. This changed increasingly in the following centuries. Today, network inventions and services that only arise as a group service are the rule. Johnson names, among other things, the computer, the work on climate models or nuclear research. This is due to the necessary division of labour enforced by the complexity of the endeavour, higher capital requirements and the necessary speed to beat potential competitors today.

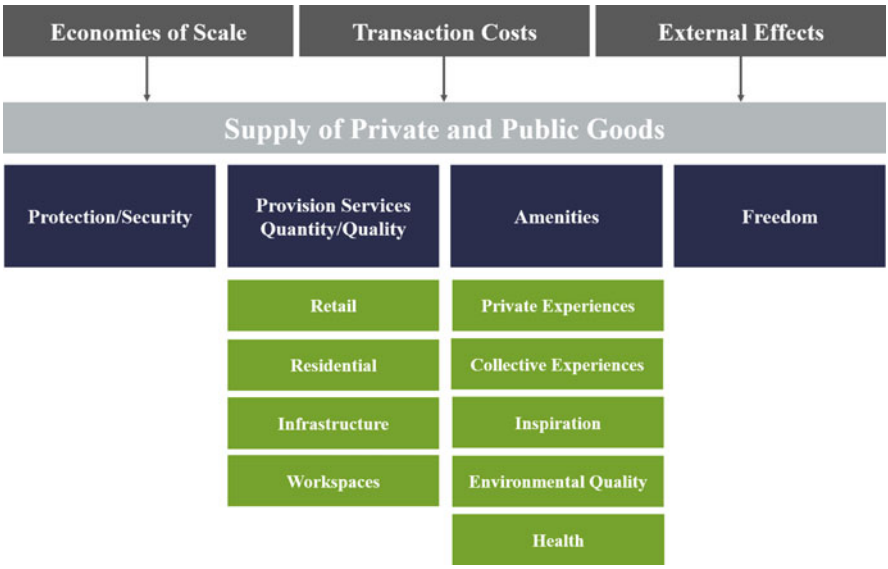

Fig. 2 Supply advantages in cities (pre-COVID-19). Source: Own illustration based on Glaeser (1998) and Quigley (1998)

For these external effects to have a meaningful impact, a high degree of freedom is necessary: freedom of expression and free movement of goods, capital, services and people, etc. According to the dictum of Acemoglu and Robinson (2019), such freedoms can possibly be guaranteed more easily in cities than at the (national) state level. Accordingly, city dwellers may stay more easily within the narrow success corridor between the forces of a strong state and the forces of social values and prejudices, i.e. what Acemoglu and Robinson call the "force of society". This is ideally expressed in the German phrase "Stadtluft macht frei" (city air makes you free). Within this narrow corridor, free actors can then create a tailor-made bundle of public goods of the "bound Leviathan" and private goods of a free society.

These considerations can be summarised in Fig. 2 to form four main advantages offered by cities for the supply of public and private goods.[4]

In early cities, the focus was on *protection*, especially physical protection from the use of external force. Initial *provision services* in cities and *amenities*, such as shared experiences in ritual activities, created further advantages. Economic advantages such as marketplaces and trade fairs quickly arose and led in turn to craft and later industrial specialisation. If a (relatively) high degree of *freedom* could

[4]To do this, we broke through the strict logic of economic goods categories as to better illustrate possible implications for real estate markets later. Ultimately, all the boxes outlined can be traced back to the three economic effects of economies of scale, reduced transaction costs and (positive) external effects, and protection/security and freedom could also be grouped into the types of private and public goods or assigned to either production or consumption purpose.

be guaranteed, this increased further economic advantages via the network effects, and this attracted further talents from outside.

The pandemic changed—at least temporarily—the framework conditions in each of the four main fields (protection/security, provision services, amenities and freedom) and also in the relationships between the fields below. Many people experienced lockdown phases with the associated mobility restrictions as a serious insecurity and a massive restriction of freedom; ultimately, social interactions and the amenities in cities were considerably restricted. In particular, urban areas intended for retail and leisure showed a massive decline in movements (see chapter "Consumer Cities Under Pressure to Change"—Just & Plößl, 2021). Shared experiences were kept to a minimum, either voluntarily or enforced by State power. Entire sectors were unable to offer their services or only offered very sparingly (hotels and restaurants, hairdressers, artists, event companies, etc.); information exchange became considerably harder and, in many cases, there were significant disruptions to value chains (see chapter "The Preservation of Economic Structures as a Main Challenge of Urban Development"—Oberst, 2021).

4 Experiences with Epidemics and Pandemics

The meaning of the individual fields and relationships between fields of cities (see Fig. 2) has been repeatedly changed over the centuries. Epidemics (e.g. the plague or cholera) repeatedly afflicted urban residents and triggered urban responses to these shocks. Ultimately, the shock increased the costs of population density. These typically include noise and dirt, long traffic routes, crime and health problems. In pandemics, the last point is given considerable weight and can dominate all advantages if there is not an appropriate response by city officials (see chapter "Lessons from the Cholera in Paris and Hamburg"—Plößl & Just, 2021). Reactions to pandemics changed urban structures while buildings and neighbourhoods received major upgrades. If this succeeded appropriately, rent and price reactions remained under control. However, failure to take adequate adaptation measures could extend the epidemics' effects for decades.

Francke and Korevaar (2021) calculated only slight decreases in purchase and rental prices (plague in Amsterdam and cholera in Paris) for the year of an outbreak, especially in the medium to long term, when the epidemics led to extensive renovation programmes, including for residential buildings and infrastructure, and when many people from the outskirts could move to the city. In the following years, such adjustments saw a gradual price recovery but also the onset of displacement effects. In a city like Hamburg before the cholera epidemic of the nineteenth century, most residents lived in the inner city. After urban redevelopment programmes and the associated upgrading, however, it was largely working-class families who were pushed out into the outskirts, and there was more commercial real estate uses in central locations. Other developments were evident, for example, with the cholera outbreak in London, which led to persistently low prices in some areas (Ambrus et al., 2020). This could be attributed to the inadequate urban planning measures.

Ultimately, the connection between urban planning, hygiene and epidemiology was recognised in earlier infectious diseases.

However, good answers of the past do not need to provide suitable answers to the current situation. On the one hand, the transmission routes of COVID-19 and, for example, cholera differ, and on the other hand, city dwellers today benefit from the improvement measures introduced in earlier centuries. Wang and Zhou (2021, chapter "Urban Form, Neighbourhood Governance, and Real Estate Management: Chinese Cities Fighting a Pandemic") show, based on the strategies of Chinese cities since the outbreak of the COVID-19 pandemic, which organisational and technological measures have been taken in China: enclosed residential communities facilitate the curbing of the virus; the urban governance structure of local neighbourhoods forms a spatially and institutionally unique system, and the increasing privatisation of property management combined with the use of a recent tech-enabled tracking system is slowing the spread of diseases. Even if some of these measures cannot reasonably be implemented in European cities, the logic of technological tracking paired with small-scale administrative structures can be transferred.

5 Urban Development After COVID-19

Cities often changed their structures after armed conflicts, natural disasters or illnesses. Compared to the turning points of earlier centuries, the pandemic represents a minor disruption to the freedoms and lifestyles of people in Europe. Despite the sometimes draconian, freedom-restricting measures in 2020 and 2021, the overall mortality risk was low, the development of income and asset positions in most households was more favourable than in previous crises, as was the willingness and ability of state institutions to sufficiently dampen the effect on the population. Carozzi et al. (2021, chapter "Density and the Spread of COVID-19 in Cities: Lessons from the United States and the United Kingdom") show in their article that mortality risks during the COVID-19 pandemic were only higher in cities than in rural areas during the first wave. The analysis referred to intensities for a set of local authorities in the United Kingdom and counties in the United States. Also in Germany, urban districts' mortality rates were not higher than those of rural districts. But this level of analysis may be a tad too rough: if you go down to the neighbourhood level, you are able to find indications that the infection risk during the pandemic correlates with higher density (Endt et al., 2021). In particular, low-income households in cramped conditions seemed to have been more exposed to the infection than households that live in districts with a relatively lower building density. If the displacement follows the infection process, low-income households in particular would (once again) be pushed out to the urban outskirts, where there is slightly more space and better access to green spaces available for a limited household budget.

The more the density advantages of a city were reduced in the wake of the pandemic, the more pronounced the outflow from the cities could be. Ahlfeldt and Pietrostefanie (2021, chapter "Revisiting the Economic Effects of Density in the

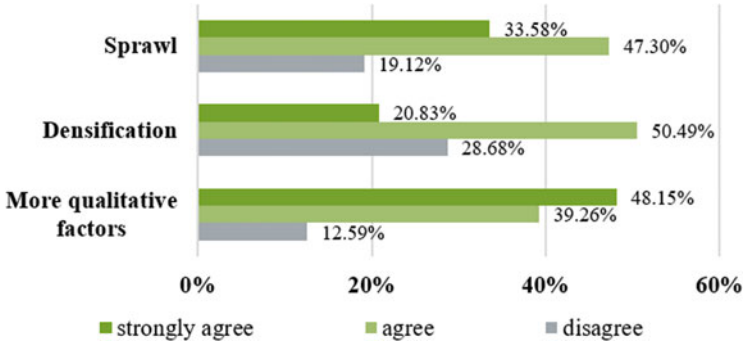

Fig. 3 Cities will grow outwards more strongly than before. Notes: Own data collection to assess the statements: "After the pandemic, cities will grow outward more strongly than before", "After the pandemic, cities will grow more strongly than before through densification". And also: "In the next few years after the pandemic, the focus will be more on qualitative and less about quantitative area factors"; 3.89%/3.89%/3.80% of all participants did not provide any information

Wake of the COVID-19 Pandemic") model the possible effects using an extreme constellation where all urban density benefits disappear. The consequence would be a long-term sharp decline in the gross domestic product of large cities, and a strong population shift from larger to smaller cities. But because density advantages, i.e. productivity, will also disappear in smaller cities, urban population will grow but economic output will stall. Output would also decrease in smaller cities, but to a much lesser extent compared to the big cities. This hypothetical model calculation is of course not a prognosis, but it does illustrate the direction in which socio-demographic and economic shifts are acting if density benefits erode.

Future urban planning will have to endeavour to use a city's functional bundle (see Fig. 2) and design a new mix, so that dwindling advantages and growing disadvantages are offset by newly created benefits. It is, therefore, unlikely that urban structures will remain unchanged after the exceptional pandemic situation. According to the assessments of experts speaking in this book and the real estate professionals surveyed, this has less to do with the direct adjustments to the pandemic shock than with the acceleration of processes which were already recognisable before the pandemic (as with earlier epidemics). This is an interaction between social and technological processes. In the future, things that were already technically possible but insufficiently tested—and thus failed due to acceptance problems—will be implemented more regularly. This can then affect the way people work, live and consume; new habits could consolidate and thus require new urban and real estate structures.

In the survey, more respondents expected cities to grow somewhat more outwardly and redensification to remain important at the same time. And yet, the whole pressure to change that arises—as in Hamburg and Paris during the cholera epidemics—from higher (residential) demand cannot be compensated by redensification alone (see Fig. 3).

In connection to the question of where this additional demand can be met there is the assessment of surveyed property professionals and several authors, who suggest that qualitative changes prevail over quantitative ones. Weidner (2021, chapter "Urban Planning Aspects of the Resilient City") shows, for example, that in the case of inner-city properties there should be more mixed-use, both horizontally and vertically. By converting properties to meet new needs, the district approach also arises within buildings. The increase in buildings can serve as an incentive for private owners to transform formerly profitable areas (e.g. international retail chains) into now less profitable, but resilient ones (e.g. handicrafts). Hammerschmidt (2021, chapter "The Health Equity Imperative and the Role of the Built Environment") stresses that public areas should be redesigned to allow for more physical activity, leisure and recreation, social connectivity and economic prosperity. It is, therefore, a matter of redistributing inner-city space towards more leisure and recreational purposes. Jarass et al. (2021, chapter "How COVID-19 Is Changing Mobility Behaviour and What that Means for Sustainable Urban Transport") show how this leads to more active mobility among city dwellers. Since there was an increase in (motorised) private transport during the pandemic and because this—if indeed a persistent effect—would mean a major conflict with climate policy goals, a significant reduction in average inner-city distances would have to be initiated. This is most likely to be achieved by breaking up existing urban structures that assign individual functions and uses to urban districts and enable a development towards a network of quasi-self-sufficient districts in which a large part of the traffic lies within them (e.g. by bicycle). This, however, must not only apply to a few selected districts but to as many of them as possible so as to avoid massive selection and gentrification processes.

According to survey participants, therefore, the greatest challenges arise from the design of public spaces and from the conversion of existing properties (detailed description in the following section). To master both core challenges, not only would construction law have to be made more flexible, but additional private and public capital would also have to be invested (see Fig. 4).

Wherever the expected external growth encounters new regional authorities, there is not only friction, but also the opportunity for new cooperation. Spars (2021, chapter "The Future Viability of City Networks") shows that such city networks may produce additional leeway, both on a small and large scale, thus facilitating the necessary flexibility. It also shows that the path to these networks is arduous and that the crucial questions cannot always be addressed at first. Nevertheless, especially in the metropolitan areas, there should be closer cooperation between neighbouring cities and communities than before.

6 Implications for Real Estate Market Players

Most of the real estate professionals surveyed do not expect a "short-term" normalisation of real estate markets. But what is short-term? Over 80% of survey participants do not expect the pandemic effects to wane for at least a year after its

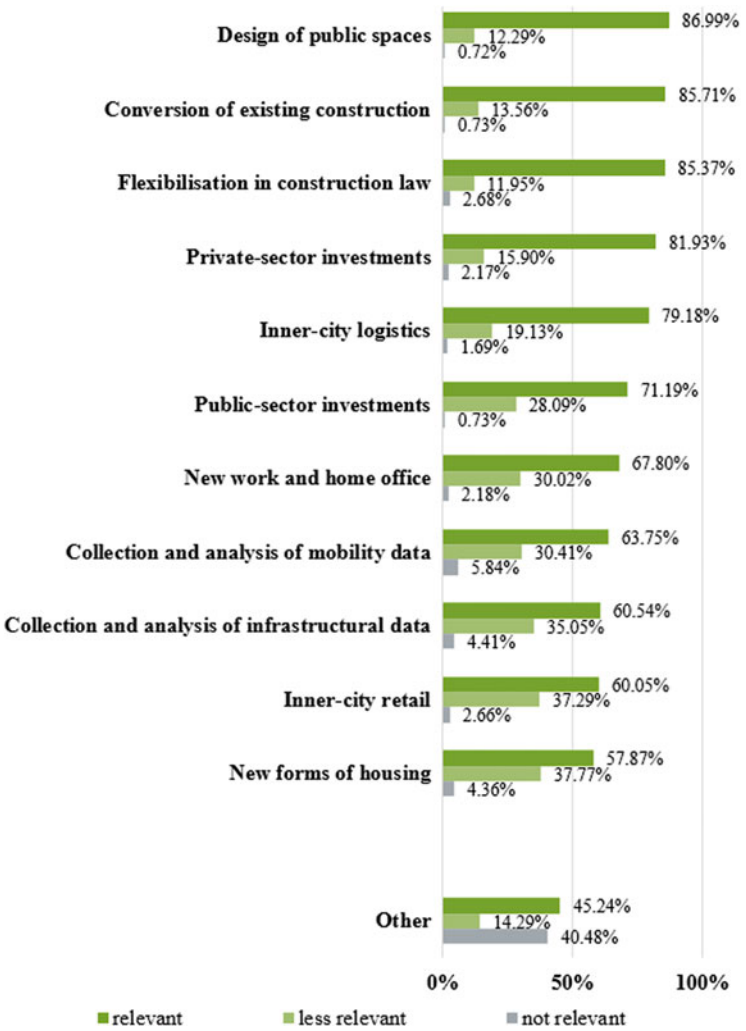

Fig. 4 Relevance for future urban development. Notes: Own data collection on the question "Please evaluate the relevance of the following fields for future urban development"; 1.43%/1.90%/2.61%/1.43%/1.90%/1.90%/1.90%/2.38%/3.09%/1.90%/1.90%/90.02% of all participants did not provide any information; most frequent mentions for others: mobility & traffic, sustainability

end. Almost a quarter of the participants consider it likely that adjustment processes will take at least 3 years (see Fig. 5).

Measured against the expected changes in urban structures outlined above, this assessment is likely to relate at best to the comeback of rental growth and higher space absorption. It is unlikely that the strengthening of neighbourhoods, the mixing of city districts and buildings or the traffic network redesign can occur within a few years. In fact, any changes to urban structures following previous pandemics took

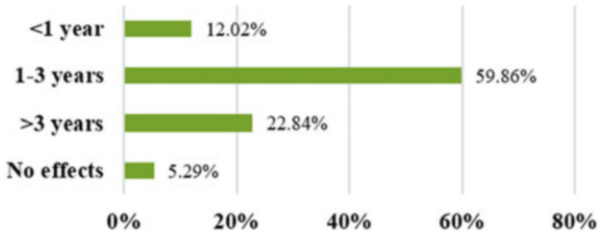

Fig. 5 Effects in the real estate industry will be noticeable in the next 3 years. Notes: Own data collection on the question "How long will the effects of the pandemic be felt in the real estate industry (e.g. changes in urban planning or building regulations)?"; 1.19% of all participants did not provide any information

significantly longer than 10 years. This, therefore, implies far-reaching repercussions for the real estate markets.

The adjustment burdens and opportunities are nonetheless distributed differently among asset classes: the residential segment and healthcare real estate as well as the logistics asset class will emerge stronger from the pandemic, as these asset classes are currently rated as stable core segments. The result is remarkable, especially for logistics, because—despite the increased demand for logistics properties in recent years—this segment was not designated as core—i.e. particularly low-risk—before the pandemic.

Conversely, the pandemic has revealed risk characteristics for hotels or retail properties that were previously largely disregarded in the risk analysis. These property classes are now characterised more as opportunistic and no longer as low-risk investments (see Fig. 6).

The survey shows that a significant increase in housing demand can be expected. Because this additional demand for space can only be partly satisfied within the core cities while more free space could be sought in the vicinity of the dwellings, this demand growth is more likely to trigger external growth in cities than pure urban densification. This external growth enables more open spaces while allowing for additional care and supply offers, as well as innovative mobility concepts to reach inner-city public offers, because not all urban services can be provided within districts (see chapter "Living in the City: Or rather nearby?"—Just & Plößl, 2021). Nevertheless, increased space consumption per residential unit means new challenges, as housing became less affordable for low-income households even before the pandemic. In new construction, this could be offset through a more efficient use of space via flexible floor plans. This is also emphasised by Tom Soreq from ABG Development (see chapter "The Challenge for Developers to Build Attractive Places") and Henrik Thomsen from Deutsche Wohnen SE (see chapter "The Urban Neighbourhood of the Future Is Just One Step Away"). This is often not cost-efficient for existing properties, so the external pressure remains high. Furthermore, they emphasise that the post-pandemic urban redevelopment also requires a renewed interest in the energetic upgrading of buildings. Gorynksi et al. (2021, chapter "Is the COVID-19 Pandemic Accelerating the Path to Smarter

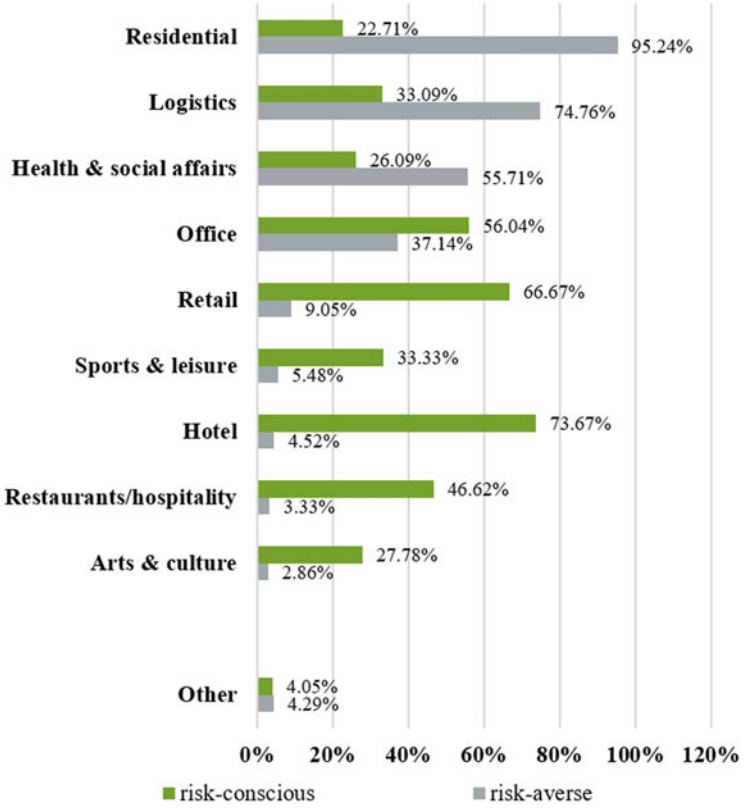

Fig. 6 Housing and logistics in the focus of risk-averse investors. Notes: Own data collection on the question "On which asset classes will the following types of investors focus after the pandemic?"; multiple choices possible; 1.66% of all participants did not provide any information; most frequent mentions for others before the pandemic: data centres and research, food retail; most frequent mentions for others after the pandemic: data centres and research, food retail, facilities for the public sector

Cities?") show in their contribution how the digital transformation into intelligent and sustainable cities and districts can be promoted, and that this process also calls for close cooperation between administration, business, science and civil society.

For the hotel industry, on the other hand, strong consolidation is expected. According to the survey participants, business trips in particular are likely to be fairly limited for the near future. Hotels with a stronger focus on leisure tourism—both in core cities and in the countryside—will likely fare better and return sooner to pre-crisis levels. In their joint interview, Guido Wiese and Tom Soreq from ABG Development also underline the extent to which this industry is affected (see chapter "The Challenge for Developers to Build Attractive Places").

The survey shows that qualitative changes outweigh quantitative ones in demand for office properties, as office space flexibility becomes the key factor. This applies

above all to core cities and increasingly also to the city outskirts (see chapter "The Flexible Office Space"—Plößl & Just, 2021). The interviews with Annette Kröger from Allianz Real Estate (see chapter "Office Work in Post-pandemic Cities and the Importance of Population Density"), Sascha Klaus from Berlin Hyp AG (see chapter "It's About Responsibility, Technology and Culture") and Christian Schede from Greenberg Traurig (see chapter "The Screen Cannot Replace a Sense of Community") show that far-reaching changes have occurred in the office world and that newly created structures will consolidate, but that there will be no "end to the offices" in the near future. All three characterise significant shifts in some functions of offices while pointing out that common spaces are valuable for creating a corporate culture, for creative work processes and for fast and low-friction communication. To a certain extent, the office loses its function as a "production site" for clearly defined processes with pre-defined results, and becomes more of an interaction area in order to find less clear results. Different spaces are required for creative and social processes than for pure errands. For the transformation of the world of work, Kane (2021, chapter "The Future Workplace: Reimagining the Office for the Twenty-First Century") also identifies potential actions for developers and investors, corporate real estate and facility managers as well as for workplace professionals.

For retail space, respondents ultimately expect a sharp drop in demand because the pandemic led to increased competitive pressure from online providers, and thus created new habits and path dependencies. Grocery stores, specialist market centres and discounters are largely exempt from this pressure to adapt. Angelus Bernreuther from Kaufland discussed in an interview the future role of the food retail in cities and, among other things, the mixed-use concepts for adapting retail locations (see chapter "The Importance of the Food Retail Industry for Cities After COVID-19"). The classic inner-city retail is losing its pull because the Internet enables typical consumer benefits in the city centre, sometimes at significantly lower transaction costs. With the digital retail world, a second, virtual city has moved below the physical city, and a new division of labour is emerging between these worlds. The physical retail world should concentrate on the advantages of the haptic and experiences, as well as emphasise this unique selling proposition more aggressively (see chapter "Consumer Cities under Pressure to Change"—Just & Plößl, 2021). Here, too, the city's supply function vanishes, giving up space for social affairs and interaction. This enables innovations and permanent renewal, with the trading function as a mere by-product. This would even save transaction costs and resources compared to the Internet. In short, retail would change with the city, not disappear from the city.

In an interview with Mathias Leidgeb from Palmira Capital Partners, the interviewee clarifies the shifts underway in physical and online trading, and how this will affect the future supply of cities, especially last-mile logistics (see chapter "The Future of Urban Logistics"). In the wake of the pandemic, logistics properties have become a "new core segment". Survey participants also forecast strong growth in space for logistics properties in all regions. One of the major challenges for cities over the next few years will be to simultaneously overcome the surplus of retail space and the shortage of logistics space.

7 Function Shifts

The statements of the interview partners, authors and survey participants suggest that demanded bundles of public and private goods in cities outlined in Fig. 2 (must) have been adjusted during the shock. During the lockdown phases, cities were often unable to exploit their economies of scale as much as they did before, as communication, coordination and negotiation processes were taken over by Internet services, the second city. At the same time, many transactions, not only in retail and gastronomy but also numerous office activities, were replaced by Internet services. This has accelerated the technological penetration of the everyday world. Externalities that arise in cities as a result of the physical gathering of people, their ideas and products have also been partially replaced by network services. This process has not yet been completed.

During the lockdowns and the epidemiological and hygienic protective measures, there were massive restrictions on freedom; many people were (rightly) worried about their integrity, and there were considerable limitations, especially in the amenities of urban life and the direct satisfaction of needs in physical retail (see Fig. 7).

In many spheres of life, there will likely be strong catch-up effects once restrictions are fully lifted. However, wherever the satisfaction of needs is not based on direct physical exchange, but where the previously familiar structures "only" represent a form of transferring goods that may be temporarily cost-efficient, there may be permanent shifts in the satisfaction of needs. In other words, once

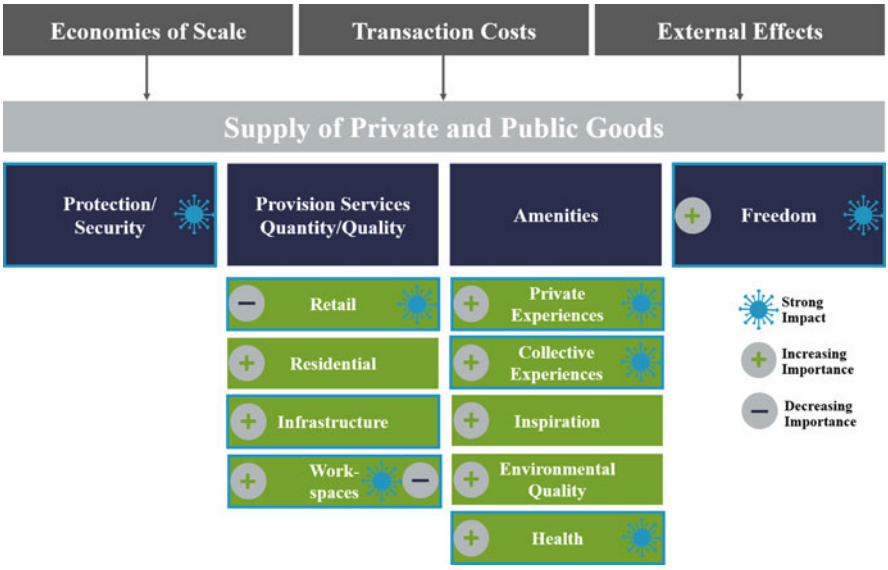

Fig. 7 Supply advantages in cities (post-COVID-19). Source: Own illustration based on Glaeser (1998) and Quigley (1998)

people get used to online consumption and acknowledge its efficiency for certain things, they will hardly return to the old retail world. But they still may if retail trade provides additional offers that require physical interaction, if it is about experience shopping than mere procurement or if stores can make physical retailing more transaction-cost-efficient. The latter could mean, for example, longer opening times or shorter queues at the checkout points. In the meantime, there are tested technical solutions that enable (almost) complete automation at an increasing number of retail stores. Ultimately, this could be linked to the hope of making physical retail more competitive given that, on the one hand, last-mile transport costs are borne by the customer in the truest sense of the word and, on the other hand, because high automation levels in physical retail could support longer opening times.[5]

Overall, there is likely to be a shift between the four offers in cities outlined in Fig. 7 after the pandemic. The clearest effects are likely to be found in the relative weightings of provision services and the range of amenities: some space offers for material needs satisfaction will be less in demand. This could affect retail space but also office space, as the latter required physical presence to conduct largely individual work, where communication between employees was not paramount. Such nearly-industrial services can be carried out regardless of location. In many cases, this happened even before the pandemic albeit without organisational know-how, readiness for work organisation or technical equipment. The pandemic has facilitated the transition from an industrial to a post-industrial, location-independent office organisation. Office space where workers' exchange is relevant, work results are open and chance encounters are important will see increased demand. Shifts in the market for work space supply will yield both winners and losers.

8 Final Remarks

The pandemic has created a massive uncertainty shock for millions of Europeans. The usual (urban) everyday life was interrupted for many months, and a gradual return to something akin to pre-pandemic normality is slowly emerging after successful vaccination campaigns. The path to normality is however uneven and treacherous, largely because infection rates are not yet under control—even in countries with high vaccination rates. Developing and emerging countries will lack vaccination protection programmes for the foreseeable future, so we can expect further waves and a still distant normalisation of travel. It is, therefore, more likely that the post-pandemic normal will not match the pre-pandemic one, but that some adjustments will extend well into the future.

[5] It remains to be seen whether this argument is sufficient for the legislature, because the technical solutions will—at least initially—be more open to larger companies. In most cases, the investment is unlikely to be worthwhile for small retailers. If opening times were linked to the lack of store staff, an asymmetry could arise that could lead to further concentration in physical retail. However, this could hinder a more innovative, flexible and entertaining shopping experience.

The survey repeatedly emphasised that more flexibility is required in many areas including approval processes, building and contract structures, etc. It is precisely this shift to higher flexibility levels that is likely to represent the greatest hurdle in implementation. This is so because it simultaneously emphasises closer cooperation between private and public actors, both in terms of fund raising and know-how. We are only at the beginning of the learning process. With a view to accelerating these learning processes beyond city limits, an intensive exchange of knowledge and experience is necessary to quickly mimic any successful best practices. Here, too, city networks and networks for city representatives can be beneficial.

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Tobias Just is a Managing Director at the IRE|BS Immobilienakademie and professor of Real Estate at the University of Regensburg. Tobias studied economics in Hamburg and Uppsala (Sweden). In 1997, he started to work at the University of the Federal Armed Forces Hamburg. His PhD dissertation was awarded the university science prize in 2001. For more than 10 years, Tobias worked at Deutsche Bank Research. He headed the unit's sector and real estate team and was a member of Deutsche Bank's group-wide Environmental Steering Committee. In 2006, Tobias was a Research Fellow at the American Institute of Contemporary German Studies at the Johns Hopkins University. Tobias published more than 200 papers in professional and academic journals and books. Until 2021 he was President of the German Society of Property Researchers and is the editor of the ZIÖ—the German Journal of Real Estate Research. In 2018, Tobias became a Fellow of the RICS by nomination.

Franziska Plößl is a Research Assistant and doctoral candidate at the International Real Estate Business School/University of Regensburg. Franziska studied Real Estate Business (MSc) at the University of Regensburg and International Real Estate (MSc) at Florida International University, graduating at the best of her class. She has published on various topics, including CREM, nursing homes, and megatrends, in the real estate industry.

Part II

Implications for Urban Development

Urban Planning Aspects of the Resilient City

Silke Weidner

Abstract

The article considers issues in European cities that have been raised by the COVID-19 pandemic and those that have already been identified for quite some time. The pandemic is used as a trigger and catalyst to reflect on central fields in urban planning—city centres and retail, housing, working and living in neighbourhoods, public places and social areas outside the immediate living environment, the transformation of transportation and changed urban mobility as well as the readjustment of spatial planning—with a description of the status quo as well as approaches for improvement by different stakeholders. In conclusion, the concept of sustainable urban development is discussed, which can lead to resilient and resistant cities. The New Leipzig Charter on the transformative power of cities for the common good, adopted in 2020, is presented as a relevant political-strategic framework and the corresponding fields of action, their challenges and potentials are elaborated.

1 Introduction

Since the outbreak of the COVID-19 pandemic and its consequences for urban development, the real estate industry and social coexistence, a great deal has been written in more or less ad hoc fashion. First, some dramatic analytic results and forecasts provided outlooks from a variety of disciplinary backgrounds suggesting that "ein einfaches Zurück in den Vor-Krisenmodus wird es kaum geben" (there will hardly be a simple return to pre-crisis mode) (Schneidewind et al., 2020: 3) or

S. Weidner (✉)
Brandenburgische Technische Universität Cottbus – Senftenberg – Fachgebiet Stadtmanagement, Cottbus, Germany
e-mail: weidner@b-tu.de

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indicating that we are subject to the "größten Stresstest für unser Zusammenleben" (greatest stress test for our coexistence) (Nassehi, 2020). Numerous authors (including ILS, 2020; Wuppertal Institute, 2020; Lieben, 2020) agree that the pandemic has been a "Brandbeschleuniger" (fire accelerant), acting like "Brennglas" (burning glass), a "Teilchenbeschleuniger" (particle accelerator) or "Katalysator" (catalyst) and showing what was already laid out far in advance. As a "Trendverstärker für bereits ablaufende Prozesse" (trend amplifier for processes already underway), according to the Academy for Terrestrial Development in the Leibniz Association (ARL, 2021: 3), or an "unfreiwilliger Feldversuch Corona" (involuntary field test coronavirus) (Hall, 2021), the pandemic has been uncovering vulnerabilities that people have already known and that is now—as if in time lapse—raising public awareness. With this in mind, the Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR) has stated that we are not entering a new era for cities—instead, the focus is shifting towards topics and their challenges and potentials that have long been relevant for sustainable urban development: digitisation, climate change, urban greening, living, working and mobility (BBSR, 2020). Numerous authors have gone one step further and emphasised that the crisis can, and even must, be seen as an opportunity (e.g. Sappelt, 2020), given that highly relevant topics are now gaining social acceptance and reaching a higher level in political and professional discourse. Statements carry such titles as "Don't waste the crisis" (BDA, 2020/2021). And with "Von der Chance für eine Umkehr bis zu Sehnsucht nach Wandel" (From an opportunity for a turnaround to a longing for change) (Reckwitz, 2020), many things now seem possible. Ostensibly, we are facing a reorientation, a transition, in which by overcoming the crisis processes of change are triggered, that then can "als Impuls für bereits anvisierte Weichenstellungen genutzt warden" "(be used as an impulse for course settings already envisaged)" (BBSR, 2021).

The current attitude of expectation towards the future adaptation of urban systems is possibly also high because previous, similar crises in Europe have also led to epochal changes: the cholera epidemic in the nineteenth century introduced water filtration as a specific technical measure into urban life—recognised and implemented by Robert Koch—and was a harbinger for enormous advances in hygiene and health for townspeople (FG Städtebau, TU Dortmund, 2021). Generally, the garden city concept of Howard and Posener (2015) can be cited as the new guiding idea for town planning at the time. The Spanish flu at the beginning of the twentieth century was the trigger for the principle of "light, air, sun" in urban planning that has been pursued ever since. In the course of this, the Athens Charter (CIAM, 1933) was drawn up, which, with multi-dwelling ribbon developments and point-block construction, introduced completely different urban structures and corresponding open spaces than previously known. Post-pandemic urban planning took place then and is still being discussed today. It is a dramaturgical coincidence, but even in this pandemic, a charter for a common European understanding of urban development was adopted under very different framework conditions, with particular emphasis on sustainability and the common good: the New Leipzig Charter on

the transformative power of cities for the common good (Federal Ministry of the Interior, Building and Community—BMI, 2020).

Natural disasters have also repeatedly proved to be a motor for development. If we add to this a challenge facing our society, that of dealing with climate change—which has seemingly been placed on the back burner in general discourse of late—this speaks all the more in favour of a necessary reversal in trend instead of a cautious readjustment in urban planning. There is a clear, if partial, vulnerability of coexistence in familiar and cherished urban structures, and the ability to manage and adapt urban systems is reaching its limits, at least in terms of their critical infrastructures. Examples of non-pandemic-related issues include the refugee crisis with its problems of integration, recurring hot summers with reactions such as the Fridays for Future demonstrations and specific issues relating to major cities (e.g. steeply rising land and rent prices, or rural issues on alternative agriculture and material cycles). Therefore, it can be seen that the question of the character and image of the "city of the future" in an overall structure of society and space began to arise even before the coronavirus pandemic. In this respect, it is true that times of crisis are also suitable for putting hitherto "normal" things to the test in urban and spatial planning and for obtaining consensus for readjustment (cf. Heinig, 2021; Kunzmann, 2021).

The transformative power of cities was already described some years ago in the so-called WBGU report (German Advisory Council on Global Change) (WBGU, 2016). Now, the aforementioned New Leipzig Charter, adopted in November 2020 by all relevant EU ministers, is also focussing on crises, such as the pandemic, and the transformative power of cities in relation to urban planning: "Good urban planning and design should be reinforced to enable compact, socially and economically mixed cities with well-developed infrastructure and a healthy environment and opportunities for identification contributing to the well-being of all. This requires a holistic understanding of high-quality "Baukultur" (building culture) as the basis of integrated planning and design processes for every man-made shaping of the built environment in European cities" (BMI, 2020: 2).

2 Urban Planning Aspects in the Broader Sense

The European city will presumably become a different one after the coronavirus pandemic, or at least since the emergence of the coronavirus, with all its known consequences. But in what respects and to what extent? From the perspective of urban planning and development, there is a number of starting points—both looking back (in historical and contemporary analyses) and looking forward. They take into account both the much-cited acceleration of the fire and the opportunities to be seized. Here we can distinguish between aspects that actually represent newly-added requirements (an existing knowledge and analysis deficit) and those aspects for which the time now seems ripe for them to be heard and implemented (an implementation deficit). To illustrate this distinction: For years or even decades, numerous quality aspects have been set as regional or local benchmarks or

recommendations, such as the proposed amount of green space per inhabitant[1]—even if these were (mostly) not broken down to the immediate and neighbourhood context. Other aspects will only become apparent in the light of the current situation, such as a "balcony quota" required per multiple dwelling. Still others are finding their way from theory into practice, such as Moreno's so-called 15-minute city (Moreno et al., 2021), currently being intensively discussed as a model in Paris and other major cities. Strategic forward-looking actions may now require vulnerability studies and resilience concepts.

3 Propositions and Fields of Action in the Narrower Sense

The basic toolbox of central urban planning tasks can be arranged into the more traditional functional and action fields as well as the main relevant accommodating elements of urban building blocks. The concepts presented below describe the respective situations with causes and conditions on the one hand, while on the other hand highlighting the resulting requirements to implement necessary procedures and ideas. Since interdisciplinary elements of sustainable urban planning, such as a mixed use and short distances, cannot be considered nor dealt with on a sectoral basis, they are dealt with below in a mainly thematic basis.

3.1 The Pandemic as a Driver . . .

. . . For Changed Inner Cities and Retail Situations

During the pandemic, the vast majority of retail establishments were more or less closed. The situation was even more extreme in the hospitality sector. Closed shops and restaurants in mono-functional city centres, here especially high streets, led to an unprecedented emptiness. The pandemic showed particularly blatantly what it means to have relied on a key functional anchor for too long—the (branch-based) retail trade—and thus to be highly susceptible to changes in determinants that impact retail.

The current situation is stimulating an encouraging broad discussion on an old topic from a new dimension: retail is and will continue to be, a leading function of inner cities, but its economic power is clearly diminishing given the form it is in now, leaving room for something new or something old in a new guise.

Well before the onset of the pandemic, changes in shopping behaviour had already led to an increasing shift from physical marketplaces to virtual platforms and their online offerings, thus weakening bricks-and-mortar retail locations.

[1] Several cities have their own specifically defined benchmarks: Munich, for example with 20 m^2 of public green space per inhabitant and 10 m^2 of private green space per inhabitant (including 2 m^2 on the roof) or Nuremberg with 20 m^2 per inhabitant in multi-storey residential buildings; there are (as yet) no nationwide guidelines or reference values.

Pandemic-related, this was initially temporary before coming to a head. All forecasts have revealed that this will also have a lasting impact, with 50,000 store closures expected, mainly among textile retailers (HDE, 2021; IFH, 2020). Empty stores, cafés and restaurants as well as hotel and accommodation establishments have all shown that they alone, as largely mono-functional facilities, can no longer command centre stage in an inner city. Downtown districts and their high streets in (internationally) tourist-intensive cities have been particularly affected. Again, since the 2010s, experts (Taylor & Francis, 2019) have warned against so-called over-tourism, hostelification, eventisation and commercialisation as the unsustainable, one-dimensional coding of city centres and deliberate neglect of the concerns of local residents. Changing travel patterns will persist at least in short to medium term, and consequently, reduced pedestrian frequency will continue to be generated from these sources. City catchment areas are contracting both globally and locally. The dormant cultural sector is also contributing to this trend. Given the predominance of high culture in city centres with its corresponding municipal and state sponsorship, no major changes are expected for the time after the intensive pandemic phase. Added to this is the declining importance of—to use the terminology from the retail trade—aperiodic, special needs of high-cultural offerings.

Therefore, it is not only a consequence of the pandemic-induced economic downturn that larger functional and occupancy gaps are emerging in these locations, gaps that are calling for action: first of all, there is a need to pursue the once lost and now re-proclaimed mixed-use in the horizontal as well as a vertical range of inner city real estate (see Fig. 1). Ground floor zones deserve particular attention. These "gaps" could be partially taken out of global real estate owners' logic of economic utilisation and cross-financed (cf. for example Paris, where the city is buying some of them and renting them to retailers to ensure supply). Various measures are needed to make the leap from years of lip service to actual action. In this context, urban development and planning continue to be called upon to record precisely what consequences occur where (locations) and in which causalities (coupling activities) instead of formulating general dystopias or general recipes. Some small towns, for example have long since lost their branch-based clothing retail stores and have hardly been affected by this pandemic-induced development compared to big cities. Their city centres have long since presented other challenges and opportunities. Drawing on detailed knowledge and evaluations garnered—of rental prices and other real estate market data—mixed-use development can then be orchestrated. Social (e.g. educational and senior citizen facilities), cultural infrastructure and residential use for different demands contribute to making the inner city diverse, less vulnerable and sustainably attractive, as do changed retail facilities, tradespeople, urban production and service providers, which until now have not been able to use inner city premises or workshops because of the rents/purchase prices. Changing living, working, production, and operating models provide the starting points.

Such a goal urgently requires the participation of diverse (local) players and their cohesion—and the pandemic seems to have opened people's awareness for this. In addition, each city needs a director, an artistic director, a leader with a vision for the respective city centre, and the power to motivate and persuade. Such a central

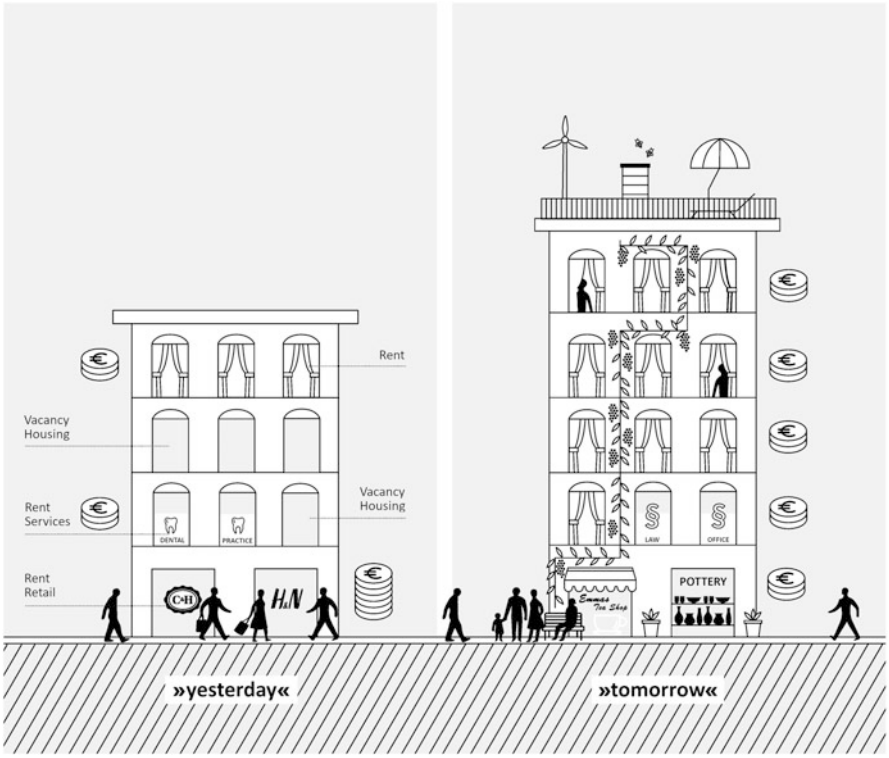

Fig. 1 Inner city real estate yesterday and tomorrow. Source: Super-pixel/BTU

position requires funding from the entire constellation of players. Existing situations and structures determine the degree of their formal connection to the city administration, associations, societies or chambers (of commerce). In addition to such informal approaches, some aspects of building and planning law, as well as emission control law, needs also to be re-arranged.

City centres, with their prominent position, carry the burden of identity for the city as a whole; accordingly, special measures may well be justified here. Consequently, nationwide inner city initiatives are being called for and created by broad interest groups (including the BMI's Inner City Advisory Council) to provide incentives. In addition to the above, approaches are under discussion, such as the establishment of inner city funds (e.g. through the German Association of Towns and Communities (DStGB) and the German Retail Trade Federation (HDE)), simplification options for the conversion of vacant properties in accordance with the ordinance on the misappropriation of property, limitations on commercial rents, etc.

Whatever measures become necessary and possible, in general as well as locally, the pandemic has made it clear that society has been missing the city as a "place of encounters". An urban planning approach in line with the aspects mentioned above

could help to lead from the oft-proclaimed death of the city centres to their rebirth, taking on board the knowledge now gained.

. . . For a Different Way of Living, Working and Living in the Neighbourhood

In addition to the inner cities, other urban building blocks are coming under scrutiny. The pandemic is even pushing mono-functional residential neighbourhoods and office parks to their functional limits, and it is quite plausible that this will continue in the future. In residential areas, which have had to quickly function as a place to live and work in one, there is not enough separate space to take a break and go for lunch, and there is a lack of (open) space for short breaks with opportunities for relaxation and exercise. On the other hand, not only office districts are largely empty, so are hospitality facilities, fitness studios and other upstream and downstream service businesses associated.

The configuration of living and working space from home, of care (home schooling, care, etc.) and leisure behaviour requires extensive adjustment. There are current indications of space being redistributed, manifested by a decline in (demand for) office space and a simultaneous increase or at least stagnation (in Germany at an already high level) in demand for residential space. The need for a stronger mix of functions with corresponding building and residential typologies, equipment and linkages will also become inevitable. These aspects require evidence for future planning and development. In residential properties, floor plan adaptations are needed that allow people to work from home, allow people to be cared for—and this to be provided in one place at the same time—not as a permanent and rigidly fixed format forever, but with a degree of flexibility to cover needs in the short term. The call for such flexible floor plans, including sharing options in flexible common spaces, is not new: until the pandemic, the call was just barely heard.

Special properties for senior citizens or students have already been designed in this way; elsewhere, only building units or modules have managed to create living space of quality—mostly in large cities—in such a way that would provide the opportunity for both isolation, if rest is needed, and gatherings for social contact. The much-cited trend towards co-living and co-working is thus gaining new impetus in the wake of the pandemic and its requirements.

However, it is necessary to re-evaluate the demands on future forms of housing—due to an increased shift in use both of homes and in the wider environment—for all households given their respective differences in the neighbourhood. Appropriate private (balconies, loggias, green rooms, terraces, communal areas on roofs, etc.) and public open space availability and design (see below) need to be taken into account in addition to the mix of use in the neighbourhood. Given this sharpened perception of the immediate living environment and the narrowed radius of action in the locality, the neighbourhood will need to be fully charged (Shenker, 2020), also psychologically, if it is to offer all the necessities of life (including offers for local supplies, culture, social support and health). In this sense, Schnur speaks of "Postmodernen Nachbarschaften" (postmodern neighbourhoods) as a point of

contact for describing the fundamental change in the social world: a neighbourly way of life that decidedly does not follow any predefined identities, thus moving on from modernity with clear categories and classifications (Schnur, 2020: 1). With regard to future planning, Scheuermann refers to neighbourhoods as the "Keimzellen und Herzstück nachhaltiger Stadtentwicklung" (nucleus and heart of sustainable urban development) in which "bürgerschaftliches Engagement stattfinden" (civic engagement will take place) and which will and must be "Labore für die urbane Zukunft" (laboratories for the urban future) (Scheuermann, 2020).

In the course of the pandemic and the (re)recognition of the immense importance of green spaces and public squares as meeting places, the existing conflict between building density in inner cities and securing open spaces has come to a head. Disease prevention and urban density are initially not contradictory, as demonstrated by a comparison of infection figures for metropolitan and sparsely populated regions and towns worldwide (Florida et al., 2020, see also chapter "Revisiting the Economic Effects of Density in the Wake of the COVID-19 Pandemic"—Ahlfeldt & Pietrostefani, 2021 and chapter "Density and the Spread of COVID-19 in Cities: Lessons from the United States and the United Kingdom"—Carozzi et al., 2021). The increasing criticism of existing urban densities is therefore too narrow, also in retrospect of past urban planning and town planning epochs. Residential densities are juxtaposed (cf. well-illustrated synopsis: NVK, 2018: 6–7), which on the one hand cite the popular Wilhelminian Style structure with a closed block edge (approx. 150 residential units/hectare), but on the other hand formulate open space requirements that would be more in line with a ratio of 50 units/hectare and thus multi-dwelling ribbon developments. What should therefore be discussed is rather the changing demand for use as described above (quality instead of quantity). In order to ensure the provision of tried and tested, quality elements of the European city, such as short distances, and still provide attractive and sufficient open spaces, the parameter of use density is certainly to be preferred to settlement or housing density.

Other approaches can be added, such as the biotope area factor applicable in Berlin, which leads, among other things, to greening roofs. These are stepping stones in this direction but require further development in terms of content and concrete implementation. In this respect, the course of the pandemic in cities of different sizes and densities needs first to be thoroughly evaluated. Analysis and planning must then consider other "Obsoleszenzen und Redundanzen" (obsolescences and redundancies) (Rettich, 2021: 8) that result from non-related abandonment and land reductions (shopping malls, car parks, cemeteries, etc.). The central concern of urban planning in this field remains guaranteeing an adequate density of use as well as pursuing the so-called double inner city development (balancing space and ecology in building densification) in order to provide attractive living spaces.

. . . A New Appreciation of Public Places/Spaces and Meeting Areas Outside the Immediate Residential Environment

A core element of the European urban model (Siebel, 2004) concerns public urban spaces with their significance for urban coexistence. The pandemic and the resulting

reduced radius of action have made it clear that, in addition to sufficient and high-quality green and open spaces in immediate residential environments, there is a lack of areas for exchange between neighbourhoods (so-called third places, Oldenburg & Brisset, 1982) or these have not been adequately created. According to surveys, a population's demand for exercise in open spaces and thus for usable areas, parks, gardens and nature has increased sharply (Forsa, 2020)—undoubtedly intensified by travel bans and one's own mono-locality.

The needs and locality-based planning approach (BMI, 2020) that takes account of and applies the basic principles of openness, accessibility and reachability (on foot), appropriability, options for retreat, and sometimes to play had been pushed into the background in urban and open space planning for too long. Instead, other criteria, such as low production and management costs (maintenance and cleanliness) and top-down planning and design, seemed to dominate in many places.

Now, there is a need, and also an opportunity, to reorient the design of public urban space. Multi-coded and thus multi-usable (according to season, time of day, etc.) areas for sport, play, recreation, rest and relaxation, and diverse communication areas are required to provide a variety of offers and uses. Location and surroundings (catchment area, social structure, immediate outskirts) should provide the framework instead of unspecific and "off-the-peg" design patterns. Von Lieben aptly refers to this combination as "Zusammenlebensraum" (co-living space) (Lieben, 2020), which can extend to managed offerings (urban gardening or the like). Cities in Spain (Barcelona) and especially Denmark (Copenhagen) have been implementing good examples of such approaches for some time now. They are with these (for example the landscape park superkilen or israel plads in Copenhagen) far closer to the formulated requirements than is largely the case in Germany: process design for iterative participation, collective city making, etc. have all been addressed centrally. In the general planning discourse, discussions and projects that place people at the centre and focus on implementation can be found under a variety of names and forms. Tactical urbanism (Lydon & Garcia, 2015), for example is an approach to a responsive planning system that implements projects in the short term while enjoying intensive citizen participation. Here, the action is in the foreground. Alternatively, there is self-responsible city making, also referred to as do-it-yourself (DIY) urbanism, where the focus is on spontaneous appropriations of places by people who want to have a responsibility to shape the city. In this field of action, the what and why are usually well analysed, but there tends to be a deficit when it comes to the implementation. Technical competences and responsibilities distinctive from each other, as well as a lack of relevance in assessment procedures, have contributed to this.

The clear lessons learned from the pandemic could help form interdisciplinary project groups in local administration and make plans and decisions together with other stakeholders from society. A blending of strategic planning and rapid, concrete implementation should be the goal.

Another dimension needs to be taken into account in urban and open space planning. In addition to the aesthetic demands and the manifold needs for use and appropriation by the population, there is also the aspect of resource orientation

(e.g. with regard to green-blue infrastructures [sponge city principle, urban cooling, etc.]). Here, the pandemic is not so much the driver as climate change and, in general, a growing demand for sustainability in planning and society. Considerations of so-called ecosystem services with their natural-cultural services (Neumann, 2020) as well as of the health factor could make the value of urban green space calculable, and possibly provide a good approach to addressing the real estate industry as well as other industries.

. . .For a Traffic Turnaround with Changing Urban Mobility

The call, or need, for people to maintain a social distance to reduce the incidence of infection has led to two manifestations that clearly impact behaviour in the short term, possibly also in the longer term: to its detriment, public transport is becoming stigmatised, and this has been coupled with the parallel increase in car use relative to the number of journeys; at the same time, the number and length of journeys made on foot and by bicycle have increased, although in many places the infrastructure is not suitable for these additional journeys (see chapter "How COVID-19 is changing Mobility Behaviour and what that means for Sustainable Urban Transport"—Jarass et al., 2021). In order to resolve this competitive situation in an ecologically sensible manner and finally replace the planning ideal of a car-centric city, public transport must first be made more attractive. This means in terms of image as well as an actual upgrade in the vehicle fleet, frequencies and cycles as well as in sustainable drive systems. To kick-start, the traffic turnaround, positive temporary concepts, such as pop-up cycle paths, options for the alternative use of traffic space, etc., should be replaced by permanent measures after the pandemic. A combination of different means of transport and sufficient and high-quality space for different types and speeds of movement or visits go hand in hand with this. In connection with the new neighbourhood concept explained above and the 15-minute city concept, special attention should be paid to pedestrian and bicycle traffic as well as to sharing models in flowing and stationary modes, and their areas should be divided up in a new and fair way (Wilde & Klinger, 2017). Alternative urban transport concepts can serve as a basis for numerous measures. They should be able to map newly forming traffic flows thanks to increasing digitisation and smart technology, redistributing land allocations and spatial layouts and thus forming the basis for implementing urban planning.

In contrast to the topics mentioned above, this is not so much a matter of calling up and readjusting ideas that have already been developed; instead, there is a distinct lack of convincing concepts and practices. Neither climate change nor the pandemic has yet succeeded in triggering a radical change in society's pro-transport attitude. In addition, in the field of mobility, it is also important to break away from sectoral thinking and to coordinate activities and responsibilities in the public space as a whole, including street spaces, in an interdisciplinary manner (Baukulturbericht, 2020).

. . . For a Readjustment of Spatial Planning

Finally, the issue of spatial planning beyond the local environment can only be touched upon at this point. This addresses federal, state and regional planning. In order to be able to implement both the identified needs of cities and approaches to urban planning with little conflict, it is also necessary to think on a larger scale. In any discourse on urban densities, functional interdependencies and changing demands on living environments, leisure activities and sustainable lifestyles, for example we need to consider the role of small and medium-sized towns in a post-pandemic situation. Far more than is the case today, these cities can serve as anchors in space and thus create a new balance between city and countryside, or growth and shrinkage. We saw the first signs of this before the pandemic (Weidner, 2020b), but a trend reversal requires a far different set-up with attractive infrastructure as well as a stock of contemporary forms of housing, social and technical care services and good connections to metropolitan areas and large cities. Approaches to increased inter-municipal cooperation, the recognition of the division of labour and considerations of circular economy processes are also part of this. The overall structure of big, medium-sized, small cities and villages needs to be readjusted in this respect, taking into account the central-location principle, equivalent living conditions, etc. (see Fig. 2 for abstract attributions of tasks, functions and identities as well as interrelationships).

4 Guiding Principles for Sustainable Urban Development: Resilient, Robust and Crisis-Proof Cities

The topics and fields of action identified are to be considered together with their respective embedded approaches. Urban planning sees itself per se as interdisciplinary, acting across sectors and having been committed to the guiding principle of sustainability for about 20 years. This "guiding" perspective also seems to be valid in the pandemic or post-coronavirus period—with a varying emphasis on different sub-issues such as resilience, robustness (Stadtbauwelt, 2020) and subsistence. Some researchers or practitioners have also mentioned new megatrends, such as connectivity, which can also be subsumed. Still others stand by other guiding principles, such as the smart city, but then with far greater emphasis on social and ecological smartness. In doing so, they are correcting their chiefly technical or technological orientation to "smart" in the original sense of the word. This represents a further development of what we have in that people themselves, through their experience of the pandemic, once again become the focus of these visions and utopias of urban planning.

The Leipzig Charter of 2007 already placed sustainability at the heart of its messages on strategic urban development. The New Leipzig Charter now places the common good prominently in the foreground without replacing the guiding principle of sustainability. Rather, the targeted crisis resilience across fields of action is very closely related to the triad of sustainability of European cities: towns and

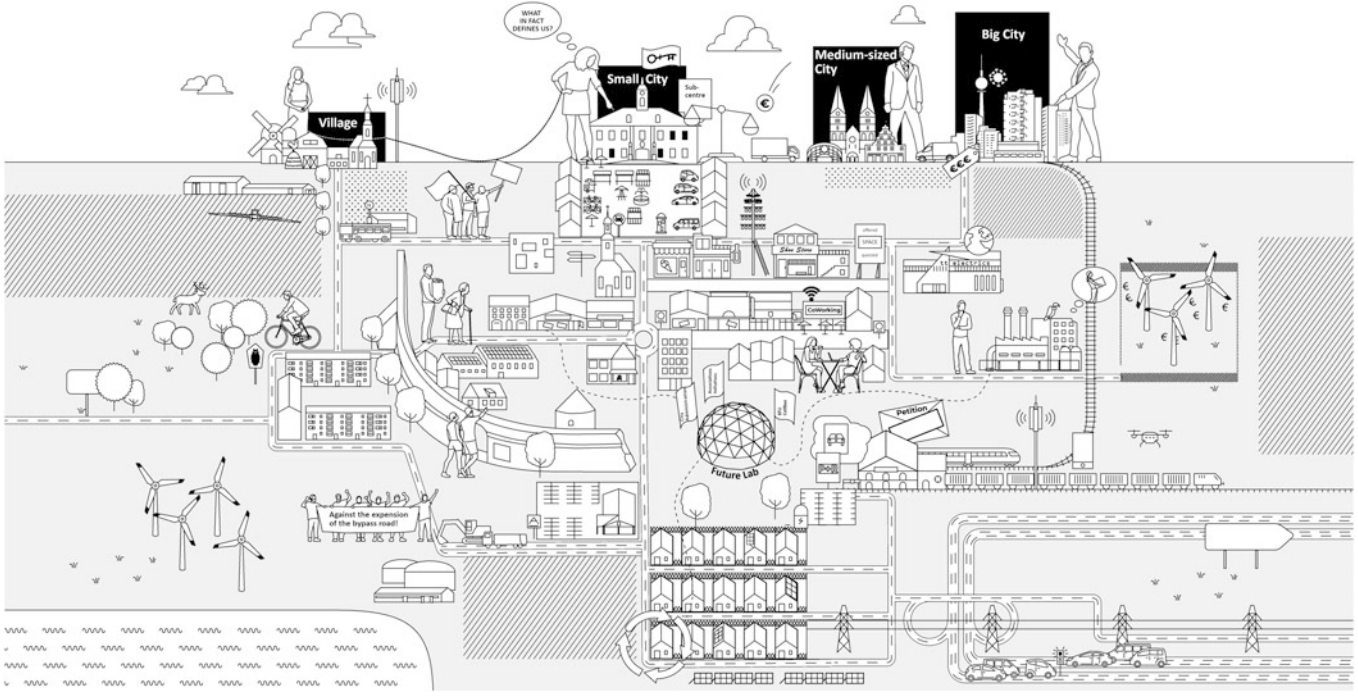

Fig. 2 Spatial, settlement and functional contexts. Source: Studio Amore/BTU

cities with a prosperous economy, a social and equitable urban society, and environmentally and climate-friendly solutions for living, working, movement and recreation (BMI, 2020) are seen as robust.

The concept of resilience, which was discussed and weighed up in the national and European dialogue among the numerous stakeholders involved in drafting the new Charter (Weidner, 2020a), was ultimately not included in the strategy document. Instead, it openly formulates: "Cities and urban systems need flexibility as well as the ability to respond to external disruptive events and chronic stress. The robustness of cities to cope with changing framework conditions should be supported by an ability to learn from past events and from each other, . . . as well as balanced implementation of just, green and productive cities." (BMI, 2020: 2). With its integrated, participatory, place-based approach that builds on multi-level dialogue and focuses on the common good, the Charter also formulates principles that help cities become adaptive and resilient. Co-creation and co-production give rise to social innovations, coupled with one's own sense of responsibility and identity (BMI, 2020). Again, this is nothing entirely new, the approaches to DIY urbanism/self-made urbanism mentioned above are well known. However, the Charter calls for this to be taken to the next level, to be included in the already extensive toolbox of urban planning.

Cities cannot be made completely safe from crises, as history teaches us, but they can possibly be made more crisis-proof. In terms of planning, the various urban components, whether city centre or neighbourhood, central or suburban, must be capable of offering universal spatial characteristics so that adaptation can take place in line with needs, including changing needs. From an urban planning perspective, the task now is to move from the still ongoing crisis management to this conceptual crisis prevention, addressing the identified strategic challenges of sustainable spatial development and anticipating further unexpected events and their consequences in formal planning and informal action plans in the short, medium and long term (ARL, 2021). This should not be absolutely geared to a concrete target picture—this itself is a learning effect—but should be scenario-based. As the New Leipzig Charter states: "Predictive and preventive policies, plans and projects should include diverse scenarios to anticipate environmental and climatic challenges and economic risks as well as social transformation and health concerns" (BMI, 2020: 2).

In order to shape all this, another core element of the 2020 Charter, comes into play: empowering cities to transform. In this respect, the pandemic has shown that short-term and specific responses can and must be taken at the local level. This is conclusive as far as it goes, but a key risk for the medium- and long-term approaches discussed above lies in the financial consequences of the pandemic (Heinig, 2021; Bunzel & Kühl, 2020). The financial framework for urban planning as a municipal task of self-governance, of planning sovereignty, will become narrower, due among other things to the expected slump in trade tax revenue (DIFU/ZEW, 2020), limiting the scope for action.

5 Summary and Outlook

In the wake of the pandemic, the immediate urban environment is in focus for each individual, as it was rarely the case before. Answers to the questions such as: "How do we live and work"? "Where do we shop, spend our leisure time or holidays"? have become quite central. This means that issues of real estate, architecture, urban planning and infrastructure are motivating people more than ever. This is a breeding ground for innovative and collaborative urban planning. The current challenges are thus offering an opportunity to rethink and renegotiate fundamental parameters of urban development such as density of use, functional mix, short distances, serving local needs, open spaces and public space. Not only does it require, but it also creates space for experiments that were hardly or not at all possible or desired before. Temporary changes introduced during the pandemic—for example in the organisation of rooms and spaces, in the context of new working and living arrangements—have in some cases proved so successful that their continuation should be carefully examined.

Most of the challenges have been identified. However, as the pandemic has accelerated or intensified, some developments or signs—or even raised new ones—ideas and solutions already developed no longer apply exactly or do not yet go far enough. Against this background, urban planning must be given the opportunity to move from knowledge to action in the various fields of action. To do this, the discipline and all its players need the space, support and goodwill to experiment in the short term. From the perspective of municipal practice, Burgdorff summarises ad hoc action during the pandemic by stating that urban planning "schnell sein muss, damit die Tristesse sich nicht verfestigt" (must be quick now so that the gloom does not become entrenched) (Burgdorff, 2021). And in order to learn continuously and with all openness, a new culture of dealing with errors is needed.

In literature, triads on new urban qualities are in vogue, with studies entitled "Stadt der Zukunft. Intelligent, resilient & nachhaltig" (City of the Future. Intelligent, Resilient & Sustainable) (Raum, 2020) or "näher—öffentlicher—agiler" (closer—more public—more agile) (Schneidewind et al., 2020). The outlooks are full of expectation and aim at "doing better", as many a quote conveys: "Nachnutzung der Ruinen der modernen Gesellschaft" (Re-using the ruins of modern society) (Maak, 2020).

The BMI launched a call under the National Urban Development Policy (NSP) and has been funding 13 pilot projects for the post-coronavirus city since 2021 (3.5 million euros until 2023). Innovative and exemplary solutions for crisis-resistant urban and neighbourhood structures are to be tested in the fields of "Solidarische Nachbarschaft und Wirtschaften im Quartier" (solidarity-based neighbourhoods and neighbourhood economies), "Öffentlicher Raum, Mobilität und Stadtstruktur" (public space, mobility and urban structure) and "Integrierte Stadtentwicklungsstrategien unter Berücksichtigung von Resilienzaspekten" (integrated urban development strategies taking aspects of resilience into account) (BBSR, 2021). A memorandum entitled "Urbane Resilienz—Wege zur robusten, adaptiven und zukunftsfähigen Stadt" (Urban Resilience—Pathways to a Robust, Adaptive and Sustainable City)

(BMI, 2021) continues the Leipzig Charter at national level and explains the demands and opportunities of urban resilience. Numerous other individual experiments and projects under diverse sponsorship are also underway.

Therefore, urban planning does not have to be completely reinvented in the wake of the pandemic: on the one hand, examining what has been recognised, understanding reaction patterns, negotiating appropriate approaches to action and consistently applying existing instruments should suffice to combine experimental forms of living and working with innovative open space and community offerings, climate-neutral energy and mobility concepts, and in doing so provide liveable and sustainable cities. On the other hand, the rigorous implementation of this is challenging enough to achieve greater success. As indicated in the individual topics, well-founded, up-to-date analyses and evaluations, interdisciplinary, jointly-agreed conclusions and strategic as well as operational immediate action at local level are the basis for good planning and design. The integration of other process elements, such as broad participation and co-creation (BMI, 2020), are additional factors for success. Ultimately, a promising approach to complex tasks is based on collective intelligence and creative collaboration in new cooperation structures. Legal and factual adjustments are also needed. In the overall process, appropriate consideration and negotiation processes related to urban planning should also not be neglected (DIFU, 2020).

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Silke Weidner studied spatial and environmental planning at the University of Kaiserslautern and then worked as a project manager in various planning offices before finding her way back into academia. In 2004, she completed her dissertation at the Faculty of Economics at the University of Leipzig and subsequently held the junior professorship "Urban Management." Since 2009, she has been head of the Department of Urban Management and, since 2016, of the Institute of Urban Planning at the Faculty of Architecture, Civil Engineering and Urban Planning at BTU Cottbus-Senftenberg. In addition, she has run the planning and consulting office |ulm|s| Stadtstrategien in Leipzig as managing partner with a colleague since 2004. Her main interests and topics are sustainable and integrated urban development—also in the context of Europe—transformation, and structural changes in small and medium-sized cities, especially in inner cities. She teaches, researches, and works in the contexts of the respective processes, stakeholders, and tools. She is also active in numerous committees, advisory boards, juries, etc. and is a member of the German Academy for Urban Development and Regional Planning (DASL), the Saxony Chamber of Architects, the Association of Urban, Regional and State Planning (SRL), the German Society of Property Researchers (gif e. V.) as well as the Wissensnetzwerk Stadt + Handel e.V.

The Health Equity Imperative and the Role of the Built Environment

Sara Hammerschmidt

Abstract

The impact of the COVID-19 pandemic in cities around the world has further illuminated a long, global history of public health outcomes being shaped by the design of our built environment—all buildings, spaces, and systems that are created, modified, or used by humans. While health outcomes are shaped by many factors—including genetics, personal behaviour, and access to health care—research shows that the built environment has played a role in rising rates of chronic disease, and land-use professionals, including urban planners, designers, and developers, have a responsibility to design spaces and places that equitably promote positive health outcomes. The fields of public health and urban planning emerged in tandem to address the infectious diseases prevalent in the nineteenth and early twentieth centuries and must continue partnering to reverse the trends of chronic diseases, such as obesity, diabetes and heart disease. As health outcomes are not equitably distributed across all demographics, with communities of colour and low-income communities disproportionately impacted with higher rates of chronic disease and higher rates of COVID-19-related deaths, seeking to create healthy buildings and cities that are accessible to all people needs to be a priority within the land-use industry.

1 Introduction

The world is facing public health crises of unforeseen proportions. The COVID-19 pandemic has shown that infectious diseases are still a real threat to global health, and the severity of illness is highly variable from person-to-person, causing fear and

S. Hammerschmidt (✉)
Urban Land Institute, Washington, DC, USA
e-mail: Sara.Hammerschmidt@ULI.org

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stress for people all over the world. Mandatory quarantines and lockdowns have limited mobility, and though technology improvements over the past decade have made it easier to live sedentary lifestyles while still staying connected, the pandemic has served to exacerbate inactivity and feelings of isolation for many people. Moreover, the world has already been experiencing increases in rates of chronic disease over time—including obesity, diabetes, asthma, and cardiovascular disease—due to factors such as decreased physical activity (e.g. WHO, 2017, 2018, 2020a, 2020b; Asher et al., 2020).

There are many interrelated factors contributing to individual health outcomes, including family and home conditions, socioeconomic status, access to healthcare, genetic, and behavioural factors, access to and consumption of unhealthy foods, amount of physical activity, housing conditions, social cohesion, and indoor and outdoor air quality. But evidence suggests that the built environment—all buildings, spaces, and systems that are created, modified, or used by humans—plays a crucial role in driving the increases in chronic diseases (e.g. Perdue et al., 2003; Frumkin et al., 2004; Sallis et al., 2012).

The built environment influences the physical, social, and mental health of communities, in part by limiting physical activity opportunities, social cohesion, safe, and convenient access to transportation, healthy food, hospitals, and clinics. Due to these links between the built environment and human health, it is critical that disciplines that make decisions pertaining to the built environment—including real estate development, architecture, and landscape architecture, as well as urban planning—work closely with public health practitioners to ensure that human health is a factor that guides land-use decisions.

2 Health Outcomes and Land Use Are Inextricably Linked

Chronic diseases have ranked as the top leading causes of death for many years, as infectious diseases that were deadly in the past were all but considered eradicated with the advent of vaccines in the early to mid-twentieth century. The fields of development and urban planning, throughout the twentieth century, helped create urban sprawl, particularly in the United States and somewhat later also in many Asian, Latin-American, and African cities, which led to the decline of walking and biking for utility, especially as the automobile became more prevalent and affordable. Many Americans fled cities for the suburbs, seeing them as quieter and cleaner, where they could have access to larger homes and more space. This "white flight" out of urban areas contributed to disparities in living conditions between different racial groups, particularly white and Black people, which has led to significant health disparities as well. Housing and tax policies in the United States promoted suburban homeownership for the white working class while concentrating public housing for lower income people in cities. European city governments, by contrast, constructed mixed-income apartment buildings post-World War Two, which were available to a wide swathe of residents and distributed across cities rather than concentrating them in the urban core (Pietro, 1999). While disparities in health outcomes are widespread

across the world, in the United States the focus has been on reducing disparities along the lines of race, while in Europe, the focus is more broadly on socioeconomic factors, including education and income (Docteur & Berenson, 2014).

Many conditions account for differences in the health and lifespan of people across the globe. These conditions are referred to as the social determinants of health—the environments into which we are born, live, work, learn, play, and age (ODPHP, 2021)—including access to education, jobs, and health care, as well as income levels, social and community context, and built environment factors including access to healthy food, housing, and transportation. The Robert Wood Johnson Foundation, the largest philanthropists in the United States focused solely on health, mapped life expectancy by zip code and found that in cities across the country babies born just a few miles apart have vast differences in their life expectancy (RWJF, 2020). Frequently these differences can also be mapped to race. In 2019, the city of Chicago had a 30-year gap in life expectancy between neighbourhoods, the largest gap for any city in the United States: the Streeterville neighbourhood had a life expectancy of 90 years, while just 9 miles south, the Englewood neighbourhood had a life expectancy of 60 years; Streeterville is majority (over 70%) white, while Englewood is majority (over 90%) Black (Schencker, 2019). Similar data is seen in zip code maps across the country, which has led many researchers in this field to state that a person's zip code is frequently a better predictor of health outcomes than a person's genetic code. The New York Times reported in February 2021 that the life expectancy gap between Black and white Americans as a whole widened during the pandemic to a 6 year gap; the widest in over 20 years (Tavernise & Goodnough, 2021). Environmental causes are likely to play a role in these gaps and disproportionate impacts.

Reducing chronic disease, with a particular emphasis on reducing disparities in chronic disease rates among different socioeconomic groups, is critical to mitigate the impacts of future pandemics. COVID-19 has been shown to disproportionately impact Black and Latinx people, who are already more likely to have high rates of chronic disease (Oregon Health & Science University, 2020).

While medical professionals may not fully understand why some people have more severe COVID-19 symptoms or why some cases end in death, there appears to be a high likelihood that people with certain medical conditions—including obesity and diabetes—are at an elevated risk of severe illness (CDC, 2021). Land-use professionals have a role to play in reducing rates of chronic disease by ensuring that our cities and buildings are designed in ways that make the healthy choice—for example to take stairs rather than an elevator or to walk to work, school, or the grocery store—an easier choice for all people.

3 The Role and the Imperative of Land-Use Professionals for Public Health

The urban planning profession, which focuses on the development of land and land-use patterns across a city or region, was initially intertwined with the field of public health as both fields emerged in part to address infectious disease issues in nineteenth century cities. The fields worked together to improve human health through built environment interventions, and as housing and sanitation reform led to improvements in infectious disease rates in the early twentieth century, the fields took disparate trajectories. Public health focused on immunisations and individualised health behaviours, such as smoking, diet, and exercise. Urban planning adopted zoning as a tool for solving urban problems, and though the intent of zoning included protection of public health through land-use patterns, it mainly served to separate the well-off from the least well-off through the inequitable technique of exclusionary zoning. In the later part of the twentieth century, a health discourse re-entered the planning profession through a renewed focus on environmental health and the adoption of major environmental planning regulations, including the National Environmental Policy Act (NEPA) in 1969 and the Clean Air Act in 1970. However, these regulations focused largely on the health of the natural environment rather than the implications of pollution for human health.

By the late twentieth century, both fields had become disconnected in research and practice: both from each other and from their original intent of protecting human health through built environment interventions. However, the early twenty-first century saw a revival of research and collaboration addressing these disconnects and suggesting that opportunities and strategies exist for alleviating current health issues that are linked to the way our cities are planned, designed, and built.

Land-use and health professionals must collaborate more consciously to critically and holistically analyse current processes and propose policies and plans that promote equitable and healthy communities. In the same way that a principle of prevention, rather than treatment, has emerged within the public health field, planning has started evolving away from the notion of separated land uses that prioritise the automobile to a new recognition of the importance of compact and walkable places for economic growth and environmental sustainability through movements such as Smart Growth and New Urbanism. Development patterns across the twentieth century in the United States were much less compact than in European cities due to several factors, including the sheer availability of land and the pervasiveness of automobile ownership (Pietro, 1999). Now, urban policies, including zoning and parking, are being reformed in many cities across the United States, where large parking lots and single-family neighbourhoods are prevalent, to encourage and support a variety of transportation modes and housing types. In the United States, the healthy cities movement is still relatively new, following the widespread success of sustainable development. But European cities have had a framework in place for more than three decades: the World Health Organization's European Healthy Cities Network was established in the late 1980s and has brought together 100 cities with a vision of creating "healthier urban settings that support the health

and well-being of the people that use them" (WHO, 2021). The United States can learn from the compact development and support of multimodal transportation that is the norm across cities in Europe.

To realise built environment improvements that ensure healthier and more equitable cities, all sectors must play a role, and must partner with health professionals to ensure that projects at all scales are appropriately addressing health concerns. Developers and designers can incorporate healthy development principles into projects from their inception, following recommendations from rating systems—such as BREEAM and the International WELL Building Institute—and from evidence-based reports such as the Urban Land Institute's *Building Healthy Places Toolkit*. Public officials and public sector employees, including urban planners can advocate for and implement policies that prioritise community engagement and health, make intentional investments into public infrastructure—such as transportation systems and parks—that more equitably serve residents, and incorporate health into master planning efforts as a key community value. No one sector is responsible for ensuring that our cities are planned and developed in ways that improve health for all people—it will take partnerships, education, intentionality, and political will. To reverse trends in chronic diseases that disproportionately impact upon people who are low-income and people of colour, prioritising health must become as mainstream as prioritising environmental sustainability.

4 Transformations to the Built Environment to Improve Infectious and Chronic Disease

The pandemic has shown that highly infectious diseases are not a thing of the past. Developers, designers, planners, and public officials are making temporary as well as permanent changes to buildings, streets, and parks to address needs that have arisen due to the pandemic. The design and operation of buildings are changing to lessen or prevent the spread of airborne viruses. For example upgraded ventilation and filtration systems to protect indoor air quality will likely become a standard in a world where, on average, people spend 90% of their time indoors.

But particularly during an era of lockdowns and shelter-in-place orders, people are seeking out nearby outdoor space more and more. Equitable access to parks and open spaces is even more critical as growing evidence shows that outdoor spaces pose less risk to virus transmission than indoor spaces (Bulfone et al., 2021). In a world of physical distancing balanced with an innate need for connection, public spaces in cities across the globe are being transformed in innovative ways that allow for physical activity, recreation, social connectedness, and economic prosperity—all ingredients to support healthy lifestyles and reduce chronic disease.

Cities across the globe reclaimed streets—some temporarily, some permanently—for outdoor dining and shopping, and for infrastructure changes to encourage walking and biking. Dublin, Ireland and Montreal, Canada both temporarily reallocated road space for walking and bicycling routes; some of these new routes may be made permanent. Dublin created over 6 miles of protected cycle lanes and

6749 sq ft of new pedestrian space as of December 2020. Montreal's program, "Safe Active Transportation Circuits", links neighbourhoods and four city parks with pedestrian and cyclist paths. Seattle, Washington's "Stay Healthy Streets" programme fully closed 25 miles of streets in 13 locations to vehicle traffic; the mayor has committed to making some of these closures permanent (see chapter "How COVID-19 Is Changing Mobility Behaviour and What that Means for Sustainable Urban Transport"—Jarass et al., 2021).

In addition to transforming streets, cities, and businesses are expanding access to parks and ensuring that parks are safe to visit. An arts organisation in Elblag, Poland, partially mowed their lawn into a checkerboard pattern, transforming it into a physically distanced park. Domino Park in Brooklyn, New York, installed 30 "social circles" using white chalk paint, each 8 ft in diameter and 6 ft apart.

The benefits of parks and green spaces became even more evident during the pandemic. To increase the amount of green space available to residents, cities including San Francisco, California, and Atlanta, Georgia opened golf courses to the public for additional spaces to walk, picnic, and be safely outside when other parks were initially closed. And in Singapore, where people have been spending more time in open spaces and bicycle sales have soared during the pandemic, increasing the amount of urban green space is a city priority (ULI, 2021).

If developers, planners, and architects better design spaces to provide safer alternatives in the COVID-19 era—for example designing attractive staircases that encourage and incentivise use over a tight, crowded elevator, or expanding public transport and taking advantage of fewer vehicles on the road by closing streets to traffic to encourage walking or biking that otherwise might not be safe—this will have also direct implications for chronic disease rates across the world. And by ensuring that these benefits are equitably distributed among neighbourhoods, prioritising those that historically have the least investment, land-use professionals can help close the gaps in chronic disease disparities, creating better places for all.

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Sara Hammerschmidt is a Senior Director at the Urban Land Institute, where she develops content and programs focused on the impact of the built environment on public health through the Building Healthy Places Initiative. Throughout her career, Sara has done extensive work on issues that lie at the intersection of health and the built environment. She has spoken on the topics of Health Impact Assessment, the role of urban planning in creating healthier cities, and recommendations for incorporating health into all built environment decision making at several national conferences. Sara holds an MS and PhD in Community and Regional Planning from the University of Texas at Austin, where her research focused on developing recommendations for how planning departments across the country can incorporate public health considerations into their work. She also holds a BS in Industrial Operations and Engineering from the University of Michigan.

Lessons from the Cholera in Paris and Hamburg

Franziska Plößl and Tobias Just

Abstract

Epidemics led to far-reaching changes in European cities in earlier centuries. Using Paris and Hamburg as examples, this chapter shows how the outbreak of cholera in the nineteenth century had a lasting impact on the respective cityscape. Urban planning measures, such as newly created traffic infrastructure, the construction of water filtration and sewer systems, lower occupancy of residential spaces, and the construction of sanitary facilities, led to the upgrading of buildings while triggering displacement effects in inner cities.

1 Introduction

Infectious diseases have posed major challenges to spatial and urban planning for centuries—not only, but particularly in the seventeenth and nineteenth centuries, and not just since the COVID-19 crisis. In the nineteenth century, after the outbreaks of plague, cholera, or typhus, fundamental changes transformed cities into more liveable and healthier spaces. The great poverty of medieval cities forced high population densities and poor hygienic conditions, which greatly favoured the spread of infectious diseases. Urban development in the early twentieth century brought lower occupancy rates, greater distances between buildings and sanitary infrastructure to Europe. Once again, the spread of the coronavirus is forcing urban planning to consider the hygiene of European cities (Friesecke, 2020; Roesler, 2020).

F. Plößl (✉) · T. Just
IRE|BS International Real Estate Business School, University of Regensburg, Regensburg, Germany
e-mail: franziska.ploessl@irebs.de; tobias.just@irebs.de

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2 Paris and Cholera

Infectious diseases were a major contributor to much of the deaths in European cities in earlier centuries, and this dealt a major economic damage. The adaptative reactions of a city like Paris, whose history spans over 2000 years, helps to assess how much a single infection event can contribute to urban changes. Paris also lends itself well as an analysis item because reliable real estate market data could be obtained from the city archives for 1832, even at district level, and since, unlike in 1870 (smallpox) or 1918 (Spanish flu), wars did not also cause excess mortality (Francke & Korevaar, 2021).

According to Francke and Korevaar (2021), centrally located and poorer neighbourhoods were most affected by cholera. During the outbreak in 1832, over 18,000 deaths were reported out of approx. 785,000 inhabitants; in 1849, over 15,000 out of approx. one million inhabitants (Demographia, 2021). The mortality of the cholera pandemic in Paris was thus more than 10 times higher than that of the COVID-19 pandemic in European cities. Narrow streets and the sometimes catastrophic hygienic conditions had a strong accelerating effect. Indeed, this connection was recognised as early as 1832 (Châteauneuf, 1834) and confirmed again in 1849: a large number of deaths were recorded in the working class districts, while infections in the historic old town had declined (Le Mée, 1998).

In spite of the massive excess mortality, Paris experienced a wave of immigration, which combined with the increasing agriculture productivity and falling inner-city birth rates, could not offset the labour shortage created by industrialisation (Schirmacher, 1908). In turn, this led to massively overcrowded apartments and favoured the spread of the disease (Ruckstuhl & Ryter, 2020). In response to these grievances, the residents were promised "water, air, and shade". For this purpose, among other things, the sewer system and the water distribution network were expanded, public water wells were built, and streets widened (Park, 2018). These measures paid off in the 1849 outbreak: mortality rates were particularly lower in the central districts. This also paved the way for the "Haussmannisation" of Paris—an extensive, public work programme that still shapes the urban identity and the cityscape today. Three-quarters of the inner-city buildings were rebuilt, small streets and dead ends gave way to broad lines of sight, and large apartment buildings—known today as Paris Haussmann Houses—were created to improve living conditions (Park, 2018; Ulrich, 2017).

These upgrades carried high investment costs for property owners, who were only allowed sharply rising rents if another user group moved into the new apartments. As a result, poorer classes of the population were increasingly being pushed out of downtown Paris by wealthy households (Guerrieri et al., 2013). According to calculations by Francke and Korevaar (2021), property purchase prices fell by 5.5% in the year of a (typical) epidemic with a sharp decline in transaction volume. In the following year, prices fell approx. by a further 4%. In these 2 years, rents fell about half as much as purchase prices (2.9% in the first year of the outbreak and 2.4% in the following year). On closer analysis, it becomes clear that there were different dynamics: in strongly affected city districts, house prices fell by approx. 7%

more than in less affected areas. Before the epidemic, however, purchase prices in affected districts rose significantly more, as the immigration of industrial workers mainly took place in densely populated inner-city areas. There was a similar development before and during the epidemic of 1849. Prices recovered in the decade following the epidemic (Francke & Korevaar, 2021). [1]

3 Hamburg and Cholera

Robert Koch, then Director of the Prussian Institute for Infectious Diseases in Berlin, describes the hygienic conditions in Hamburg in 1892 as follows: "Ich habe noch nie solche ungesunden Wohnungen, Pesthöhlen und Brutstätten für jeden Ansteckungskeim angetroffen wie in den sogenannten Gängevierteln (. . .). Meine Herren, ich vergesse, daß ich mich in Europa befinde!" (I have never encountered such unhealthy dwellings, plague lairs, and breeding grounds for every infection as in the so-called Gängeviertel (. . .). Gentlemen, I forget that I am in Europe!) (Stupperich, 1997).

The port city experienced several smaller cholera epidemics from 1822 until the last major outbreak in 1892 with a total of 16,596 diseases and over 8600 deaths (Klessmann, 1981)—out of a population of approx. 325,000 people (Statistisches Amt für Hamburg und Schleswig-Holstein, 2021). Initially, cases were concentrated in the densely populated poor neighbourhoods near the port before the disease spread to the entire city area. In Hamburg, too, a negative relationship was found between the disease resp. mortality and the income of citizens (Evans, 2005). This is attributed to the fact that wealthy households could boil water and sterilise their living areas, among other things, and that servants were available for errands. In some cases, there was also a lack of basic information, as poor households, in particular, could not read the notices of the city (Institut für Hygiene und Umwelt, 2009).

Around 1890, most workers lived in the city centre; the Gängeviertel described by Robert Koch was very densely populated. In households with an area of less than 10 m^2 per person, the death rate was 1.72%, whereas households with a residential space of over 50 m^2 per person saw rates around 0.96% (Wischermann, 1983). The living conditions of the working population were not only characterised by overcrowded dwellings, but also by a lack of sanitary infrastructure (Evans, 2005).

The infection route via water was suspected by Robert Koch, since the distribution area of cholera coincided with the water supply area, (Koch, 1893) and the corresponding importance of water filtration for reducing mortality was confirmed by Kesztenbaum and Rosenthal (2017) and Knutsson (2020) among others. The epidemic accelerated the completion of a sand filtration plant under construction in

[1] Aggregate influence of epidemics on house and rent prices in Paris (cholera) and Amsterdam (plague), see also the online appendix by Francke and Korevaar (2021) or Francke and Korevaar (2020).

1893, after which there was no further outbreak. This facility cost the city 22.6 million German marks, a relatively small amount compared to the economic losses caused by the epidemic, i.e. 430 million German marks (Vögele et al., 2016). Reforms also followed in the health system, including the establishment of the "Hygienic Institute", which is responsible for testing drinking water and wastewater, for disease prevention, for disinfection measures and for checking food quality (Institut für Hygiene und Umwelt, 2009).

Further regulations to improve living conditions ranged from provisions for water supply as well as air and light supply, such as a minimum area of 6 m^2 for atriums, for the structural separation of toilets to the delimitation of basement living spaces. However, this exacerbated the housing shortage because the construction of small apartments became increasingly unprofitable. In the years that followed, increasingly larger apartments were built, but only a minority of residents could afford them. To offset the ongoing housing shortage, a law to promote the construction of small apartments was passed in 1902. As a result, 10,000 small apartments had been built by 1906 (Wischermann, 1983). Following the extensive renovation measures, the cityscape fundamentally changed: instead of new residential space, some commercial and administrative buildings were built, and space was also created for a new transport infrastructure (Schubert, 2013). This also aggravated displacement effects in Hamburg: while 59% of the population still lived in the city centre in 1867, it was only 11% in 1919. At the same time, rents rose by around 35% in the 20 years up to 1912, and workers were pushed into the suburbs (Wischermann, 1983).

4 Final Remarks

The dynamics of real estate economic adaptations to the infectious diseases of the nineteenth and twenty-first centuries show some parallels as well as differences. Past epidemics show that rental and purchase prices for residential space experienced a short-term decline during and after the outbreak of an epidemic, with the latter being more severely affected. This downward trend occurred increasingly in central and socially weaker districts with high mortality rates. Within a few years, however, rents and purchase prices recovered there.

Epidemics acted as catalysts for extensive renovation programmes that shape the cityscape to this day. What is more, they created an "understanding of the connection between urban planning, hygiene and epidemiology", which gave rise to both medical and urban development innovations (Roesler, 2020). Therefore, the importance of hygiene for scientific urban planning was already evident in the 1870s from the demand for "more light and more air" for city dwellers (Rodenstein, 1992). Before the COVID-19 crisis, the question of affordable housing or sustainability goals determined urban policy issues. At present, however, these are increasingly supplemented by epidemiological questions. This created an important trade-off between the desire or need for additional open space on the one hand, and the desire for affordable residential space in a (relatively) central location on the other hand. In the earlier pandemics outlined here, this conflict often resulted in displacements,

followed by strong external growth in cities. At the same time, cities became more liveable following the upgrading.

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Franziska Plößl is a Research Assistant and doctoral candidate at the International Real Estate Business School/University of Regensburg. Franziska studied Real Estate Business (MSc) at the University of Regensburg and International Real Estate (MSc) at Florida International University, graduating at the best of her class. She has published on various topics, including CREM, nursing homes, and megatrends, in the real estate industry.

Tobias Just is a Managing Director at the IRE|BS Immobilienakademie and professor of Real Estate at the University of Regensburg. Tobias studied economics in Hamburg and Uppsala (Sweden). In 1997, he started to work at the University of the Federal Armed Forces Hamburg. His PhD dissertation was awarded the university science prize in 2001. For more than 10 years, Tobias worked at Deutsche Bank Research. He headed the unit's sector and real estate team and was a member of Deutsche Bank's group-wide Environmental Steering Committee. In 2006, Tobias was a Research Fellow at the American Institute of Contemporary German Studies at the Johns Hopkins University. Tobias published more than 200 papers in professional and academic journals and books. Until 2021 he was President of the German Society of Property Researchers and is the editor of the ZIÖ—the German Journal of Real Estate Research. In 2018, Tobias became a Fellow of the RICS by nomination.

Urban Form, Neighbourhood Governance, and Real Estate Management: Chinese Cities Fighting a Pandemic

Bing Wang and Rong Zhou

Abstract

Success in fighting a pandemic such as COVID-19 requires global collaboration. However, local leadership and efficient operations are the most critical contributing factors for saving lives and restoring urban normalcy. This chapter examines the intertwining relationship among urban form, neighbourhood governance, and the commercialised real estate management sector, and explores the dynamic impact this relationship generates on urban resilience. The chapter presents three effective urban approaches that facilitated China's efforts to fight the pandemic: the formal quality of urban form and mixed-use nature of Chinese cities contributed to urban resilience; a territorial-based institutional structure with grid management rendered accountability of urban governance and formed an effective state–society synergy with full-scale public participation; and the recently emerged commercialised real estate management sector, accompanied with technology, offered merits in curbing the spread of the virus. In summary, the various characteristics through which Chinese cities and neighbourhoods were spatially formed, administratively governed, and financially operated helped save lives and shaped resilient multi-dimensional urban environments.

1 Introduction

The breakout of COVID-19 in 2020 disrupted the normalcies of many cities and threatened the established social and economic systems worldwide. Human societies' painful experience has led many to a sobering realisation of mankind's

B. Wang (✉)
Harvard University, Graduate School of Design, Cambridge, MA, USA

R. Zhou
Tsinghua University, School of Architecture, Beijing, China

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collective vulnerabilities and fragilities of the global physical landscape. Determining how to build urban resilience in both the short and long term has become imperative as communities are forged and cities constructed. Only by reflecting which approaches and strategies have been effective in fighting the pandemic, can the impact of this crisis on the built environment be understood and learned.

Globally, some cities dealt with the pandemic better than others. As an example, despite the high population densities, compared to their counterparts in the rest of the world, most East Asian metropolises had fewer cases of infection and fatalities. China, with a population of 1.4 billion, living in the most high-density metropolises, was one of the earliest countries that cautiously and gradually resumed regular economic activities in the middle of 2020, with the majority of people returning to normal work and life.

This chapter examines some observed "urban approaches" that contributed to the Chinese cities' resilience in fighting the COVID-19 pandemic. Communities' urban forms, the structure of neighbourhood governance, and privatised real estate management all contributed to an effective mechanism in curbing virus transmission and helped safeguard cities against COVID-19 in China. While these combined urban approaches are not always easily replicable in different social and political contexts, they provide food for thought in unfolding the interactions of urban form, governance, and public–private joint efforts in times of emergency and are thus noteworthy.

The remainder of this chapter is organised as follows. Section 2 discusses how an urban form of enclosed residential communities in large Chinese cities facilitated the curbing of the virus. Section 3 illustrates the urban governance structure of local neighbourhoods. This combination of urban form and neighbourhood governance structure forms a unique urban system both spatially and institutionally in Chinese cities. Section 4 focuses on the increased privatisation of real estate property management, together with the utilisation of a recent tech-enabled tracking system, to help prevent the spread of disease. Section 5 summarises the chapter.

2 Urban Form: Enclosed Residential Communities and Mixed-Used Neighbourhoods

Before the pandemic, enclosed and gated communities were a controversial subject in China. These communities, as an urban typology popular in most contemporary Chinese cities, are generally residential areas surrounded by walls, fences, or green hedges, and often have staff guarding the community gates, making it difficult for outsiders to enter (Wang & Pojani, 2020). While this urban neighbourhood typology traces its historic lineage to traditional enclosed Chinese courtyard housing typology and work-unit residential compounds built in the 1950s and 1960s, today's enclosed gated communities appeal to the middle- and upper-income strata of urban residents due to their safer, cleaner, and more controlled environment that is closed to outsiders. Since the 1990s, most newly built large-scale residential communities in Chinese cities, especially those of the first- and second-tier cities, have been gated

communities. The physical scales of these communities are usually large, containing 2000–3000 households (Wang & Pojani, 2020).

Often dubbed as a "sealed residential quarter or neighbourhood", this type of residential development became the subject of heated nationwide public debate in 2016, when the Central Government's City Work Conference issued a document calling for an end to gated communities and suggested the possibility of "opening up" existing gated communities by tearing down the walls and fences surrounding them. Although the intention of the document was to ease the spatial fragmentation of the urban fabric, reduce the resultant traffic congestion, and introduce a more open and vibrant physical urban environment in Chinese cities, it triggered a public outcry from the residents of these communities nationwide. As this working document never became an official directive, the lingering tension between the government and residents of middle-class communities regarding the form of gated communities was promptly ended—unexpectedly and fully as a by-product—by the emergence of COVID-19, when the pandemic presented otherwise unrealizable merits regarding the spatial arrangement of enclosed community in fighting the pandemic and establishing urban resilience.

The most evident merit of a gated residential community in controlling a human-transmitted disease such as COVID-19 lies in its inward spatial orientation, facilitated by restricted access. The gates, walls, fences, and hedges help embark a clear physical boundary between the community and its outside urban environment. With only a limited number of gates as entrances, enclosed communities can easily reinforce their restricted access, with checks of vehicles and pedestrians entering the community. During the pandemic, the usual check of identification at the community gates expanded to include checks and measuring of body temperatures for people who intended to enter the communities. Especially after the initiation of using a contact-tracing application on mobile phones, any non-resident who had a fever or did not present an effective "green code"[1] on one's mobile phone was denied entry to the communities; meanwhile, residents who presented a "yellow code" were required to quarantine at home without stepping out of individual units. This separation of community residents from the otherwise chaotic and bustling urban environment localised the tracing of the virus, curbed unnecessary population flows, and weakened the transmission of the virus.

In addition, within the community, the often one-directional vehicular circulation system and pedestrian pathways that lead to separated building entrances also facilitate the spatial management of human circulation, largely helping to reinforce the necessary social distance. In the pandemic environment, the separation of communities from the urban context, which is usually the heart of the critique of gated communities, provided a layer of protection and constituted a "middle ground"

[1] A green code gave users unhindered access to public spaces, a yellow code indicated that the person might have come into contact with a person with a COVID-19 infection and therefore had to be confined to their homes or an isolation facility, and a red code was assigned to users infected with the virus.

between the privacy of individual residences and the publicness of urbanity. The communities' outdoor spaces, often lushly landscaped within the walls, also offered residents an enclave, both physical and psychological, and a place for an open air and outdoor environment in their daily lives during the pandemic.

Chinese cities' mixed-use-oriented land use pattern and associated urban form were also conducive to curbing the virus transmission. This urban pattern of mixed use seems to be mostly aligned with the concept of the "15-minute city", popularised by the Mayor of Paris, Anne Hidalgo, in 2020 after the breakout of COVID-19 (O'Sullivan & Bliss, 2020). For most Chinese metropolises, the old urban fabric was inherited from the pre-1990 eras, when private cars were not a popular transportation means and urban planning focused mostly on walkable neighborhoods as basic urban units (Wang, 2010). Most everyday essential needs for human beings—education, shopping, leisure, health, and culture—are located within a 15–20-min walk of residents' doorsteps.

Even in today's large-scale gated community developments in Chinese cities, the planning authority often requires developers to include, based on the number of residents, kindergartens, elementary schools, and even middle schools, as well as community-based retail, such as convenience stores, small groceries, and neighbourhood restaurants, as part of the overall residential community development. During the pandemic, this pattern of a mixed-use neighbourhood helped reduce the need for cross-city travels and localise the flow of population. The pandemic also helped alter, to some degree, society's perceptions regarding the recent development of new towns and suburbanisation based on urban sprawl, where car-based planning and lifestyle dominate. Urban regeneration, focusing on improving the design and construction quality of existing urban conditions and generating unique urban experiences, became widely embraced in China since returning to the regular post-COVID-19 life, contrary to the trend of the exodus to suburbs seen in the United States, as temporary as it might be (Wang, 2017; Wang & Roulac, 2020).

3 Urban Governance and Grid-Based Management

In addition to the urban form, the institutional structure of urban neighbourhoods in Chinese cities was also conducive to the localised management of virus transmission. In traditional East Asian culture, family is the basic cell of society, and collectivism serves as the root of mass cohesion. In China's remote countryside, this collectivism, in addition to family, was centred around a clan structure prior to the 1940s, communes from the 1950s to the 1970s, and a village organisation in recent decades. In urban China, before the 1980s, work units, together with neighbourhood organisations, functioned as embodiments of urban collectivism, forming institutionalised urban governance structures.

More recently, however, as the privatisation of the economy became the engine of productivity in Chinese society (Wang, 2021), neighbourhood organisations have remained the only dominant urban governance and administrative units in

established territorial-based social networks in Chinese cities. Neighbourhood organisations have two different forms: Street Offices and Residents Committees, both of which form the fundamental level of urban governance in all Chinese cities, with Street Offices bearing higher administrative status, directing and assisting Residents Committees in their organisation and institution building. For cities with a population between 50,000 and 100,000, Street Offices and Residents Committees do not have political voting rights and, thus, are not officially a level of government, holding only neighbourhood administrative functions (Wu, 2002).

The prevalent Street Offices and Residents Committees acted as a fundamental structure for the grid-based administrative management during the pandemic. After the initial chaos, confusion, and uncertainty about whether the COVID-19 virus was transmittable from person to person, on January 25, 2020, the Chinese central authorities established the Central Leading Group for COVID-19 Prevention and Control as the top decision-making governance body in response to the pandemic (He et al., 2020). Since then, in many cities, in addition to the establishment of the highest-level public health emergency response mechanism, corresponding governance teams have been put in place to be responsible for the management of pandemic-related administrative matters and to emergent incidences in a timely manner. In most cities, this governance team included representatives from municipal and district governments, neighbourhoods, the Residents Committee, and the Street Office, forming an effective vertical management chain and a decision-making system focused on public health throughout China (Wei et al., 2020). Specific personnel at each governance level were designated to respond to the pandemic prevention and control efforts according to geographic locations and territorial scopes. In addition, many Residents Committees' jurisdictions were further divided into smaller "grids" based on geographic information system (GIS) mapping, with each grid comprising a few residential buildings of 300–500 households (Wei et al., 2020). Communities and neighbourhoods thus became the cornerstone of urban governance for the prevention of COVID-19, and Street Offices and Residents Committees functioned as a grassroots link between individual households and various levels of government jurisdictions, helping to carry out activities such as managing residents' COVID-19 tests, monitoring in-house quarantine, and collecting community information. Street Offices and Residents Committees acted as the location-based activists and key executors in the launch of a public health response system and sponsored full public participation in fighting the pandemic.

The grid-based management system was effective in the control and prevention of COVID-19. Each grid, based on community blocks, also had an identified neighbourhood team, consisting of representatives from district governments, Street Offices, Residents Committees, volunteers, and homeowner associations as well as property management companies (Zhang et al., 2020). The grid members were responsible for cleaning and disinfecting high-risk public places that remained accessible, such as corridors and elevators, within assigned residential neighbourhoods, twice a day, to help prevent the spread of COVID-19. They were also in charge of collecting data on a daily basis through phone calls, video calls, text messages, etc. Such data included contact history over the past 14 days of those

within their grids who had tested positive for COVID, the number of suspected cases, diagnosis results and cleared cases/deaths, and symptoms and general health conditions of those under home quarantine. Personnel also delivered daily food for home quarantine residents, such as eggs, meat, rice, and vegetables, without making physical contact (Wei et al., 2020). More importantly, when emergencies arose, the grid-based team helped people communicate with possible public facilities and government resources.

The 2020 pandemic became a test case for the effectiveness of the urban governance structure and grid-based emergency management system in China. This effectiveness was based on joint efforts of multiple players, including government agencies, local volunteers, neighbourhood activists, and private enterprises responsible for property management.

4 Privatised Professional Real Estate Property Management and Applications of Technology

Another critical players in the control and management of virus transmission in China are the privatised real estate property managers. The property management's increasingly important role in maintaining an environment less prone to virus transmission has often been ignored by many who often pay less attention to the vitality of privatised enterprises in China's economy and society.

The first privatised real estate property management company in China was formed in 1981 in Shenzhen. In 1994, the pronouncement of the *Administrative Measures for Property Managements of Newly Built Urban Residential Communities* by the Ministry of Construction initiated the first step toward legalisation for this sector. Thereafter, this subsector of the real estate industry underwent a process of rapid growth, accompanied by the process of professionalisation and localised legalisation. In 2003, the State Council promulgated Order No. 379 *The Property Management Regulations*, marking the nationwide legalisation of the property management industry (Yuan, 2019). The expansion of commercial real estate led by China's rapid urbanisation during the past four decades has provided an unprecedented market for the property management business. By the end of 2020, the total real estate value under professionalised property management in overall China had reached 1 trillion RMB (equivalent to 130.73 billion euros),[2] accounting for less than half of the market (Zhao, 2020).

The potential of this sector has largely attracted private equity investors and capital markets. In 2020 alone, 20 property management companies became publicly listed companies on the Hong Kong, Shanghai, or Shenzhen stock exchanges. The backup of capital markets in the sector increased its pace of consolidation and generated a fierce competition for market shares (Wang & Just, 2021). Accordingly, under the scrutiny of capital markets and investors, these publicly listed companies

[2]The conversion rate used was 7.65 Chinese renminbi (RMB) to 1 euro (EUR).

accelerated their pace toward standardisation of services and improved the overall qualities of real estate property managements. The breakout of COVID-19 provided a testing ground for the improved quality of services by property management companies and offered an opportunity for their penetration of the market. In addition to the conventional services provided by property management companies, including maintaining security, the cleanliness of public spaces, and the greenness of landscapes, the so-called value-added services that go beyond traditional property management became increasingly available (Wong, 2021), including individual household cleaning, babysitting, or elderly care within the community, for example.

Soon after the public lockdown in China, the real estate property management industry fully affirmed its important role in the battle against the pandemic, with key representatives putting forward the principle with widespread slogans such as "*The front line of virus treatment is medical treatment, and the front line of epidemic prevention is property management*". Thirty-three of the top 100 property management companies, managing more than 2.5 billion m^2 of real estate located in nearly 400 cities and 31 provinces throughout China, jointly established a research group and launched the comprehensive *Epidemic Prevention Guidelines for China's Property Management Industry* for both residential and commercial (mainly office) properties. The guidelines were widely adopted in the industry and included details on how to establish an inspecting and reporting system within the property management companies, how to formulate and implement prevention and control plans for communities, how to uniformly deploy resources in responding to emergency situations with regard to virus spreading, and how to implement the disinfection management of daily public areas of the community and contact points of residents or office tenants.

Throughout the lockdown and even today, as regular economic and social activities have largely returned to Chinese cities, professional property management companies have continued to perform critical tasks in helping neighborhoods prevent and control the spread of the virus through their daily acts. Many of the real estate management services continue to include actions such as compiling and delivering a daily community disinfection report, publishing authoritative epidemic information, and listing prevention and control measures through platforms such as corporate official accounts, community WeChat[3] groups, and APP bulletin boards, at least once a day. The property management companies continue offering 24-h monitoring of people entering communities through identity, temperature, and health declaration record checks. Most communities have set up unified mail and parcel delivery points and allocated property managers to supervise and manage them at designated points, so residents (or tenants, if office properties) can pick up items at differentiated time periods to avoid in-person encounters. In addition to basic

[3] WeChat is the most popular multipurpose mobile social platform in China. Developed by Tencent, WeChat combines into one platform many functions available on Facebook, Twitter, and LinkedIn, including messaging, social media, online phone communication, and mobile payment app. First released in 2011, WeChat became the world's largest stand-alone mobile app in 2018 with more than one billion active users.

disinfection, property management services have also provided many communities with innovative new protection methods, such as setting up disinfection passages or shoe soles and wheel disinfection carpets at pedestrian and vehicle entrances. In some communities, residents could choose to have daily grocery necessities delivered to their door by property management personnel who wore face masks and gloves and were tested for the virus twice a week.

Property management companies were also critical in facilitating the return to in-person work in offices in China. Property companies set up a special epidemic prevention team to conduct unified epidemic prevention training for service personnel. Those who did not perform their duties in the epidemic prevention and control work according to guidelines or caused epidemic harm were held accountable. Property management offices strictly controlled entry into parking lots and monitored the body temperature of all car personnel entering the garage. The high-frequency disinfection of public areas was conducted in office lobbies, inside and outside elevators, floor washrooms, central air conditioning systems in public areas, and parking lots where vehicle parking areas and main roads were disinfected. Many more detailed services were provided by these professional property management companies in order to facilitate the return to offices, which helped with the timely resumption of regular economic activities in China.

Indeed, one unique difference in terms of fighting the COVID-19 pandemic versus severe acute respiratory syndrome (SARS) 18 years ago in China was the additional role played by the commercialised real estate management sector, most of which operated in the form of publicly listed companies and were supported by institutional capital investments. Even though similar measures, such as isolation of patients, tracing and quarantine of close contacts of the infected, and large-scale information dissemination, including timely reporting of the status of the epidemic and scientific guidance on prevention control, were partial of effective measures utilised in overcoming SARS, back in 2002 and 2003, however, this active privatised real estate sector was nearly absent in the market. The involvement and detailed facilitation by the real estate management sector in a time of crisis were thus unprecedented in China. Given the country's expansion of the middle class and continued urbanisation, the vitality and business potential of this sector within the real estate industry are promising. In particular, with the backup of capital markets, the ongoing consolidation of the industry may help drive growth through economies of scale or improve pricing power even if new home sales slowdown (Wong, 2021).

Lastly, technology is another key factor that helped the government and privatised property management prevent and control the transmission of the virus. The strategies focusing on early surveillance, testing, contact tracing, and strict quarantine all involved technology application. Among them, real-time tracking, live updates of various online databases, and timely reporting and distribution of scientific information were critical.

The increased availability and use of technology during the pandemic enabled governments to develop critical COVID-19-tracking infrastructure. As of January 2021, a total of 49 contract-tracing apps (CTAs) were being used in 48 different countries, and China was the first country to use CTAs as a means to curb the spread

of the virus. In February 2020, China rolled out its "health code" app nationwide to identify those who had COVID-19 symptoms and trace their movements. Each registered user of a valid mobile phone was assigned a real-time health code—a red, yellow, or green QR code on one's phone. The government collected information through mobile phone data, including user location, recent contacts, self-reported health status, and travel history (Kostka, 2021). Although the use of the app was criticised due to privacy concerns, it was also espoused by many for identifying people with COVID-19 symptoms and as an effective tool to safeguard public health.

Technology also facilitated governmental efforts through enhancement of public health education and communication channels. Since February 2020, healthcare agencies have used multiple social media platforms to provide real-time updates and clarify uncertainties with the public. On a smaller scale, many communities adopted facial recognition technologies including thermal imaging at the community entrance gate to identify people with elevated temperatures (Ting et al., 2020). The application of smart technology and management was widely implemented, including technologies that were used as intelligent electronic access control systems to allow residents or tenants to enter buildings without touching any objects; the intelligent supply and distribution of fresh food, daily consumables, and other materials via e-commerce; and the reasonable deployment of community medical resources, online consultation by medical teams, and attention to sickness within the community.

The pandemic not only created an unexpected context for coordination and data management at both the community and the national scales, but also provided an opportunity for the effective implementation of strategies aimed at adopting contemporary digital technology and integrating it with public policy and the health care systems.

5 Summary

The 2020 pandemic devastated many aspects of daily life on a global scale. This chapter examined the interplay among the urban physical form, neighbourhood governance structure, and privatised real estate property management in helping Chinese cities fight the outbreak.

The complexity of urban life and the urban environment can never be understood from a single dimension. How it was spatially formed, administratively governed, and financially operated all intertwined on a daily basis to shape lives and tell vivid stories, becoming part of the historic imprints. The story of COVID-19 is a tragic one, with many lives lost; the prevailing political divides, social isolation, and economic inequity dominated those dark days. However, within this tragic unfolding, optimism, leadership, and collective efforts to fight the virus emerged, striving for a better tomorrow. Among all the emotional currents, it is important to reflect on what human society went through collectively and learn from the pains and gains that have occurred.

This chapter has discussed several important points. The criteria for assessing the quality of the urban form are never static. While enclosed urban communities were controversial in China and criticised for their isolation from the urban fabric, they presented formal merits by being resilient to the transmission of the virus due to inward orientation and manageable size as an urban unit.

Especially in the Chinese context, where mixed-use has long been an urban characteristic inherited from a pedestrian-oriented era when cars were not popular, various life necessities and functions can easily be met by walking 15–20 min from home, thus localising population flow and helping curtail spread of the virus. The government's call to "open-up" the gated communities before the pandemic was non-consequential due to the strong opposition from residents; now after the experience of the pandemic, this form of urban community may very likely continue to gain further support from residents.

Another aspect that contributed to Chinese cities' effectiveness in fighting the pandemic is their territorial-based institutional structure facilitated with grid management. Within the government bureaucracy, it formed a linear vertical management system that rendered accountability. However, more importantly, the cooperative efforts among local government agencies, the privatised business of real estate management companies, volunteers, and communities' representatives helped people prevent infection and control the virus. This cooperative relationship formed an unexpected "state-society synergy" in the context of fighting the pandemic and fostered a backdrop that supported full-scale public participation at the most needed time. Further research is needed to explore whether this synergy could be constructed in the short term in a time of crisis or whether it requires historically deep institutional and normative foundations (Evans, 1996).

The use of technology, while effective, also probably constitutes the most problematic element in fighting the pandemic in Chinese cities. The pandemic provided a context for some artificial intelligence technologies to be tested nationwide, and quite a few of them were put in use for the first time at such a large scale. Their usefulness in constructing a public health network was validated, but there are also grey areas involved, especially in terms of what private information can be collected and what cannot, as well as how to regulate the use of such data (Wang, 2019).

Briefly speaking, while the virus is still not fully controlled globally, humanity cannot yet claim victory. For Chinese cities fighting against an insidious virus, a combination of the prevalent physical urban form of enclosed gated communities, the territorialised urban governance system through the organization of local neighbourhood committees with grid management, and the more recently emerged commercialised property management sector accompanied with technology, all contributed to the comparatively effective curtailing of the spread of the virus. Individual and collective reflections help society learn from hard-fought gains and also tragic failures, all for the purpose of building a better city in the future—a more resilient and adaptive city.

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Bing Wang is an Associate Professor in Practice of Real Estate and the Built Environment at Harvard University GSD. She is Faculty Co-Chair for the Real Estate Management executive program between Harvard Business School and Harvard GSD, and directs GSD's advanced education activities for senior real estate executives, i.e., Advanced Management Development Program. Wang obtained her doctorate and master's degrees from Harvard University and her B.Arch. from Tsinghua University. She bridges the fields of real estate and design. Wang worked as an investment advisor for Lehman Brothers, and founded an architecture studio, and two private equity real estate firms, with Citigroup, Starwood Capital, Cargill, and Rockpoint as institutional shareholders. Her publications include more than 30 articles, journal papers and book chapters. Her published books include *Understanding China's Real Estate Markets: Development, Finance, and Investment* (2021), *The Architectural Profession of Modern China* (2011), *Prestige Retail Design and Development* (2014), and *Global Leadership in Real Estate and Design* (2015). She is an editorial board member of the Journal of Sustainable Real Estate (US), Journal of Planning Theory and Practice (UK), Encyclopedia of Ecological Culture (China) and the German Research on Real Estate (Germany). Wang is on the Steering Committee of Harvard China Fund, and is an elected Board Director of the American Real Estate Society.

Rong Zhou is a distinguished scholar, critic, and curator of Chinese contemporary architecture, urbanization, and public art. He is an Associate Professor at the School of Architecture at Tsinghua University. He completed his PhD at Tsinghua and obtained his Master of design degree from the Harvard University Graduate School of Design (GSD). Rong is vice president at the urban design and innovation academy of the Central Academy of Fine Arts in Beijing, a distinguished visiting professor at Visual Art Innovation Institute, an associate editor at World Architecture, an editorial board member of several international and domestic professional media, and a founder of original We-media World Knowledge LeiFeng and founder of Sanlian Lifeweek Magazine Humanistic City Award.

How COVID-19 Is Changing Mobility Behaviour and What that Means for Sustainable Urban Transport

Julia Jarass, Julia Schuppan, and Kerstin Stark

Abstract

The COVID-19 pandemic has drastically changed mobility behaviour. Many commuters have been reduced due to the restrictions in everyday life, public transport has been avoided as a common means of transport and instead there has been a shift to private cars and walking and cycling. This article first analyses the developments and impacts of the pandemic on mobility in terms of public transport, car use and active mobility. The article then shows which new approaches can be taken by transport policy and administration to adapt to the crisis. It presents innovative measures that some cities have implemented during the pandemic to encourage resilient and healthy mobility. Finally, specific ideas are concluded on how the pandemic can be used as an opportunity for sustainable urban mobility.

1 Introduction

Everyday life has changed drastically as a result of the COVID-19 pandemic, and therefore, mobility behaviour has as well. Due to the restrictions in public life, the relocation to working from home as far as possible, and the requirement to reduce contact with other people as much as possible, the movements of the population have, on the one hand, significantly decreased, and yet, on the other hand, private transport—in particular, bicycles and private vehicles—have experienced an upswing. The pandemic is a stress test for transport policy and management and also for mobility providers. The challenges include decreasing passenger numbers and declines in revenues from local public transport, the prospect of increased car

J. Jarass (✉) · J. Schuppan · K. Stark
Institut für Verkehrsforschung, Deutsches Zentrum für Luft- und Raumfahrt e.V., Berlin, Germany
e-mail: Julia.jarass@dlr.de; Julia.schuppan@dlr.de; kerstin.stark@dlr.de

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use with negative consequences for achieving transport and climate targets, the challenge of creating alternatives to local public transport and the use of private cars, and also opportunities for pandemic-friendly encounters in public spaces.

In response to these challenges, the transport infrastructures in many cities were also adapted in the spring/summer of 2020 with the aid of provisional measures to cope with the increased demand for bicycle use. Pop-up infrastructures set up at short notice—not only in Germany—have changed the appearance of some cities within a short period of time. However, the redesigns were often only implemented selectively. This raises the question of what importance the pandemic will have for sustainable transport in cities in the future. Could mobility routines be overcome and sustainable mobility behaviour such as walking and cycling and flexible mobility solutions such as combining cycling and public transport be anchored in everyday life through digital services? To what extent is the use of public transport declining, and how can reactivation be achieved? And what value has been placed on one's own car during the time of the pandemic, and what tendency can be deduced for this? The specific question that presents itself is whether the encouragement of sustainable and healthy mobility and the reduction of motorised individual transport in cities will be strengthened or possibly paused by the pandemic, and thus whether a turning point in urban planning can be seen.

Data is already available on the change in mobility behaviour caused by COVID-19, but there are only a few small-scale studies at the city level. The following text, therefore, tries to focus on cities, while at the same time revealing more general trends. Statements are also made on private transport. An overall assessment of the sustainability of transport in cities is therefore not possible because, for example delivery traffic is excluded in what follows.

2 Less Mobility: A Shift in the Use of Transport

A non-representative sample based on mobility tracking information shows that during the first lockdown in spring 2020, the daily distances covered decreased significantly, although the time spent travelling did not decrease to the same extent (infas & MotionTag, 2020). This is also due to a shift in the use of transport: public transport, in particular, i.e. buses and trains, is being almost completely avoided by people. By contrast, the use of active means of transport and private cars is gaining ground (infas & MotionTag, 2020). A study by the German Aerospace Centre (DLR) also confirms this dynamic for metropolises and large cities in Germany (see Fig. 1). This outlines the modal types, which are based on the general categorisation of the various means of transport in terms of frequency of use.

Compared to the time before the first lockdown, the proportion of car drivers and cyclists increased significantly, whereas the proportion of users of public transport—both in its pure form and mixed with other modes of transport—decreased significantly. However, this effect weakened over the summer and autumn: the demand for transport increased again, and the distances covered on foot and by bike decreased (WZB, 2020).

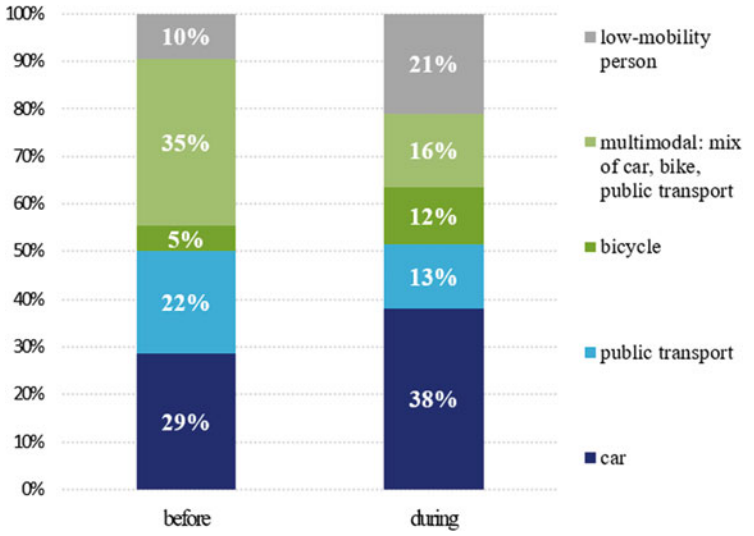

Fig. 1 Mobility types (based on the general frequency of use of the means of transport) before and during the first lockdown in spring 2020 in metropolitan areas and large cities. Notes: $n = 367$; own analysis of the data from the DLR study on mobility and the coronavirus (DLR-Verkehr, 2020)

3 Public Transport in Cities: The Big Loser of the Crisis?

Public transport is often described as the backbone of the transport transformation: in pre-pandemic times, it carried 30 million people across Germany each day (VDV, 2021a, 2021b). According to figures from the VDV (Association of German Transport Companies), an additional 86.5 billion kilometres would be travelled by car over the course of a year if passengers switched away from public transport (VDV, 2021a, 2021b). Even before the pandemic, public transport was under pressure: depending on the subsidies and the budget situation of the municipalities in question, it was already underfunded in many of them, and what was on offer was limited. Added to this is the challenge posed by new mobility providers who are threatening to take portions of business away from traditional public transport and over to their flexible offers (Stark et al., 2019). The discussion is, therefore, about how flexible mobility offers can be integrated into traditional means of public transport and how public transport can be made more attractive overall.

The pandemic is further exacerbating the situation for public transport. Over the course of the pandemic so far, according to information provided by the transport companies, the number of passengers using long-distance and local public transport has decreased by up to 80%, and an overall loss of 7 billion euros is expected for 2020 and 2021 (VDV, 2021a, 2021b). The exact numbers vary by source and by city, but, in general, declines can be seen as a function of the imposition and relaxation of measures to control the pandemic.

The decrease in passenger numbers is related to various influencing factors: the increased tendency to work from home, for example, means that regular commutes that many employees would otherwise take with local public transport are no longer being made. In addition, restaurants and cultural institutions are closed, making many routes that would otherwise be undertaken for leisure purposes redundant. Overall, there is a decreasing demand for transport across all modes of transport (COVID-19 Mobility Project, 2021; Nobis et al., 2020). Not only has the number of routes decreased, but also their length. People were and are increasingly on the move in their immediate vicinity, because the activities that remained despite the restrictions, e.g. shopping or going for a walk, can also be done on foot or by bike. This is suggested by surveys (Nobis, 2021) and studies based on movement data (COVID-19 Mobility Project, 2021; infas et al., 2020; WZB, 2020). Overall, it can be concluded that there are fewer reasons to use public transport.

Another factor influencing the decline in passenger numbers is the decreased level of acceptance of public transport and a reduced willingness to use it. The requirement to practise *social distancing* conflicts with highly utilised buses and trains, which is the reality, especially at peak times. There is concern about an increased risk of infection. While overcrowded buses and trains were uncomfortable even before the pandemic, the feeling of discomfort has now increased for many (Nobis et al., 2020). The requirement to wear a mask in local public transport, which was introduced at an early stage, is intended to counter the fear of infection, and yet, despite increased controls, there are criticisms when it comes to widespread compliance (Nobis, 2021). The extent to which the risk of infection in local public transport is actually intrinsically higher, or is increased compared to other possible locations, has not yet been conclusively investigated. Nevertheless, there are persuasive indications that this is not the case, especially from studies on the dispersion of aerosols (DB Systemtechnik GmbH & DLR, 2020; Kriegel et al., 2020). Nonetheless, the risk is often perceived as increased, and commutes in public transport are therefore avoided (WZB, 2020). One attempt to restore confidence in the safety of local public transport through communication is the *#BesserWeiter* (#BetterFurther) campaign from the Association of German Transport Companies (VDV), which focuses on compliance with the mask mandate. Further measures taken by the political sphere and transport companies relate to reducing the occupancy rates in the individual vehicles through increased service frequencies, as well as making the mask mandate more stringent by requiring medical masks instead of everyday masks. The extent to which such measures do not actually rather reinforce the impression that local public transport is to be regarded as a particular source of infection remains to be seen.

On top of the concern that public transport could lose its role in the transport transformation, there are also possible social consequences if fewer and fewer people use public transport. At least in large cities, public transport in Germany could previously be described as a democratic means of transport, because people from different social classes come together. As studies show, that has changed since the beginning of the pandemic. In some cases, people with low incomes are even using

public transport more, while the proportion of people with middle and higher incomes among those using public transport is decreasing (WZB, 2020). There are thus some indications that it is particularly those people who have no alternatives which are continuing to use public transport. One speaks of "captive transit riders" or the "transit dependent", who, usually for financial reasons, have no choice but to travel by public transport. By contrast, the beneficiaries of the decline in passenger numbers are private means of transport: bicycles, but, above all, private cars (Nobis, 2021; WZB, 2020).

However, this adverse development could also be offset by opportunities for public transport if the crisis is used as a chance for transformation and change. Even without a pandemic, overcrowding at peak times, insufficient cleanliness of the vehicles and poor networking of various mobility offers make public transport less attractive. Even before the pandemic, the elimination of the typical problems of public transport was on the agenda of many transport companies. This was to be done by means of intermodal offers in mobility stations and comprehensive booking systems, through the use of future technologies such as automation, and by adding flexible and needs-based offers. During the pandemic, we are now seeing approaches to solutions and opportunities in relation to the problem of demand-oriented capacity management, for the expansion of e-ticketing, and for tariff models that are more in line with demand. We know from some cities that transport companies measure the occupancy rates in their vehicles and use this data as the basis for planning services (e.g. in Berlin or Bremen). Deutsche Bahn is also increasingly using occupancy rate measurement and communication to provide customers with a basis on which to make decisions about which train connections to use. In summary, there are opportunities for public transport in times of increased digitalisation through data-supported planning of offers based on the genuine demand for transport, which can thus better avoid overcrowding, as well as due to greater awareness of the needs and requirements of passengers.

4 Increase in Car Use as a Retreat into the Private Sphere

At the beginning of the pandemic and during the onset of lockdown in March 2020, the number of trips made generally decreased by around 40% (Schlosser et al., 2020). The relocation to working from home, regulations on short-time working and a lack of orders coming in for business people drastically reduced commuter trips as well as car use, which accounts for the dominant share of these (Nobis & Kuhnimhof, 2018). As a result, in dense urban areas, we briefly experienced the noticeable effects that reduced car traffic in terms of better urban air and lower noise emissions: even in just the first 2 weeks of the lockdown, lower particulate matter levels in the air led to fewer premature deaths and less asthma in children (MPG, 2020); streets not being driven on were spontaneously used by pedestrians, and the quality of life in the city rose for a moment during the first lockdown.

By the start of June, mobility was already at pre-lockdown levels, but a change in the types of routes can be determined (Schlosser et al., 2020). For example, fewer

long distances were being covered, and the average distance travelled per person was around a third less than the value in 2017 (WZB, 2020; Schlosser et al., 2020). The resulting increase in local mobility also shifted over to the car, and so its use experienced a strong upswing in the COVID-19 autumn of 2020. In October 2020 alone, 55% of all trips were made by car—compared to 49% in October 2017 (WZB, 2020). The reduction in the proportion of fellow passengers from 8 to 6%, and thus the reverse trend towards sole rather than shared car use (ibid.), is of particular importance. Even the initial sharp collapse in bookings for car sharing trips was able to be mostly recovered, with levels returning to around 90% of the previous year's figure by as early as mid-June 2020 (mobility institute berlin & SHARE NOW, 2020).

The increased use of cars benefits from the avoidance of public transport and the change in reasons for travelling even more than the increased proportion of bicycles does. In the autumn of 2020, 41% of former bus and train users switched to private cars (WZB, 2020). The users mainly differ in terms of their socio-economic status, because this switch is predominantly made by people with middle and higher incomes (WZB, 2020). This means that the proportion of people with low incomes on buses and trains is increasing. This development is accompanied by possible correlations between individual degrees of accessibility and equity in relation to participation on a social level. The goal of a transport transformation that encompasses all social classes is therefore increasingly in question.

Overall, fewer new cars were sold worldwide during the coronavirus pandemic. At the same time, it can be seen that after the easing of restrictions in December 2020, an increase in new registrations was reported compared to December of the previous year (German Federal Motor Transport Authority, 2021). This suggests that sales figures are recovering quickly. The proportion of households that bought a vehicle for the first time is presumably high. This is because, due to the pandemic, around a third of people in households without a car regret not having their own vehicle, and 6% plan to buy one due to the pandemic (Nobis et al., 2020). 45% of people considering buying a private car are under the age of 35, and, of these, 79% have never owned one before (Capgemini Research Institute, 2020)—thus exactly the age group that was previously convinced that there was no need to own a car, since car sharing gives them access to vehicles of any size, regardless of time and location.

The problem: once a car is privately owned, additional trips are encouraged, and the likelihood of increased negative externalities increases (Nobis & Kuhnimhof, 2018). The higher usage levels potentially lead to the consolidation of car usage routines that are difficult to reverse by means of another mode of transport. It turns out that the higher levels of car usage mainly arise due to a variation of already existing mobility routines. For example those who were originally multimodal transport users—that is, people who use several means of transport in their everyday lives—have become monomodal transport users during the COVID-19 crisis and are primarily resorting to the car (Nobis, 2021).

There are many conceivable reasons for increased car use during the pandemic. Firstly, the emotions towards people's own vehicles have changed; even just among

those without a private car, 32% regret not having one (Nobis et al., 2020). The car seems to be the mode of transport that offers advantages that are subjectively assessed as being important, such as better observance of social distancing and hygiene, as well as health factors that are not possible in public and shared means of transport. While the argument formerly made was in favour of a sensible transport transformation and a reduction of ineffective solo trips, this is turning into a perceived advantage in pandemic times. The automotive industry can also pick up on this and emphasise the health and wellness features of vehicles, offer flexible payment and financing options for people in uncertain economic situations, and advertise "green cars" for the environmentally conscious younger target group, thus addressing societal change (Capgemini Research Institute, 2020). Secondly, in addition to the goal of flexible mobility, the car also fulfils needs that have been pushed to the fore due to the pandemic. The car is becoming a place for retreat into a private space that offers solitude, relaxation, and also protection and safety from noise and emissions, viruses and heat. Thirdly, the effects of new levels of time flexibility in terms of working hours and places of work as a result of increased opportunities to work from home and for teleworking are having an effect on the temporal concentration of inner-city traffic during morning and afternoon peaks. The greater temporal distribution of people driving cars in the city increases the convenience of driving due to reduced congestion and the stress-free search for a parking space. Fourthly, the moral pressure associated with an environmental transport transformation to have to justify personal car use is increasingly disappearing. This is also supported by recommendations made by politicians and administrative regulations for business travel rules in favour of cars and against buses and trains.

For many people, their own vehicle has become a (once again) increasingly used means of transport as a result of the pandemic, including for local mobility. Car-focused everyday routines seem to be solidifying (DLR, 2020). This endangers long-term goals of the transport transformation.

5 Active Mobility: Resilient in Crises and in the Future for Sustainable Mobility

Cycling and walking have experienced an upswing during the pandemic. The Institute for Applied Social Sciences, for example used mobility tracking to determine that trips on foot and by bike increased in April 2020. The time spent on foot and by bike has risen from less than 20 min a day to an average of 25 min a day (infas & Motiontag, 2020). Both modes of transport are undertaken in the fresh air, making the risk of infection low—this is also because the distance to other transport users is maintained. Regular exercise also promotes health and strengthens the immune system (WHO, 2010).

Experience from cities around the world shows that cycling and walking have increased, even if fewer trips have been made overall due to restrictions in public life. Since private meetings in the fresh air are safer, this is often combined with a walk. According to an ADAC (General German Automobile Club) survey in 2020

on the classification of the risk of infection entailed by different activities, going for a walk was perceived by far as the activity with the lowest potential for infection. 75% of respondents ($n = 2061$) do not see any great risk (at all) of getting infected while walking, whereas around half of respondents consider the use of public transport, for example to pose a (very) high risk (ADAC, 2020).

5.1 Active Mobility as Resilient Mobility

Active mobility is a resilient form of mobility and represents the baseline of mobility. It is easy to implement, inexpensive and, in an emergency, does not require any infrastructure. This is particularly evident in the wake of crises or natural disasters. After the severe earthquakes in Japan in 2011 and Mexico City in 2017, for example the bicycle experienced an upswing, since, for many commuters, this became the fastest and most flexible means of transport on partially destroyed roads and given impaired rail networks (e.g. New York Times, 2011). The oil crisis of the 1970s led to restrictions in motorised transport, and so, again, the bicycle became popular as a resilient mode of transport (Klein et al., 2020). Active mobility is also gaining in importance during the COVID-19 crisis. This can partly be explained by the fact that mobility is more closely related to one's immediate living environment, and longer routes—such as routes to work and trips for leisure—are no longer being made.

5.2 Excursus: Bicycle Traffic During the COVID-19 Pandemic in Berlin

The bicycle traffic counting stations that are distributed over small areas in Berlin make it possible to gain a view of bicycle traffic per day and throughout the year and allow an analysis of different locations. In what follows, the data for the inner city of Berlin (corresponds roughly to the area within the Berlin S-Bahn ring) are outlined. Figure 2 shows the data from nine inner-city counting stations for the years 2019 and 2020. In order to allow a clearer data structure to be discerned, the moving average values for the last 7 days are shown for each day. Overall, it can be seen that bicycle traffic at the inner-city counting stations increased significantly in 2020. Given that the number of trips taken during the first lockdown in March 2020 was reduced, the steady increase in cycling in the spring of 2020 is particularly interesting. The data indicates that the bicycle gained in importance during the pandemic as a private means of transport. This is also supported by the fact that bicycle sales have increased. Although bicycle shops had to close in most federal states during the first lockdown in 2020 and the supply chains were partially interrupted due to restrictions in China and other parts of Asia, the Zweirad-Industrie-Verband (the German bicycle industry association) calculates that between January and June 2020 around 3.2 million bicycles and e-bikes were sold, 9.2% more than in the same period in the previous year (ZIV, 2020).

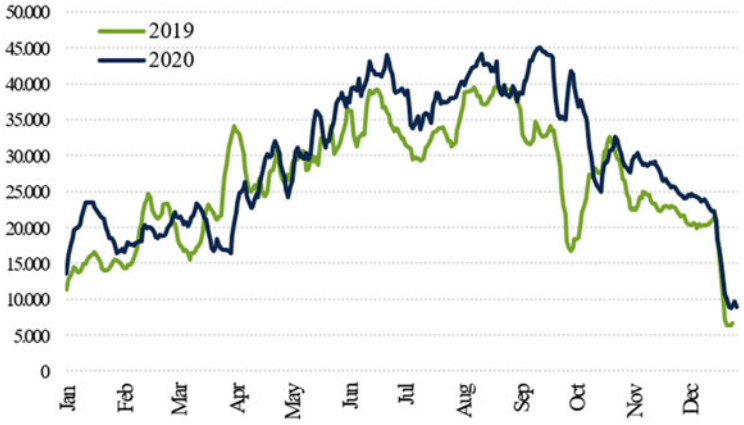

Fig. 2 Number of bicycles passing by at nine inner-city counting stations in Berlin in 2019 and 2020. Notes: moving average of the last 7 days (n = 20,245,063); own illustration; data: Senate Department for the Environment, Transport and Climate Protection (SenUVK) 2020

5.3 The Discussion Around the Distribution of Public Space Is Revived

During the first phase of the lockdown, the empty streets clearly showed that the majority of public space in cities is currently distributed in favour of motorised private transport. While there were hardly any cars on the streets, it was sometimes difficult to observe the minimum distance from other people on footpaths and in parks. Cycle paths were often not sufficient to meet the increased demand. In order to enable safe cycling and walking, new cycle paths were, therefore (temporarily) created, and footpaths expanded in many cities around the world. In Bogotá, Barcelona and Berlin, for example new cycle paths were quickly put in place in the summer of 2020. Within just a short time, multi-lane main roads were each provisionally designated one lane as a cycle path. A survey by Sinus (2020) in various German municipalities shows that 70% of the respondents rate the establishment of these cycle paths as very positive or rather positive. This high level of approval is found across all age groups and across cities of different sizes. In some cities, the so-called pop-up cycle paths have been set up for a temporary period; in other cities, such as Berlin, the cycle paths will be retained because they conform with the underlying plans and concepts.

In addition, more public spaces were created in summer 2020 for people to spend time and to walk (e.g. in Montréal, Dublin, Sydney, Brussels). In order to maintain minimum distances between people, prevent a lack of exercise and create opportunities for people to hang out, higher demands were placed on public space, and the municipalities redistributed it accordingly. In Berlin, for example temporary play streets were set up (see Fig. 3), which made it possible to use the streets on Sundays for hanging out and playing in the neighbourhood. In this case, the residents were involved in the design and in the compliance with regulations. Only through

Fig. 3 Temporary play streets in Berlin-Kreuzberg. Source: Julia Jarass

this commitment, it was possible to designate a total of 19 play streets and to look after them over the entire summer of 2020. At the same time, it was possible to test how a redesign of public space is accepted and how it should be fleshed out. Discussion meetings in the neighbourhood were used to collect ideas and address concerns. Some of the temporary play streets are now being converted into permanent city squares and pedestrian zones.

5.4 Making Temporary Projects Permanent and Strengthening Active Mobility

The advantage of the pop-up infrastructures is that they can be implemented quickly and then tested. Infrastructure that has been created on a provisional basis can be adapted accordingly in iterative steps so that structural changes are only made in the next step. As a result, the cityscape can be adapted within relatively short periods of time and using inexpensive measures. The extent to which cities will make use of this "new form" of urban and transport planning in the future is still open to question and is currently being investigated at the DLR Institute of Transport Research as part of a survey of administrative authorities in Germany. Pop-up infrastructures received a lot of media attention during the pandemic and also seemed to be largely positively received by the population; however, these are selective measures that were only implemented in some districts or cities.

6 The Impact of the COVID-19 Pandemic on Urban Mobility

Mobility in cities has changed due to the pandemic. Commuting routes to work are partially eliminated due to home office regulations, and leisure trips are less frequent, and, overall, there is a focus on one's local living environment. The change in route destinations is also leading to a shift in the use of transport.

Public transport is considered to be the backbone of the transport transformation, but it is under great pressure during the pandemic and may remain so afterwards. Passenger numbers are decreasing sharply, and the concern is that usage numbers will not fully recover, even after the pandemic. Several reasons for using local public transport have been eradicated due to the pandemic, but there is also a lower level of acceptance and willingness to use it. In addition to the risks, there are also opportunities for local public transport: increased digitalisation in the form of expanded data-supported planning of services based on the genuine demand for transport, which can thus better avoid overcrowding, and also results in a greater awareness of the needs and requirements of passengers.

During the pandemic, the use of private vehicles benefited from people's increased desire for privacy, safety, and hygiene. In addition, the avoidance of public transport and the changed reasons for travelling and the reduction in long-distance destinations—mainly due to the elimination of long commuting routes to work—have led to an increase in private car use. Furthermore, the desire to own a private vehicle is also increasing. There is a risk that the efforts of the transport transformation to reduce automobility and car ownership in cities will be set back by the pandemic.

Due to the focus on one's local living environment during the pandemic as well as the increased demand for "individual" and healthy mobility, cycling and walking are experiencing an upswing. The increased demand for active mobility as a resilient form of mobility was also accompanied in some districts or cities by the rapid creation of pop-up infrastructures. As a result, new bike paths, pedestrian zones or play streets were created within a short time. Some of these provisional redesigns have already been made permanent, though these are only limited to a few locations. In any case, they have shown how rapid changes in the cityscape are possible, thereby gaining attention worldwide and generating role models for fast and flexible action on the part of administrations.

7 Opportunities for Urban Mobility After the Pandemic

Mobility behaviour is heavily influenced by routines, which is why it is difficult to implement changes in behaviour if circumstances themselves remain constant. Radical changes in people's lives and special life events that frequently trigger a change in mobility behaviour are documented in the literature: retirement, moving house, starting a family (e.g. Jones & Ogilvie, 2012; Bamberg, 2006). The pandemic could also have a similar effect. Well-established routines of going to work or to the cinema by bus and train could be displaced if new routines are established during the

pandemic, such as using a car or the decreasing level of acceptance of public transport. A return to pre-COVID-19 mobility behaviour currently seems unlikely.

Yet, the far-reaching changes in mobility in cities can also be harnessed as a motivating force for reshaping ecomobility. In order to take advantage of the changes caused by the pandemic as an opportunity for sustainable urban mobility, the following aspects must be taken into account:

- All means of transport that fall under ecomobility should be encouraged and expanded accordingly, instead of only fortifying the bicycle, for example "as the winner of the crisis". *Uniting ecomobility forms of transport* is essential for a sustainable future. This should, on the one hand, involve reorganising local public transport and gearing it more towards the needs of the users (e.g. flexible and able to be booked digitally door-to-door services).
- On the other hand, the *upswing in active mobility* and the *redistribution of public space* should be continued and expanded based on overarching concepts. Because mobility may continue to be more geared towards the nearby living environment in the future due to commuting trips becoming redundant—e.g. due to flexible working and working from home—we could see a recapturing of public space. Furthermore, the rediscovery of the local environment that took place due to the pandemic because people were not travelling on holiday may also endure for leisure and recreational purposes.
- The increased attractiveness of active mobility and, along with this, the *lively discussion around public space* and the simultaneous "return" to private vehicles may intensify the conflicts concerning the use of the scarce public space in cities. The extent to which opportunities for retreat and infection-free encounters can be created in public space, thereby meaning that one's own vehicle does not become the symbol of retreat into private life, also depends on how urban and transport planning is organised. This is also where the temporary redesigns that have become familiar all over the world come in—such as pop-up bike paths, temporary play streets or rededicated parking spaces, which increase the quality of the time spent in one's immediate vicinity and enable the distancing rules to be observed in public spaces. At the same time, these pop-up infrastructures open up a "window of opportunity" for the transport transformation, as they highlight the relevance of recreational areas in cities and increased quality of time spent in urban spaces and also make clear which transport policy decisions are necessary and what role civil society can and wants to take on in the temporary redesign of the city. If nothing else, due to the focus on the local environment during the pandemic, *people's identification with their local surroundings* may possibly be strengthened, which activates civic engagement.
- Overall, the mobility-related effects of the pandemic require *swift action by administrations, politics, and civil society* in order to both harness activated potential on the one hand and initiate a realignment (of local public transport) on the other. Care must be taken here to ensure that the restrictions observed due to the crisis do not lead to rebound effects in urban mobility on the side of the users. At the same time, the experience of instant changes in behaviour and

political decisions—caused by the crisis—can also be helpful when it comes to implementing further measures to support the transport transformation.

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Julia Jarass studied geography in Berlin and Aix-en-Provence and has been working at the DLR Institute of Transport Research since 2011. She completed her dissertation in 2017 with the title "Neues Wohnen und Mobilität" (New Living and Mobility). Julia is deputy head of the transdisciplinary research group "Die Verkehrswende als sozial-ökologisches Realexperiment (EXPERI)" (The transport transformation as a social-ecological real-world experiment) and coordinator of the real-world experiments. She works on the support of active mobility and the transformation of public space. Her competences include participatory and transdisciplinary research.

Julia Schuppan holds a degree in sociology and completed her dissertation in the field of integrated transport planning on the topic of "Lebensereignisse und Mobilität" (Life events and mobility) at the Technical University of Berlin. She has been working at DLR since 2019 in the department "Mobility and Urban Development" and is investigating the individual requirements and urban effects of urban mobility innovations. Her methodological expertise includes mixed-method approaches of quantitative and qualitative social research.

Kerstin Stark holds a master's degree in sociology, political science, and philosophy and completed her dissertation in urban planning on the topic of mobility disadvantage and socially acceptable and sustainable mobility. She has been working at the Institute of Transport Research at DLR since 2017 and focuses on the effects of and requirements for mobility innovations as well as governance in the field of transport. Her methodological focus is on qualitative social research and participatory formats as well as mixed-method approaches.

The Preservation of Economic Structures as a Main Challenge of Urban Development

Christian A. Oberst

Abstract

When it comes to preserving economic structures, a distinction needs to be made between cyclical and structural challenges. In the short term, the focus should be on cushioning the financial impact of the necessary containment and protective measures. However, the economic aid in exceptional situations should not result in permanent structurally preserving support for unprofitable sectors and segments. Ideally, measures should be taken that maintain economic structures in the short term with adequate aid packages, but are limited in time. That means that the aid programs are still favourable even if there are some inefficient windfall effects in the short term. In the long term, it is uncertain, how the experience gained through the COVID-19 pandemic will change future consumer and user behaviour and what structural changes will result. Historical experience is only partially transferable to today's digital age. At present, a scenario that envisages a further increase in the proportion of online retailing with an accompanying greater market concentration of retailers and delivery service providers seems likely. Non-discriminatory access to online shopping platforms is, therefore, a key prerequisite for preserving competitive economic structures. In terms of urban development, a strong increase in online shopping will bring about further challenges, among other things, in the development of inner-city space and the establishment of new mobility concepts. In addition, the pandemic could reinforce or even perpetuate the existing demographic trend of people migrating to the outskirts of large cities.

C. A. Oberst (✉)
German Economic Institute (Institut der deutschen Wirtschaft Köln e.V.), Köln, Germany
e-mail: oberst@iwkoeln.de

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In the course of the COVID-19 pandemic, events have been following swiftly on from one another, epidemiologically as well as socially, politically, and economically. Common to all of them is a high degree of uncertainty: initial epidemiological uncertainty about the ways in which the virus is spread, the effectiveness of treatment methods and containment measures, and the expected duration of the crisis, including the different social and economic impacts, through to uncertain long-term changes in consumer and user behaviour and the associated structural effects brought about by the pandemic, which may also be changing the urban landscape.

When it comes to preserving economic structures, a distinction needs to be made between cyclical and structural challenges, and different levels of impact need to be taken into account, based on location, industry, or segment, for example. The macroeconomic baseline situation and overlapping developmental and transformation processes taking place at the same time must also be taken into account in any analysis and designing policy measures. Depending on particular aspects, different levels of government may be required to take action.

In the short term, measures aimed at preserving economic structures should focus on cushioning the sometimes extreme financial impact of the necessary containment and protective measures as quickly as possible. This task is primarily the responsibility of the higher political levels, i.e. the federal government and the states in Germany, and is not a fundamental task of urban development. However, the success or failure of federal and state economic measures will have an influence on any future structural need for action and the scope of urban development. While appropriate containment measures adopted to protect health are socially necessary and sensible, they do bring hardship for many companies affected. As any delay and inconsistency in the implementation of measures can lead to an exponentially higher level of affectedness, adequate, and speedy financial compensation paid to the companies affected should encourage the future acceptance and quick implementation of containment measures. Ideally, aid should only be granted to those companies whose financial distress is a consequence of containment measures and not to pre-existing problems. Since any kind of needs assessment requires time and administrative effort, a balance has to be struck on the one hand between the efficient use of public funds and support that is as needs-based as possible and to be fast, bureaucratic and effective assistance on the other hand. Urban development is likely to play a subordinate role in short-term cyclical measures and may only have a limited, complementary effect, for example in maintaining supply structures that are of particular importance for sustainable urban development and that have not been sufficiently taken into account in more general aid (for example cultural facilities or providers of innovative mobility concepts) and in supporting, coordinating, or developing temporary use concepts (for example setting up vaccination centres on exhibition grounds).

The political challenge still to be met will be to ensure that economic aid in exceptional situations does not result in permanent, structurally preserving support for unprofitable sectors and segments. During the crisis, for example there were frequent calls to safeguard the inner cities as retail locations. In the short term, such a

measure might be understandable given the disproportionate impact it could have, but in the medium to long term, the decisive factor should be whether the social benefit of maintaining the inner cities as retail locations outweighs the associated costs. This means that if people increasingly have goods delivered or just pick them up, there will be a need for more storage space close to city centres and alternative urban delivery models, but less need for bricks-and-mortar retail space—especially in city centres. Whether vacated areas are then used for social and cultural facilities, cafés and restaurants, offices or apartments depends above all on people's preferences and ultimately their willingness to pay for these facilities. Given the high degree of uncertainty in future land-use preferences, it would seem reasonable to focus on more flexible land-use concepts in urban development. In addition, concepts that are managed in terms of cooperation and integration could play an important role. These could provide for a diverse range of offers by jointly maintaining less profitable facilities in order to increase the attractiveness of the overall location. Managed site concepts could also be organised in collaboration with the regional business community or local interest groups.[1]

When interpreting the current development and impact indicators, it should be noted that the pandemic in Germany in spring 2020 hit an economic situation at the end of a long and dynamic growth phase. Industrial production, for example had already been experiencing a downturn since its peak in May 2018. At the beginning of the pandemic, industrial production and global trade in goods initially collapsed, but recovered more quickly than from the financial crisis (cf. SVR, 2020). With regard to economic activity in cities, the onset of the pandemic overlapped possible trend reversals in the real estate market. After nearly 10 years of steady increases in residential and commercial rents in major and university cities in the 2010s, there were signs in 2019 of at least a slow end to the real estate boom (cf. Henger, 2019; Oberst & Voigtländer, 2020). On the one hand, after a long economic upswing, most municipalities and most companies were thought to be well placed financially; on the other hand, even without the effects of the pandemic, many necessary and challenging adjustment processes were already in place—that will be discussed below under structural challenges. Municipalities and companies that were unable to build up financial reserves during the upswing are likely to come under particular pressure in the current situation and will be dependent on support from federal and state governments.

As far as companies are concerned, in addition to the sectors particularly affected by containment measures, such as hospitality and the events and tourism sectors, start-ups and companies in markets characterised by particularly intense competition are unlikely to have the necessary financial reserves. For example hospitality revenues fell by up to 87 percentage points in April 2020 and again from November 2020 compared with the same month a year earlier (see Fig. 1). The special impact assumed here for newly-founded companies and highly competitive industries seems

[1] More detailed considerations on the cooperative management of retail real estate can be found in Dascher and Daminger (2018), among others.

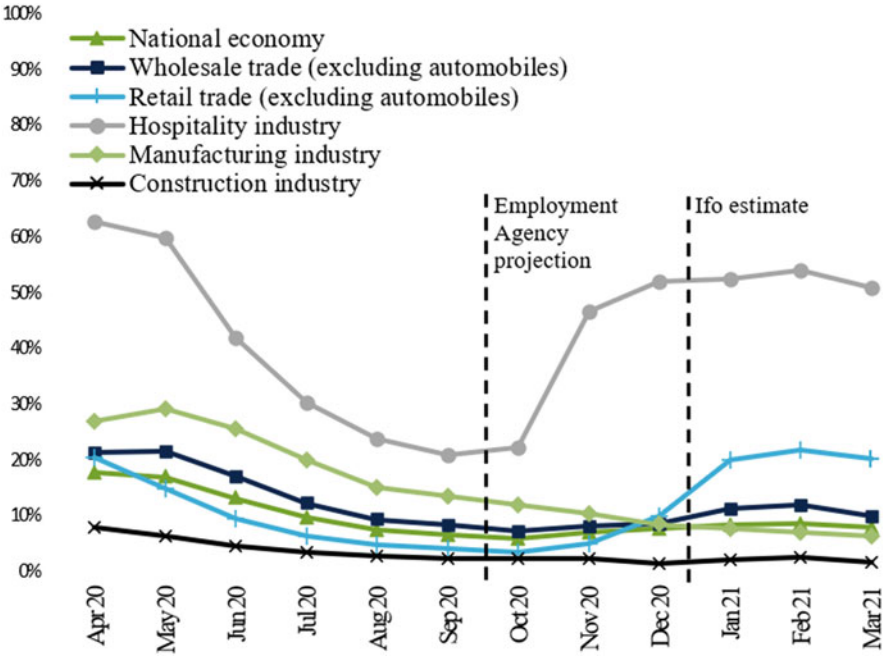

Fig. 1 Short-time work in selected industries. Source: Federal Employment Agency (Bundesagentur für Arbeit (BA); as of 31 March 2021); ifo Institute (2021), cited from ifo Institute (2021), own illustration

obvious but cannot be illustrated with aggregated industry statistics, since these do not usually differentiate the companies by date of market entry or the industry level of competition. The preservation of precisely these innovative and competitive market structures is a legitimate objective for measures preserving economic structures. In addition, companies located in central urban areas are likely to be particularly heavily impacted by high rent payments or mortgages. Short-term financial aid may make sense here too. However, the entitlement to defer rent payments by law merely shifts the liquidity problems from tenants to landlords. Against the backdrop of the previous prolonged property boom, one might not be wrong in thinking that landlords should have the necessary financial reserves. However, landlords may themselves be affected by the crisis in other ways, and most will have to make debt service payments to banks. Deferred rent defaults might incapacitate them from servicing the loans, leading to breaches in agreed financial terms, so-called financial covenants, and providing grounds for terminating the loans. The availability of financial reserves is also likely to vary widely among landlords, depending on location, asset class, portfolio size, the commencement of the purchase/financing, and is also likely to entail different funding requirements. As in the case of tenants, the government would also have to weigh up the sort of decisions described above between needs-based support and effective assistance for

landlords. However, rent deferral has another disadvantage—it is more prone to abuse, as landlords have fewer options in assessing need than the public sector. Before measures merely shift liquidity problems from tenants to landlords and from there, perhaps through further measures, to lenders (banks), it seems more sensible to start with preservation measures that target the beginning of the impact chain. Carelessly compiled legal regulations could even torpedo privately agreed compromises. The success of cyclical preservation measures will have a significant impact on the future urban landscape, but this is largely outside the scope of urban development.

Structurally, the pandemic is hitting the various economic sectors in cities at very different stages of their development and transformation. These processes include, among others, digital transformation, climate-friendly, and ecologically sustainable urban redevelopment, and demographic development manifested by ageing and shrinking populations, the latter especially in small and medium-sized towns in rural areas. All industries and regional categories are affected by the digital transformation, but the baseline situations are different**.** The markets for offices are changing due, among other things, to new opportunities and requirements for working from home and the flexible use of office space (i.e. co-working concepts). This change does not have to be accompanied by a quantitative reduction in space, but can also be expressed in a qualitative change in the use of space, such as additional communication areas or alternative locations, for example in easily accessible suburban/hinterland areas. A trend towards more office space per employee could also follow from corporate experience with the pandemic. In the short term, under the impact of the pandemic, the future quantitative demand for office space may be underestimated, as, to date, only a few companies are actually planning to reduce office space (cf. Stettes & Voigtländer, 2021). In the retail sector, the digital transformation is expressed above all in the declining importance of bricks-and-mortar retail to the benefit of online shopping (cf. Engels & Rusche, 2019) and the associated new requirements for urban logistics concepts (warehousing facilities close to city centres and delivery models).

Exactly how experience gained through the pandemic will change future consumer and user behaviour in the digital age in the long term is uncertain. On the one hand, consumers may become accustomed to shopping online with its doorstep deliveries and click and collect pick-ups and may have permanently overcome previous barriers to acceptance for certain products, such as groceries (cf. Demary, 2020; Engels & Rusche, 2020). This development may well in part have already kicked in and was merely accelerated by the pandemic. On the other hand, once pandemic restrictions ease, consumers could feel an increased need to catch up on their consumption experience in person in stores and city centres, sometimes in combination with cultural and hospitality facilities—thus some kind of pent-up demand could arise for shopping behaviour. Another aspect is that the significant increase in demand for delivery services could, on the one hand, lead to the establishment of several delivery infrastructures operating side by side with even small local retailers utilising delivery options (either their own or third-party services). From an economic perspective, therefore, the increase in demand will

eliminate the previous natural monopoly position of some local delivery services as a single company will not necessarily work more cost-efficiently than several service providers. On the other hand, the extent of market concentration in the hands of the few established online retailers and couriers that we see today is worrying in terms of competition policy. Although market concentration is only an indicator of the market power of companies, there is the (abuse) risk that suppliers with market power will fend off competitors, depress wages and be less innovative, and that mark-ups and price differentiation could easily be put into effect resulting in higher prices for consumers in the long term. Competition policy has an important role to play in preserving economic structures. There could also be a concentration of retail locations towards larger cities at the expense of shopping locations in smaller cities. Whether this becomes a task for regional policy is another question since delivery concepts may be able to fashion equivalent living conditions better than the existing bricks-and-mortar retail.

At present, a scenario that envisages a further increase in the proportion of online retailing with an accompanying greater market concentration of retailers and delivery service providers seems likely. Non-discriminatory access to online shopping platforms is therefore a key prerequisite for preserving competitive economic structures. In terms of urban development, a strong increase in online shopping will bring about further challenges, among other things, in the development of inner-city space and the establishment of new mobility concepts. At least in the short term, the pandemic is likely to counteract any mobility turnaround in passenger transport, with people tending to avoid public transport, relying instead more on private transport (see chapter "How COVID-19 Is Changing Mobility Behaviour and What that Means for Sustainable Urban Transport"—Jarass et al., 2021). The lasting impact of the pandemic on the success of recent innovations in this sector and on the environmental footprint of the trade in goods and services is uncertain. However, technological innovations and changing consumer and work preferences and habits will not only change the structure of suppliers and industries, but will also have an impact on the spatial distribution of economic activities. One possibility would be for urban development to counteract local market concentration, for example with its own retail and delivery concepts or support for local business models that form part of the sharing economy. Overall, technological diffusion processes have shown that both too slow and too fast market diffusion can be harmful to welfare. While the disadvantages of too slow market diffusion are obvious (with potential not being used), theoretically a too speedy market diffusion can also be disadvantageous, especially if an inferior technology becomes established on the market too early (demonstrating high path dependency and quasi-irreversibility) or if due to different baseline conditions the too speady diffusion leads to an increase inequality. Broadly speaking, societal adaptations to the pandemic have accelerated digital transformation and have the potential to increase inequalities in the future (see for example in the school education).

In addition, the pandemic could reinforce or even perpetuate the existing demographic trend of people migrating to the outskirts of large cities due, among other things, to an increased desire for more living space, an additional room for (home)

office, or for a detached house with a garden and parking space, while commuting distance has become less relevant given the increase of remote working. People migrated to the urban hinterland and beyond prior to the pandemic, but until recently, this was overshadowed by influx from abroad. Since 2014, more nationals have been moving out of the major cities than moving in (cf. Henger & Oberst, 2019). The extent to which immigration figures will change in the course of the crisis cannot yet be estimated. Again, the pandemic is not the trigger but rather an amplifier of the migration trend to the surrounding suburban municipalities. In the medium term, however, it could also have the opposite effect if, for example after the pandemic, there is again increasing preference for living close to the centre within walking distance to everyday needs, the workplace and cultural facilities. It may well be that cities quickly return to their original development paths once temporary restrictions have been lifted, as can be seen by the effects of pandemics on urban development and housing markets of Amsterdam and Paris in the seventeenth and nineteenth centuries, respectively (see Francke & Korevaar, 2021). An alternative hypothesis is that segments may also continue to diverge and that—depending on the consumer group—trends develop both for living close to the centre and for large-scale living in the surrounding areas, to the detriment of the intermediate areas. If companies also follow the trend towards locating in the surrounding suburban municipalities, this will lead to a further functional enrichment of peripheral areas.

Overall, it should be noted that, apart from shifts between segments, the pandemic does not necessarily have to be associated with negative effects on the (urban) real estate market. As in the wake of the financial crisis (cf. Lerbs & Oberst, 2011), the worsening outlook for income is offset by other demand drivers, such as the increased preference for more residential space or for logistics space. However, with the trend towards locating in the suburban municipalities, urban development faces the challenges of connecting newly emerging neighbourhoods to public transport and also limiting land use (cf. 30-ha target in the national sustainability strategy).

Obviously, the various industries have been affected differently by the containment measures (see Fig. 1 Workers on short-time and Fig. 2 Revenue development for selected industries). The development of short-time working and revenue figures in the hotel and restaurant industry clearly show both the disproportionate impact on the sector and the timing of the containment measures (first lockdown from March 2020, easing in May 2020, as well as partial lockdown from November 2020 and second lockdown from mid-December 2020).

In addition to the hospitality industry, the event and tourism industries are likely to be particularly hard hit in the cities. Moreover, the charts show that retailers were hit harder in the second lockdown, which also coincided with the end of the all-important Christmas shopping season. In contrast, online retailing as a whole, and especially that of market-leading companies and the urban logistics required for it, benefited. But even within the sectors, the impact is likely to vary; in the case of gastronomy, for example it depends on how strongly the business depends on site experience and if a delivery service can be set up. In addition, the scope of the economic impact has so far only been partly reflected in economic indicators.

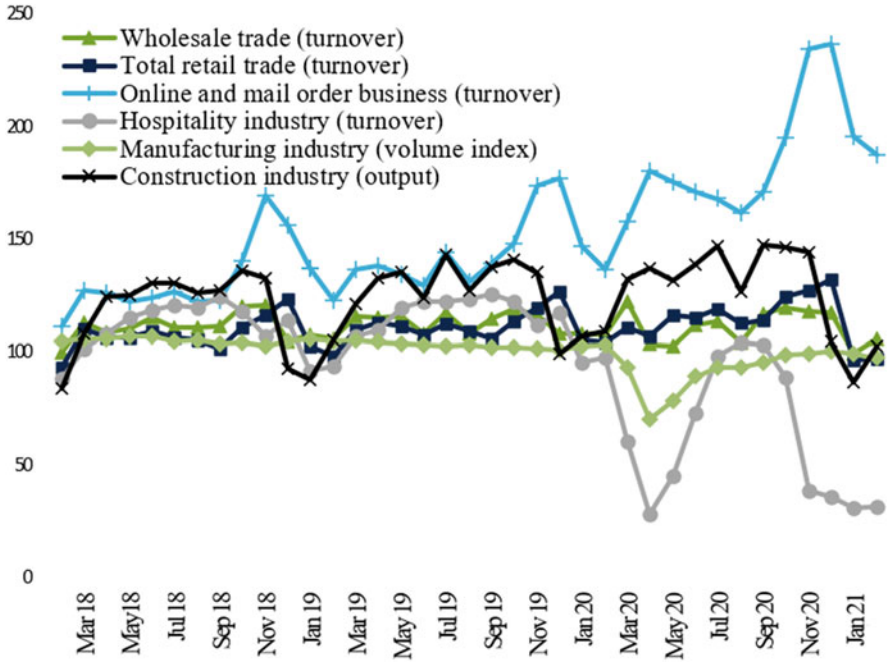

Fig. 2 Indexed revenue sales and production trend for selected industries (2015 = 100). Source: Destatis (2021), own illustration

Short-time working allowances, bridging assistance and other state benefits cushion the effects of the crisis. The extent of pandemic-related loan defaults and insolvencies is also not yet foreseeable given the on-going exemptions from any obligation to file for insolvency. It is not clear how many companies will become over-indebted or deplete their financial reserves in the course of the crisis and to what extent this will limit investments, but many experts expect a sharp rise in insolvencies in 2021 (see, for example ifo Institute, 2020; Dierig et al., 2020; Creditreform, 2020; cited in Röhl, 2020), especially as many affected companies have had to wait for a very long time for benefits pledged by the state.

Despite public speculation about possible structural changes as a result of the pandemic—enduring and increased working from home, online shopping, a return to local structures and families and developments derived from this, such as the increased migration to the suburban areas and the countryside—the long-term effects of the pandemic in terms of their magnitude, relevance, and even the direction of the effects cannot yet be truly assessed. Historical experience is also only partially transferable to today's digital age. It is therefore important to consider the actual limits of the current state of knowledge, especially when conducting timely analyses on how to cope with and shape structural changes brought about by the pandemic. Looking ahead, the only thing that is clear for the time being is the high level of

uncertainty. This is likely to make investment and transformation processes even more difficult, on top of the already limited financial resources. Urban development policy will be more concerned with long-term structural challenges than with the short-term preservation of economic structures. To this end, strategies must be developed for adaptation processes whose scope and lasting behavioural changes cannot yet be clearly identified. Against this background, urban development measures should aim to facilitate a more flexible use of settlement areas (for example making vacant office and retail space usable for cultural events and residential concepts).

Thus, this chapter concludes with three possible future scenarios on economic structures.

1. Assuming that no or too few political measures are taken to preserve economic structures, a wave of bankruptcies in bricks-and-mortar retail and in the hospitality and tourism industries in particular would be the likely consequence. This would initiate a downward spiral, especially in small and medium-sized locations, and ultimately lead to further company closures and a reduction in the range of services offered locally. Companies may also disappear from the market that actually might have had profitable and innovative business models, but lacked the liquidity reserves and lender confidence to survive the losses of the unexpectedly prolonged state of emergency. However, this scenario is rather unlikely due to the far-reaching measures taken by the federal government in Germany. Still, as soon as state aid ends or is no longer sufficient, banks themselves will also come under pressure (for example when the obligation to file for insolvency—which was temporarily suspended—comes back into force). According to BaFin, Germany's financial services regulator, a banking crisis is unlikely at present (see New Year's greeting 2021 from Felix Hufeld, President of BaFin). In urban development, this could lead to an increasing market and location concentration as well as a less diverse supply structure, which is detrimental to consumers.
2. Assuming that the structural preservation measures taken are too strong and permanent, a supply structure could be maintained that is actually no longer desired by the population. Promoting obsolete supply structures would take up public resources that could be put to greater use elsewhere. An example of this would be to rescue department stores that were already struggling before the emergency.
3. Ideally, measures should be taken that maintain economic structures in the short term with adequate aid packages. The fact that these would be limited in time means that the measures would be more favourable overall than if certain industries and locations were supported permanently or at least in the long term—even if there are some inefficient windfall effects in the short term. These measures should be more profitable for the state in the long run than no measures or too few measures. On the one hand, this means that more taxes can be collected in the medium term and that the economy as a whole would be moving along a path of higher potential growth; on the other hand, this permits the required structural change in the medium and long term, while at the same

time preserving the capacities of innovative and promising business models during this exceptional situation. Such a framework would allow for a supply structure that meets people's preferences. In the process of trial and error, the locations with the best supply concepts will prevail. These concepts will then be adopted by less successful locations with similar conditions, resulting in a supply structure that is ultimately in line with preferences. Location concepts in the inner cities that are managed in a cooperative and integrative fashion could be such an approach.

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Christian A. Oberst studied economics in Münster and Rotterdam. He then worked at the Institute for Spatial and Housing Economics at the University of Münster, with study visits to the Spatial Econometrics Advanced Institute in Rome and the University of São Paulo, before spending 6 years as a postdoctoral researcher at the E.ON Energy Research Center at RWTH Aachen University. Since 2018, he has been a Senior Economist for housing policy and real estate economics at the German Economic Institute, where he also deals with issues of regional policy and development. He has also been a board member of the International Network for Economic Research since 2015.

Revisiting the Economic Effects of Density in the Wake of the COVID-19 Pandemic

Gabriel M. Ahlfeldt and Elisabetta Pietrostefani

Abstract

The containment measures spurred by the COVID-19 pandemic restrict economic and social interaction in physical space and, hence, erode the comparative advantages of big cities that arise from density. We provide an accessible summary of the various costs and benefits associated with density and discuss how a reduction in net returns to density affects the spatial distribution of economic activity within a dynamic spatial model. The main takeaways are twofold. First, the collective evidence developed over decades of research into the economic effects of density suggests that prior to the pandemic, the benefits associated with density exceeded the costs, at least for moderately large cities in developed countries. Second, a sustainable reduction of the ability to socially and professionally interact in cities can have a severe impact on how the relative costs and benefits of density play out in equilibrium, potentially leading to a major relocation of population from larger to smaller cities.

1 Introduction

The world is currently experiencing the largest pandemic since the Spanish flu one century ago. To contain the spread of the COVID-19 virus, governments have implemented surveillance, quarantine, and social distancing measures. These

G. M. Ahlfeldt (✉)
London School of Economics and Political Sciences, Centre for Economic Policy Research, London, UK
e-mail: g.ahlfeldt@lse.ac.uk

E. Pietrostefani
London School of Economics and Political Sciences, University College London, London, UK
e-mail: e.pietrostefani@ucl.ac.uk

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necessary measures severely restrict economic and social interaction in physical spaces and, hence, erode the comparative advantages that arise from the density of big cities. This has led to many distinguished thinkers expressing their diverse views on how the pandemic might shape future cities (Abel et al., 2020). Nathan and Overman (2020) provide an excellent summary of the public debate on whether and why there might be a "big city exodus".

We contribute to this debate in two mutually complementary ways. First, we provide an accessible and yet comprehensive summary of the various costs and benefits associated with density, building on a recent quantitative review (Ahlfeldt & Pietrostefani, 2019). Second, we summarize the results of model-based counterfactual simulations that seek to evaluate how a loss of density-related economic and social benefits would lead to a reallocation of economic activity across German labour markets (Ahlfeldt et al., 2020). The main takeaways are twofold. First, the collective evidence developed over decades of research into the economic effects of density suggests that prior to the pandemic, the benefits associated with density exceeded the costs, at least for moderately large cities in developed countries. Second, a sustainable reduction of the ability to socially and professionally interact in cities can have a severe impact on how the relative costs and benefits of density play out in equilibrium, potentially leading to a major relocation of population from larger to smaller cities.

Our contribution is complementary to a growing strand of research that analyses the determinants of the spread of the coronavirus and the direct effects the pandemic has had on economic and social outcomes. The expanding literature indicates that crowding (Almagro & Orane-Hutchinson, 2020) and mobility (Glaeser et al., 2020) of workers in cities can increase the spread of the virus. Precautionary measures, access to healthcare and favourable demographics mitigate the potentially larger vulnerability of denser cities (Provenzano et al., 2020). Recent research has also focused on the effects of the pandemic on the labour market (Dingel & Neiman, 2020), mental health and well-being (Tubadji et al., 2020), domestic violence (Beland et al., 2020), and pollution (Almond et al., 2020). In contrast to this growing literature, we focus on the indirect effects the pandemic could have through erosion of density-related benefits and a reversion of the secular trend towards ever higher levels of spatial concentration.[1]

2 Building an Evidence Base

To build a comprehensive summary of the various costs and benefits associated with density, Ahlfeldt and Pietrostefani (2019) compile a unique evidence base that contains 347 estimates (from 180 studies) of density elasticities of various outcomes

[1] Selected portions of this chapter have previously appeared in Ahlfeldt, G.M. and Pietrostefani, E. (2019), The economic effects of density: A synthesis, *Journal of Urban Economics*, 111 (February): 93–107.

including accessibility (job accessibility, access to private and public services), various economic outcomes (productivity, innovation, and value of space), various environmental outcomes (open space preservation and biodiversity, pollution reduction, energy efficiency), efficiency of public service delivery, health, safety, social equity, transport (ease of traffic flow, sustainable mode choice), and self-reported well-being. Each density elasticity relates a change in density to a change in an outcome in percentage terms.[2] Along with the density elasticities, the authors encode various study characteristics such as the publication date and venue, the geographic origin, and layer of analysis, among others.

To capture the rigour of the analysis, the authors also encode the method on a Scientific Methods Scale (WWC, 2016) that ranges from 0: purely descriptive to 4: exploiting plausibly exogenous variation, and construct a year-since-publication-adjusted citation index using data from Scopus and Google Scholar as a measure of impact. The authors make an effort to increase the evidence base by inferring density elasticity estimates from reported city size elasticity estimates and by conducting back-of-the-envelope calculations to approximate density elasticity estimates if results are reported as estimated marginal effects in levels, semi-elasticities, or in graphical illustrations. Finally, some authors kindly provided density elasticity estimates on request, which were not reported in their papers (e.g. Couture, 2016; Tang, 2015; Albouy, 2008).

Where the evidence base is thin or inconsistent, Ahlfeldt and Pietrostefani (2019) provide their own transparent density elasticity estimates based on a consistent econometric framework and OECD data that refer to 16 distinct outcome variables. While the evidence base covers most world regions to some extent, there is a strong concentration of studies from high-income countries and, in particular, from North America.

3 The Costs and Benefits of Density Prior to the Pandemic

To summarise the various costs and benefits associated with density, Ahlfeldt and Pietrostefani (2019) condense the evidence reviewed, as well as the original estimates, into a set of recommended density elasticities for a range of outcome categories listed in column 3 of Table 1. Specific to each category, the authors recommend a citation-weighted mean across the elasticities in the evidence base, an estimate from a high-quality original research paper or one of their original estimates. The recommended elasticities represent a potentially useful resource for researchers wishing to explore the welfare effects of policies related to economic density.

An important takeaway is that there is sufficient evidence that seriously engages with separating the effects of density from the effects of correlated unobserved fundamentals to allow for a causal interpretation in the following categories: 1:

[2] Formally, a density (D) elasticity of an outcome Y is defined as as $e = \frac{d \ln Y}{d \ln D}$.

Table 1 Present value[a] of a 1% increase in density I: Category-specific effects

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Category			Quantity, p.c., year		Unit value		PV of 1%
ID	Outcome	Elast.	Variable	Value	Unit	Value	Dens. incr. ($)
1	Wage	0.04	Income ($)	35,000	–	1	280
2	Patent intensity	0.21	Patents (#)	2.06E-04	Patent value ($/#)	793K	7
3	Rent	0.15	Income ($)	35,000	Expenditure share	0.33	347
4	VMT[b] reduction	0.06	VMT[b] (mile)	10,658	Priv. cost $/mile	0.83	107
5	Variety value[c]	0.12[b]	Income ($)	35,000	Expenditure share[d]	0.14	115
6	Local public spending	0.17	Total spending ($)	1463	–	1	50
7	Wage gap[e] reduction	−0.035	Income ($)	35,000	Inequality premium	0.048	−12
8	Crime rate[f] reduction	0.085	Crimes (#)	0.29	Full cost ($/#)	3224	16
9	Green density	0.28	Green area (p.c., m^2)	540	Park value ($/$m^2$)	0.3	100
10	Pollution reduction	−0.13	Rent ($)	11,550	Rent-poll. elasticity	0.3	−90
11	Energy use reduction (private and social effects)	0.07	Energy (1M BTU)	121.85	Cost ($/1M BTU)	18.7	32
		0.07	CO2 emissions (t)	25	Social cost ($/t)	43	15
12	Average speed	−0.12	Driving time (h)	274	VOT[g] ($/h)	10.75	−71
13	Car use reduction	0.05	VMT[b]	10,658	Social cost ($/mile)[h]	0.016	2

14	Health	−0.09	Mortality risk[i] (#)	5.08E-04	Value of life ($/#)[j]	7M	−64
15	Self-reported well-being[k]	−0.004	Income ($)	35,000	Inc.-happ. elasticity	2	−52

Notes: Source: Ahlfeldt and Pietrostefani (2019). Monetary equivalents represent area-based effects, including selection effects
[a]The per-capita present value for an infinite horizon and a 5% discount rate
[b]Vehicle miles travelled
[c]Reduction in price index of consumption varieties
[d]Local non-tradables: home, entertainment, and apparel and services
[e]Assuming a wage gap of high-skilled vs. low-skilled that corresponds to the 80th vs. 20th percentiles in the wage distribution
[f]All crimes against individuals and households
[g]Vehicle operating time
[h]Emissions externality
[i]Pre-mature (<70) mortality rate
[j]Statistical value of life
[k]Self-reported well-being
See appendix Sect. 5 for a discussion of the assumptions on quantities and unit values by category (Ahlfeldt & Pietrostefani, 2019)

Wage and productivity; 3: Rent; 4: Vehicle miles travelled; 10: Pollution reduction; and 12: Average speed. For the other categories, the estimated elasticities are better interpreted as associations in the data. Any causal interpretation will rest on the strong assumption that density has been determined by historic factors that no longer have effects on contemporary outcomes. Significant uncertainty surrounds the effects of density on income inequality, urban green, health, and self-reported well-being. In general, the recommended elasticities are best understood as describing area-based effects that include composition effects.[3]

In the last step of the analysis, Ahlfeldt and Pietrostefani (2019) monetise the economic effects of density to provide some more explicit policy guidance. For each of the 15 outcome categories, they combine the recommended density elasticity estimates with several valuations of non-marketed goods such as time, crime, and mortality risk, or pollution, among many others. They compute the per capita present value (PV, at a conventional 5% discount rate) of the effect of a 1% increase in density for a scenario that roughly corresponds to an average metropolitan area in a developed country. The monetary equivalents allow for a novel accounting of the costs and benefits of density and how the net effect of density across a broad range of amenity and disamenity categories aligns with estimates of quality of life based on cost-earning differentials.[4] The presentation of the results is reflected in Table 1. The monetary effect in the last column (8) is simply the product over the elasticity (3), the base value (5), the unit value (7), a 1% increase in density, and the inverse of the 5% discount rate.[5] A context-specific monetary equivalent can be calculated by changing any of the factors.

The exercise is ambitious and there are some limitations. First, the monetary equivalents are estimates that most closely refer to large metropolitan areas in high-income countries. In drawing conclusions for a specific institutional context or any further use of the suggested monetary equivalents, it is strongly advised to consult Sect. 5 of the online appendix to Ahlfeldt and Pietrostefani (2019). Second, the results in Table 1 do not necessarily correspond to the short-run effect of a policy-induced change in density. For example, an increase in population holding the developed area constant will increase population density, but not necessarily the green density. However, the green density will be higher than in a counterfactual where the population growth was achieved by holding density constant. Third, the effects implied by the elasticities apply to marginal changes only, i.e. they should not be used to evaluate the likely effects of extreme changes (e.g. a 100% increase in density) in particular settings. Fourth, some of the outcomes, the density-induced

[3] As the quality and quantity of the evidence base is highly heterogeneous across categories, it is strongly advised to consult Ahlfeldt and Pietrostefani (2019) for a discussion of the origin of each of the recommended elasticities against the quality and quantity of the evidence base, before applying any of the elasticities reported in Table 1 in further research.

[4] The indirect inference of quality of life from relative wages goes back to the work pioneered by Rosen (1979) and Roback (1982) which has spurred a growing literature (see Albouy and Lue (2015) for a review).

[5] As an example, the wage effect is computed as $0.04 \times \$35{,}000 \times 1 \times 1\%/5\%$.

increase is to some extent driven by composition effects. As an example, the share of high-skilled is typically higher in denser places. Hence, the effect of a similarly qualified worker increases by less than 0.04% if density increases by 1%.

Despite these limitations, Table 1 offers novel insights into the direction and the relative importance of density effects. The density effect on wages, which has been thoroughly investigated in the agglomerations literature, is large, but not as large as the effect on rents, on average.[6] Density generates costs in the form of higher congestion and lower average road speeds, which are, however, more than compensated for by the cost reductions due to shorter trips. Agglomeration benefits on the consumption side due to larger and more accessible consumption variety are quantitatively important and amount to more than one-third of agglomeration benefits on the production side (wages). Other quantitatively relevant benefits arising from density include cost savings in the provision of local public services, preserved green spaces, lower crime rates (outside the United States), and reduced energy use, which creates a sizeable social benefit (reduced carbon emissions) in addition to private cost savings. Besides the aforementioned congestion effects, the cost of density comes in the form of increased pollution concentration, inequality, adverse health effects, and reduced well-being.

Given that the paper goes a long way towards computing category-specific estimates of costs and benefits that are comparable across categories, a natural question arises: Do the benefits of density exceed the costs and, if so, by how much? To address this question, Ahlfeldt and Pietrostefani (2019) conduct a simple accounting exercise, which we have replicated in Table 2. The table distinguishes between private (columns 1–5) and external (column 6) costs and benefits, which residents do not directly experience and likely do not pay for via rents (such as reductions in carbon emissions that have global rather than local effects). To avoid double-counting, gasoline costs are excluded in computing the benefits of shorter average trips (category 4) as this cost-saving is already accounted for by reduced energy consumption (category 11). Also, the authors have corrected for consumption benefits (category 5) to reflect the pure gains from variety and not savings due to shorter car trips, which are already itemised in category (4). Since health effects are itemised in 14, an estimate of the health cost arising from density-related pollution is used from Carozzi and Roth (2018) to restrict the pollution effect to an amenity channel. The external effect from sustainable mode choice (13) is already itemised in the external benefit of reduced energy use (11) and is, thus, not counted separately. In the baseline scenario (Sum row), Ahlfeldt and Pietrostefani (2019) assume that public services are nationally funded. In an alternative accounting (indicated in the bottom of the table), they assume that public services are locally funded, so that density-induced cost savings fully capitalise into rents (via lower taxes).

[6]The results by Combes et al. (2018) suggest that this result may not apply to small cities as the rent elasticity increases in city size.

Table 2 Present value[a] effects of a 1% increase in density II: Accounting

		(1)	(2)	(3)	(4)	(5)	(6)
	Outcome	Factor	Quality	Amenity	Effect on		External
ID	Category	Incomes	of life	value	Owner	Renter	welfare
1	Wage	280	−190[b]	0	190[c]	190[c]	0
2	Innovation	0	0	0	0	0	6
3	Value of space	347	347	0	0	−347	0
4	Job accessibility	0	0	87[d]	87[d]	87[d]	0
5	Services access	0	0	99[e]	99[e]	99[e]	0
6	Eff. of pub. services delivery	0	0	0	0	0	50
7	Social equity	0	0	0	0	0	−12
8	Safety	0	0	16	16	16	0
9	Urban green	0	0	100	100	100	0
10	Pollution reduction	0	0	−47[f]	−47[f]	−47[f]	0
11	Energy efficiency	0	0	32	32	32	15
12	Traffic flow	0	0	−71	−71	−71	0
13	Car use reduction	0	0	0	0	0	0[g]
14	Health	0	0	−64	−64	−64	0
15	Self-reported well-being	0	0	−52	−52	−52	0
	Sum	627	157	100	291	−56	60
	Excl. subj. well-being	–	–	152	342	−4	60
	Nationally financed public services	–	106		340	−6	
	Factor incomes and externality	686	–	–	–	–	–
	Locally financed public services	637	–	–	–	–	–

Notes: Source: Ahlfeldt and Pietrostefani (2019)
[a]The present value per capita for an infinite horizon and a 5% discount rate. All values in $
[b]Amenity equivalent of after-tax wage increases assuming a marginal tax rate of 32% as in Albouy and Lue (2015)
[c]After-tax wage increase as discussed in [b]
[d]Excludes $19.18 of driving energy cost ($0.15/mile gasoline cost) discounted at 5%, which are itemised in 11
[e]Assumes a 10.2% elasticity to avoid double-counting of road trips already included in 4
[f]Amenity effect, excludes health effect itemised in 14
[g]Set to zero to avoid double counting with 11
Numbers reported in the "Locally financed public services" row assume that cost savings in local public services are fully passed on to residents via lower taxes

Overall, the evidence suggests that density—in a world without COVID-19—is a net amenity. This does not imply, however, that everybody necessarily benefits from densification policies. Renters may be net losers of densification because of rent effects that exceed amenity benefits. The negative net effect is consistent with a negative density effect on well-being if individuals are attached to some areas more

than others. If one is willing to believe that there are strong forces that prevent renters from moving, a supply constraining effect of density can shift renters to a lower utility level, consistent with a negative effect on well-being (or happiness). The evidence also suggests there is a positive net external (to the city) welfare effect, which is primarily driven by the lower cost of providing (nationally funded) local public services (column 6). Summing up the monetary equivalents of all amenity and disamenity categories (sum in column 3) results in a positive value that is smaller than the 'compensating differential' (sum in column 2). While density seems to be a net amenity, the results suggest that part of the rent increase may be attributable to the higher cost of providing space in addition to enjoyable amenities.

4 Density and COVID-19

While it is ultimately hard to know how large and persistent the effect of the pandemic will be, the following thought experiments serve to evaluate how dependent big cities are on returns to density in production and consumption: What would happen if all positive effects of agglomeration on productivity (e.g. knowledge diffusion, labour market pooling, and vertical linkages) and amenities (e.g. access to restaurants, clubs, and theatres) would disappear?

Ahlfeldt et al. (2020) use a new dynamic spatial (DSM) model to answer this question. The model is well suited for the task since it features labour market-related agglomeration (higher wages) and housing market-related congestion forces (higher rents), costly migration (that can depend on geographic, cultural, or social distance) and idiosyncratic locational preferences. Unlike in a conventional spatial equilibrium model where identical workers are perfectly mobile, some workers are more attached to certain types of cities than others in the DSM. This is important because, realistically, not everyone will leave big cities immediately, even if wages drop, quality of life objectively falls, and rents remain high. All structural parameters and fundamentals of the model have been estimated or inverted using a large data set covering 30 million workers and 20 million housing prices in Germany.

Concretely, the authors use the model to solve for a counterfactual general equilibrium of the spatial economy and compare the distribution of wages, rents, skills, GDP, and utility in the counterfactual to the initial equilibrium. With this approach, the model delivers predictions for 18 groups defined by age, gender, and skill in 141 German local labour markets (LLMs). The authors aggregate the effects to two types of labour markets: large LLMs with a working population of more than 250k and small LLMs with a smaller population.

To evaluate the effects operating through the production side, they set the density elasticity of productivity to zero in the counterfactual. The result is that the larger LLMs lose 8.8% of their population to the smaller LLMs, whose population increases by 9.5%. Gross domestic product (GDP) declines by 16% (large LLMs) and 2.4% (small LLMs). GDP shrinks in the small LLMs despite an increase in population because even small LLMs experience a significant loss of productivity. The lower wage bill results in lower house prices due to a reduction in housing

Table 3 Upper bound effects of loss of density-related benefits on large and small German labour markets

Outcome	Aggregate effect	Large LLMs	Small LLMs
Population	1.000	0.621	1.508
GDP	0.891	0.554	1.379
Average wage	0.891	0.893	0.914
Average rent	0.718	0.889	1.051
High skilled share	1.000	1.008	1.169
Skilled share	1.000	0.961	0.979
Average utility	0.548	0.551	0.707

Notes: Source: Ahlfeldt et al. (2020). Large (small) local labour markets have a working population of more (less) than 250K. All results are ratios of the outcome in a counterfactual equilibrium (without density benefits) over the initial equilibrium. The counterfactual is a fictional scenario in which all spatial spillovers that arise from professional and social interaction disappear forever

demand in both types of LLM, but, at more than 4%, the reduction is nearly ten times as large in the larger LLMs than in the smaller LLMs. Note that these numbers are based on a long-run comparison of stationary spatial equilibria which are separated by a long transition period. Hence, housing is elastic.[7] In the short run, inelastic housing supply implies greater house price responses.

To evaluate the effects operating through the consumption side, the authors follow Ahlfeldt (2013) and argue that geotagged photos shared on social media form a useful big data index since pictures are often taken at places of social interaction (e.g. in a pub or an art gallery). Next, they establish the (conditional) correlation between the big data index (based on geotagged social media) and quality of life in the model. Finally, they lower the big data index to the lowest level observed across all LLMs to obtain quality of life in a low-social interactions scenario. Adding the quality-of-life effect to the productivity effect, large LLMs lose 40% of their population and 45% of their GDP (Table 3). Population and GDP increase by 50% and 38% in the smaller LLMs. The effect on rent is particularly interesting as the productivity and quality-of-life effects work in opposite directions for smaller LLMs. The net effect is a 5.1% increase in rent. What sounds like good news for landlords, is, of course, bad news for renters. For the large LLMs, lower demand results in plummeting rents (−11%).

One important takeaway is that the quality-of-life effect that a permanent reduction in social interaction could have is potentially very large, particularly so in big cities. While understanding how the pandemic has transformed our working lives is important (Dingel & Neiman, 2020), the effect on the quality of life of city dwellers is equivalently relevant.

[7] Housing is produced by a competitive construction sector using a Cobb-Douglas housing production function with a land share of about 0.2 and a capital share of about 0.8. In the long run, housing stock is perfectly malleable.

5 Conclusion

This chapter summarises a variety of density-related costs and benefits and illustrates how the balance could change if cities lost all the benefits arising from density-induced professional and social interaction. We wish to highlight that our contribution to the debate on the future of cities is theoretical and not empirical. We cannot predict how the pandemic will ultimately impact on how we live and work in cities, and neither can any economic model. What we have discussed is a fictional scenario in which all spatial spillovers disappeared forever. Even in this unlikely scenario, our model predicts that it would take decades to complete just half of the transition to the new equilibrium. Yet, there are important implications. While understanding how the pandemic has transformed the working lives of urban residents is important, the effect on the quality of life of city dwellers is equivalently relevant. A loss of density-induced productivity would lead to a sizable reduction in GDP and a wave of migration from large to smaller cities. Yet, inaccessibility of cultural, gastronomic, and nightlife amenities that facilitate social interaction could have as large if not larger welfare consequences. Moreover, a more dispersed distribution of economic activity would come with a range of benefits but also costs. Just to name a few, housing would become more affordable, on average, road congestion would be mitigated, and there would be positive health effects, e.g. due to reduced exposure to pollution. However, wages would be lower, the variety of non-tradable consumption amenities would decrease, the provision of infrastructure would become more expensive, and the carbon footprint would grow. On balance, we should hope that behavioural adjustments and technological innovations (cheaper and quicker tests and effective vaccines) will mitigate the long-run impact of the pandemic, and big cities will stick around for a while.

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Gabriel Ahlfeldt is a Professor of Urban Economics and Land Development at the London School of Economics, where he directs the MSc Real Estate Economics and Finance (REEF). He is an editor of Regional Science and Urban Economics, associate editor of the Journal of Regional Science, an Affiliate of the Centre for Economic Policy Research (CEPR), the Centre for Economic Performance (CEP), the Spatial Economics Research Centre (SERC), and the CESifo network. As of 2021, Gabriel has published 44 articles in peer-refereed journals, among them general-interest economics journals such as Econometrica, Review of Economics and Statistics, Journal or the European Economics Association, or Economic Journal, as well as in a wide range of urban economics, economic geography, regional science, urban planning, and urban studies journals (e.g., Journal of Urban Economics, Regional Science and Urban Economics, Journal of Economic Geography, Journal of Regional Science, Environment and Planning A, Regional Studies, Urban Studies, International Journal of Urban and Regional Research, among others).

Elisabetta Pietrostefani is a Fellow in Geographic Data Science at the London School of Economics and a Research Affiliate at the Institute for Global Prosperity, University College London. She has a PhD in Planning Policy and Urban Economics from the London School of Economics. Her research focuses on the evaluation of urban policies in multiple geographies, she has analyzed the effects of density policies and urban development, assessed well-being and inequalities in contexts of mass displacement and most recently investigated informal labor markets to evaluate livelihood strategies. Elisabetta has published in economic geography and planning journals including the Journal of Urban Economics and Progress in Planning and has collaborated on several UN reports on urban and migration studies.

Density and the Spread of COVID-19 in Cities: Lessons from the United States and the United Kingdom

Felipe Carozzi, Sandro Provenzano, and Sefi Roth

Abstract

In this chapter, we discuss how population density, the defining feature of cities, shaped the evolution of the COVID-19 pandemic by taking a look at cities in the United States and the United Kingdom. In both countries the spatial distribution of case deaths was similar. Large and dense global cities such as London or New York were hit first by COVID-19. But as the epidemics unfolded, the relationship between density and accumulated COVID-19-related deaths progressively flattened out to the point of disappearing almost completely by the end of the year. The findings illustrated here cast doubts on the widely held notion that COVID-19-related health risks were higher in dense cities throughout 2020.

1 Introduction

Wuhan, Milan, Madrid, New York, Lima... Cities were the collective characters in the story of the first wave of the COVID-19 pandemic that hit the world between late 2019 and early 2020. We know only too well what followed: a year of sombre accounting of cases and deaths, strained health services, and reduced interaction that shook our lives.

The pandemic has brought back an old debate around the death of distance that dominated some discussions in the 1990s, when advances in communication technology led many to envisage a future of sparse habitation and declining cities. This time around, questions about the persistence of working-from-home have rekindled the debate around the demand for space in our urban cores.

F. Carozzi (✉) · S. Provenzano · S. Roth
Department of Geography and Environment, London School of Economics, London, UK
e-mail: f.carozzi@lse.ac.uk; s.provenzano@lse.ac.uk; s.j.roth@lse.ac.uk

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But there is perhaps a more urgent question that we may be able to answer already, a question that is still relevant in a world that continues to be caught in the clutches of the disease. How has density, the defining feature of cities, affected the spread of COVID-19? Have the inhabitants of our large urban areas experienced more adverse consequences of the disease on their health? These questions are older than Zoom calls, RNA vaccines, or Instagram bakers. Whether Justinian's Constantinople, fourteenth century Florence or 1918 Philadelphia—cities have historically been associated with the propagation of infectious disease.[1] In all of those cases, dense urban environments provided a hotbed for infection. Has this also been the case with COVID-19?

In this chapter, we attempt to provide a tentative answer to these questions by looking at data from the United States and the United Kingdom. We select these countries because they had reasonably disaggregated high-quality data on COVID-19 incidence throughout 2020. They are also countries that have been thoroughly affected by the pandemic: with a death toll of over 1500 deaths per million as of March 2021, both were among the 10 countries with the highest reported death rates in the world. Finally, both countries have significant variation in local population densities. We need this variation if we want to study how density shaped the impact of the disease.

Using data for the United Kingdom and the United States, we will provide descriptive evidence to make three distinct empirical points about the relationship between COVID-19 spread and density: (1) locations with high densities were affected first by the disease, (2) local death rates were initially higher in dense cities, and (3) these differences levelled off as the pandemic developed leading ultimately to a flat relationship between accumulated COVID-19 deaths and density by late 2020.

Before turning to these points we first need to decide on how to measure the impact of the disease on human health. Data at different levels of disaggregation is often available for a wide variety of COVID-19-related information for different jurisdictions: confirmed cases, attributed deaths, positivity rates etc. While arguably the number of cases would be the most accurate variable to measure the spread of a disease, reported case numbers depend on testing capacity which may itself be affected by density. Excess deaths would be a suitable alternative but it is usually impossible to calculate these for disaggregated spatial units. In this chapter, we will be looking at death rates—that is, deaths per 100,000 inhabitants. These are arguably less affected by testing capacity and other measurement-specific factors (see Subbaraman, 2020). Unsurprisingly, it can be shown that death rates exhibit a very high correlation with cases and excess deaths.

[1] See Duranton and Puga (2020) and Voigtländer and Voth (2013) for a discussion of the relationship between infectious disease and density in economics. Neiderud (2015) discusses the role of urbanization in the transmission of infectious disease from an epidemiological/medical perspective.

Having settled on our way of measuring the impact of the disease on health across locations, let us turn now to the three substantive points we want to make in this chapter.

2 Dense Locations Were Hit First

In both the United States and the United Kingdom, locations with higher population densities—typically the cores of large cities—were the first to experience a substantial outbreak of COVID-19 in 2020. To provide evidence of this point, we have used daily data on deaths at the level of US counties and UK local authorities to determine when different locations reported their COVID-19 deaths. We illustrate how density shaped the time to first death in Fig. 1.

Panel A of Fig. 1 corresponds to urbanized counties in the United States.[2] In the horizontal axis, we plot a county's population density and in the vertical axis we plot the number of days between the first reported case in the country (20th of January) and the first death in the county. The negative pattern is clear and indicates that denser counties were the first to suffer COVID-19 deaths.[3]

Panel B of Fig. 1 illustrates the relationship between density and the timing of local outbreaks for local authorities (LAs) in England and Wales.[4] In the horizontal axis we represent the week of 2020, as numbered from the 1st of January of that year. In the vertical axis, we represent the median density of the local areas which had the first COVID-19-related death in that week. Therefore, the first column represents the median densities of LAs which reported their first death on week 11 of 2020—ending on the 15th of March—the second column represents median density for LAs whose first death was reported on week 12 of 2020, and so on.[5] Two key insights emerge from this figure. The first is that it only took 5 weeks from the first COVID-19-related death until the point in which all LAs had at least one reported death. This is very different from what was observed for the United States where a small but noteworthy fraction of counties were fortunate to go through the first 5 months of the epidemic without one single COVID-19 death. The second point, which is more relevant for our purposes is that in the United Kingdom we observe a negative

[2] Urban counties are labeled as those which correspond to either a metropolitan or a micropolitan statistical area.

[3] The slope coefficient of the overlaid regression is significant at conventional levels, as can be inferred from the figure. Even if the New York metro area was arguably the first large urban area to have a significant outbreak in the country, it is worth noting that the negative correlation in Panel A of Fig. 1 is not driven exclusively by the 62 counties corresponding to New York State.

[4] Data for the United Kingdom used in this chapter only covers local authorities in England and Wales. Roughly 90% of the UK population lives in England or Wales.

[5] The data representation for the United Kingdom is different from that used for the United States because the UK data is only available at the weekly frequency, and all LAs reported their first death in 1 of 5 weeks. Hence, it is easier to treat time as a category rather than as a continuous variable.

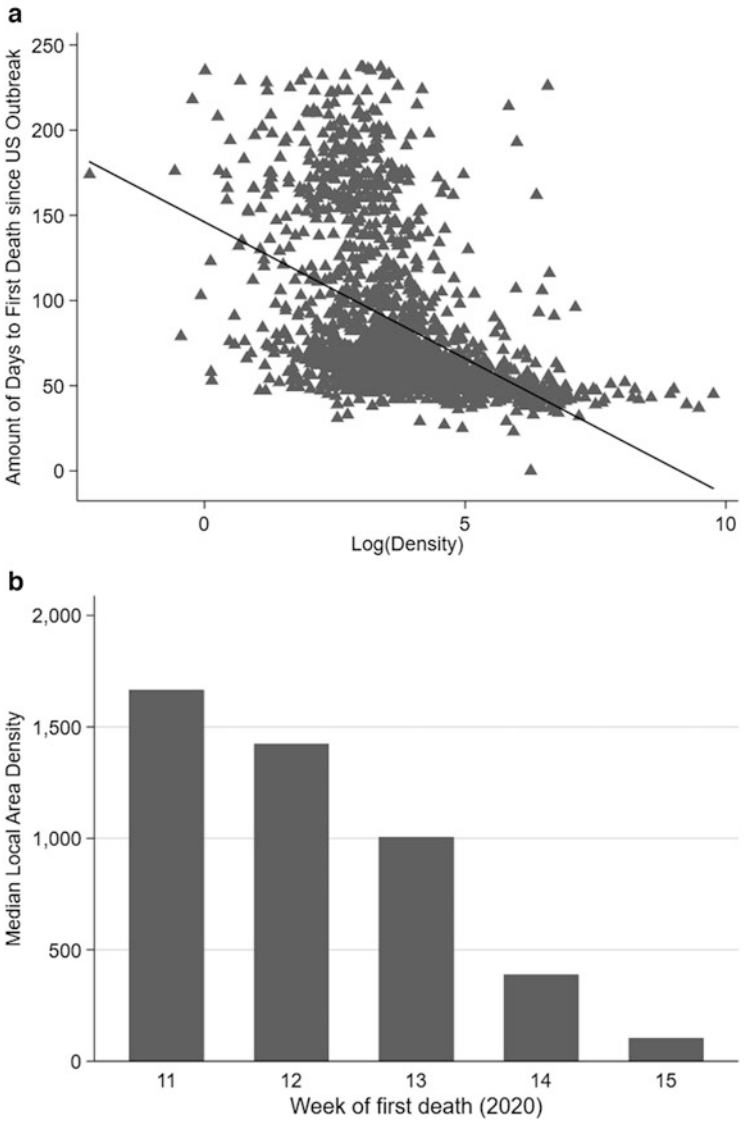

Fig. 1 Time to first death and density. (**a**) United States. (**b**) United Kingdom. Notes: Markers in panel A correspond to 1441 counties in the United States belonging to a core-based statistical area and featuring at least one case by the 1st of December 2020. Data for the United States was obtained from usafacts.org, which gathers data from state authorities. Data for England and Wales was obtained from the Office of National Statistics (Information on Weekly Deaths)

relationship between density and the timing of the outbreak: dense locations—typically in or around large urban areas—were the first to be impacted by the disease.

These patterns are striking but should not be entirely surprising. Large cities are the big communication, travel, and exchange hubs in our societies. They receive more foreign and domestic visitors than more sparsely populated areas, even after adjusting for population levels. We show evidence of this in our technical work on this topic (Carozzi et al., 2020). Regardless of its causes, the fact that dense locations were hit first should be fairly uncontroversial.

3 Local Death Rates Were Initially Higher in Dense Locations

A second striking pattern that was immediately picked up by commentators in the very early stages of the pandemic is that in the "first wave" death rates per capita were higher in dense locations. This is illustrated in Fig. 2 using data for US counties and UK local authorities. The case of the United States is represented in Panel A, where we can see the positive correlation between COVID-19 deaths per 100,000 and density.[6] By the time deaths per day started going down in June/July 2020, the accumulated number of COVID-19 deaths per capita was higher in relatively dense local areas. A similar pattern exists in England and Wales, as illustrated in Panel B of Fig. 2. When cases started to drop consistently in mid-May 2020, accumulated death rates were higher in denser, urbanised locations.

The patterns illustrated in Fig. 2 did not go unnoticed. Back in early 2020, they prompted the first warnings about the effect that COVID-19 would have on large cities.[7]

What generated the positive correlations in Fig. 2? Here is where things get complicated. A certain conventional wisdom would pose that these patterns are the result of faster spread within cities. Density means that people are closer together, and being close together means we can pass on the disease to each other, right? Now, urban level densities do not require people to live less than two meters from each other, so the rather mechanical point is not necessarily true, of course. That said, cities are places of substantial social interaction, so this hypothesis is certainly not unwarranted.

The issue is that the difference in timing reported in Fig. 2 could by itself induce a transient relationship between density and deaths. If dense cities get hit first, then they will necessarily have more deaths in the short run, and this is true regardless of differences in the spread of disease within locations. If we really want to understand the role of density in the spread of the disease, we need to move beyond the short-run or introduce some time adjustment, so that the timing of onset is accounted for.

[6] We use log transformed variables in both axes to deal with the long right tails in the data.

[7] See, for example, Dubner (2020) and Wheaton and Kinsella Thompson (2020).

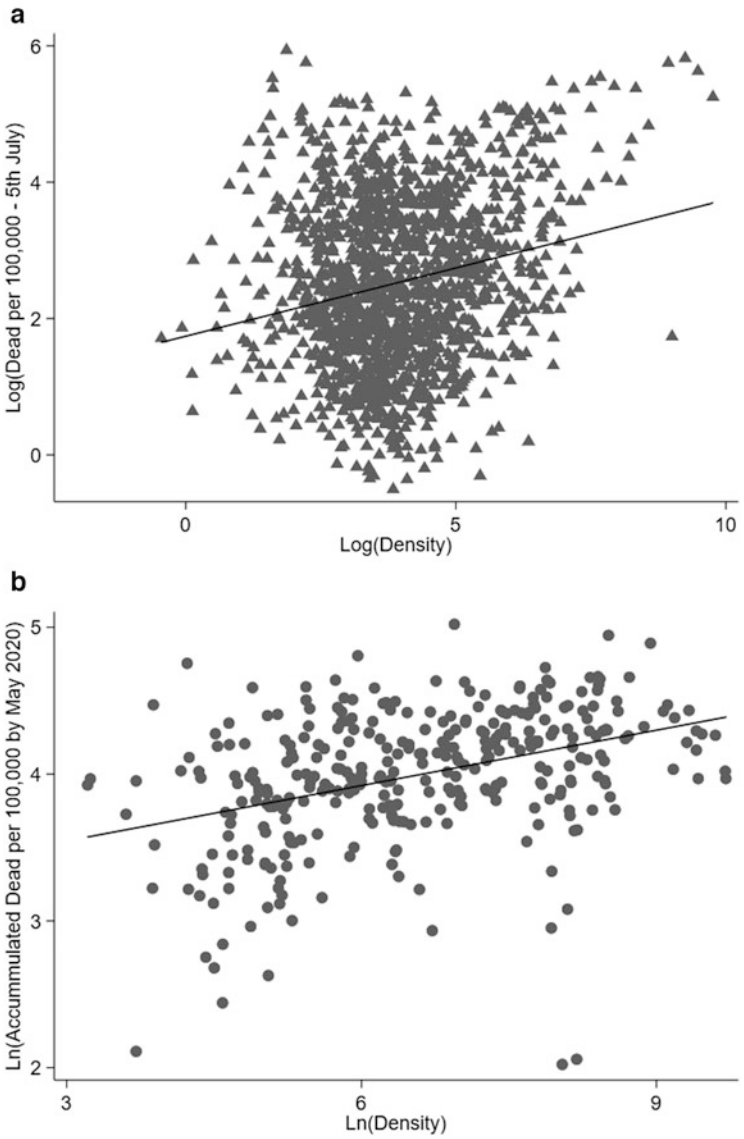

Fig. 2 First wave death rates and density. (**a**) United States. (**b**) United Kingdom. Notes: Markers in Panel A correspond to counties in the United States belonging to a core-based statistical area and having at least one death by the 5th of July 2020. Markers in Panel B correspond to 335 LAs in England and Wales. Accumulated deaths in both vertical axes were computed at the time in which the moving average of confirmed cases started going down in each country. Data for the United States was obtained from usafacts.org, which gathers data from state authorities. Data for England and Wales was obtained from the Office of National Statistics (Information on Weekly Deaths)

4 Differences in Death Rates by Density Levelled Off by December 2020

Our final exhibit goes some way toward showing that the short-run positive correlation above was—at least in part—induced by differences in the time of onset. In Fig. 3, we show the correlations between death rates per capita and density in US counties and UK local authorities. In these cases, we take accumulated deaths per 100,000 in December. We only observe a very tenuous positive relationship, which would be perhaps wholly imperceptible if it was not for the best fit line overlaid on the data. In the case of the United States, the positive slope is not statistically significant at conventional levels. In the case of the United Kingdom, the slope is reduced substantially: in May, a 1% increase in density is associated with a 0.13% increase in the accumulated death rate. For December, this number drops to 0.04%.[8]

What happened? How can it be that, by the end of the year, the relationship between density and COVID-19 deaths became almost flat? Several reasons could be at play, but certainly one important element to take into account is that the initial head-start of places that got hit first was progressively muffled by the evolution of the epidemic in different locations. When 2020 was coming to a close, dense urban areas had not been hit harder—in terms of deaths—than more sparsely populated locations.

5 Final Remarks

The figures presented in this chapter only constitute a descriptive illustration of the patterns relating to COVID-19 deaths and density. It is worth noting that the main message is largely the same whether we use alternative measures of density (e.g., population-weighted densities), data on confirmed cases rather than deaths, time-adjusted variables for the impact of COVID-19 or different controls to account for pre-determined observables. A more rigorous treatment of this issue for US cities can be found in Carozzi et al. (2020).

The message in this chapter can be summarized as follows: densely inhabited locations in and around urban areas were hit first when the pandemic began. Yet as the disease spread to all locations, the accumulated death tolls were not particularly different across the density distribution. Big cities were hit first, but, at least on average, they were not hit harder.

Does this mean that COVID-19 had no differential effect on the livelihoods of urban dwellers? Of course not. Part of the reason why cities could cope with the disease probably lies with the sharp reduction in interpersonal interactions that took place across the board. These interpersonal interactions are what make our cities attractive, productive, and fun, so their curtailment is particularly damaging for

[8] We can directly obtain these elasticities by running a univariate regression of log death rates on log density in each case. The corresponding elasticities are 12.6 and 3.8%.

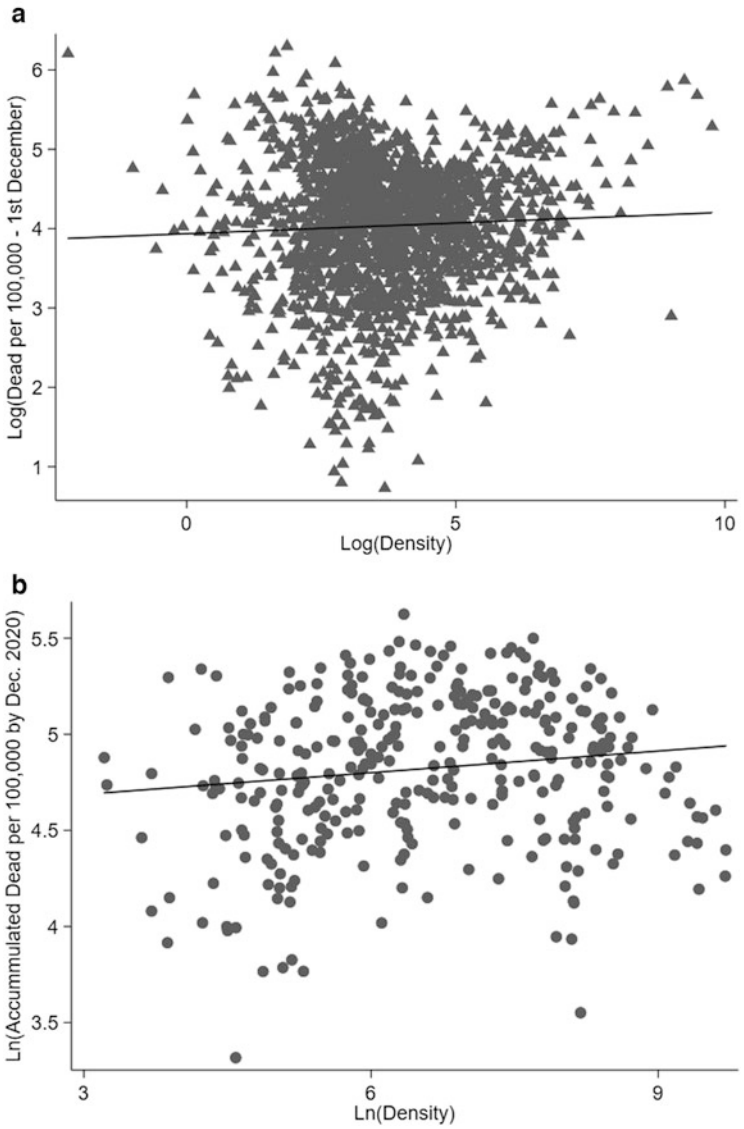

Fig. 3 December 2020 death rates and density. (**a**) United States. (**b**) United Kingdom. Notes: Markers in Panel A correspond to 1441 counties in the United States featuring at least one case by the 1st of December 2020 and belonging to a core-based statistical area. Markers in Panel B correspond to 335 LAs in England and Wales. Data for the United States was obtained from usafacts.org, which gathers data from state authorities. Data for England and Wales was obtained from the Office of National Statistics (Information on Weekly Deaths)

cities.[9] So, much of the interest can and will be said about the short and long-term impacts of COVID-19 on the benefits and costs of urban living. The point in this chapter is more mundane: the direct health impact of the pandemic on cities was not particularly hard. Now that available vaccines are slowly shifting our focus from the health impacts to the socioeconomic consequences of the pandemic, it is perhaps easy to forget that the first red flags about the impact of COVID-19 on urban areas had more to do with health than with the consequences of working from home or changes in the demand for space.

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Felipe Carozzi is an Assistant Professor in Urban Economics and Economic Geography at the London School of Economics. He is also director of the PhD in Economic Geography at the same institution. He has published work on housing markets, political economics, and urban economics, including articles in the Journal of Public Economics, Regional Science and Urban Economics, the Journal of Urban Economics, and the Journal of the European Economic Association. He completed his PhD in Economics in 2015 at CEMFI.

Sandro Provenzano is a PhD candidate in Economic Geography at the London School of Economics. His research focuses on urban and developing economics as well as spatial big data. Prior to pursuing his PhD he completed two Master's Degrees in Economics (Stockholm School of Economics) and International Economic Policy (Sciences Po Paris). In addition, he worked as a consultant for 505 Economics, external data analyst at eXplain, research intern at Deutsche Bundesbank, and at CESifo Group Munich.

Sefi Roth is an Assistant Professor of Environmental Economics at the Department of Geography and Environment, London School of Economics. He is also an Associate of the Grantham Research Institute on Climate Change and the Environment and a Research Affiliate at IZA. Since 2020, Sefi is the director of the MSc in Environmental Economics and Climate Change at the LSE and a member of the UK Clean Air Programme Steering Committee.

[9] In Carozzi et al. (2020), we show mobility within US cities declined more sharply in denser cities between March and May of 2020.

The Future Viability of City Networks

Guido Spars

Abstract

Since the 1990s, both formal and informal consensus-based procedures have been used in spatial planning policy to strengthen regional collaboration between cities. These include, for example regional conferences, round tables and also city networks and alliances. This chapter examines what networking opportunities are available for cities and how these networks can be classified. Examples such as the Eurocities network, the WHO Healthy Cities Network or neighbourhood city networks like the Bergisch triangle are also discussed. It is explained how regional cooperation can be strengthened by city networks and alliances, especially in times of crisis. Opportunities for action and potentials, that cannot or only partly be exploited by one city, are a good incentive to improve regional cooperation. Another question the paper explores is that of the future viability of city networks. In the post-COVID-19 era, cities need to prepare for future pandemics and learn from each other's experiences more quickly. For such joint preparation—based on the rigorous evaluation of the COVID-19-experience—city networks can provide a suitable platform, where competences and resources can be bundled and approaches can be explored in a larger spatial perspective.

G. Spars (✉)
Fakultät für Architektur und Bauingenieurwesen – Bergische Universität Wuppertal, Wuppertal, Germany
e-mail: guido.spars@bundesstiftung-bauakademie.de

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1 Connecting Cities: City Networks and City Alliances

City networking has been discussed for many decades both at the European level and within individual nation states (Kern & Bulkeley, 2009). However, there are many forms of collaboration under the heading "city networks", and it is worth, from the outset, distinguishing the so-called "passive networks" (Ritter, 1995) from the active ones. Passive network connections may exist between cities solely through functional links (commuter flows, leisure and local recreational movement) without being intentionally designed or planned. An active city network is consciously developed and shaped through political planning. The planning and decision-making authorities of the participating cities decide to collaborate because they expect to benefit from it, with each city deciding independently on the goals and issues to be included in the collaboration. In these cases, we speak of strategic city networks. This also includes city networks that connect cities over long distances, such as the international Eurocities network (Eurocities, 2021) or the WHO Healthy Cities Network (WHO, 2021), and those that organise strategic and concrete collaboration between neighbouring cities.

The Eurocities network now links more than 190 cities from 39 European countries. The cities in the network share the vision of a better quality of life in all member municipalities. There are six common goals, ranging from engaging people in an inclusive society, promoting a prosperous local economy, creating a healthy environment with vibrant and more open public spaces, addressing global challenges and achieving city governance that is fit for the future (Eurocities, 2021).

The WHO Healthy Cities Network is organised through regional offices (in this case, the European office). However, there is also a Healthy Cities Network of the Federal Republic of Germany, which comprises around 90 cities, regions and districts (Gesunde Städte-Netzwerk, 2021). A symposium was held in December 2020 on the topic "Gesunde Städte in Zeiten einer Pandemie: Schutz der Bevölkerung und Wiederaufbau zum Besseren" (Healthy cities in times of pandemic: protecting communities and building back better), which resulted in a political declaration by the Healthy Cities Network of the WHO European Region (WHO, 2020). This declaration makes it clear that this network of cities functions, on the one hand, as a platform for exchange and, on the other, as a community representing the interests of the member cities vis-à-vis national governments and the global community. Regional networks within Germany can also be established as part of the German branch of the Healthy Cities Network.[1] These networks are best classified as working or discussion groups for various forms of collaboration on joint regional development (Fig. 1).

[1] E.g. the Rhein-Main-Neckar-Lahn-Saar region or the North Network. There is also a network in the Rhineland-Palatinate-Saarland region, a regional network in Berlin, one in Brandenburg and one uniting the Bavarian cities.

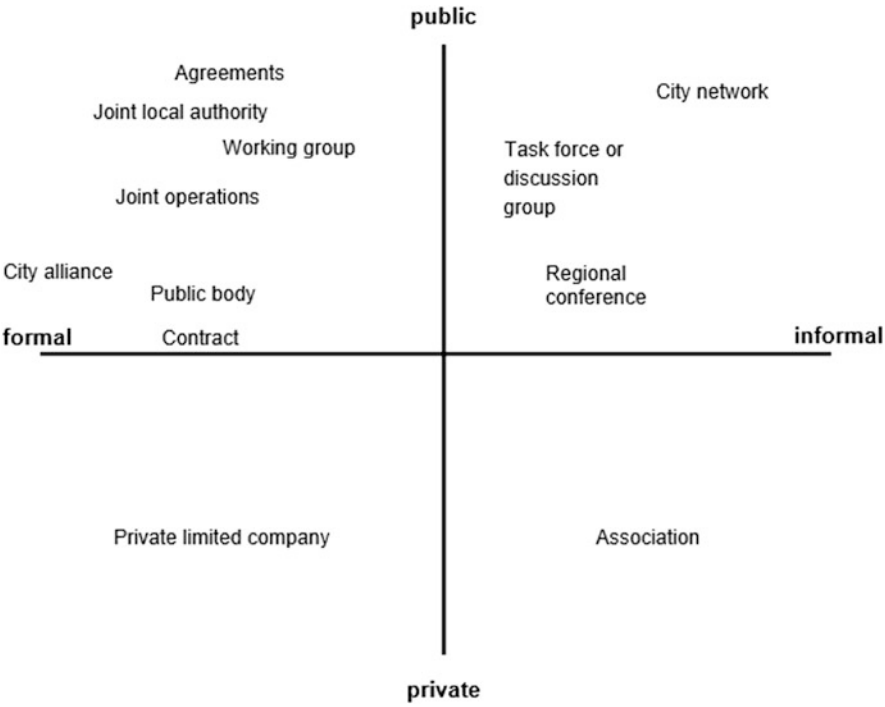

Fig. 1 Forms of regional cooperation. Source: Based on Zimmermann (2018: 1217)

Figure 1 shows other forms of collaboration between cities within a region. These are formal or informal associations of cities that have interests that are spatially or functionally aligned.

City networks can be distinguished from city alliances in terms of the voluntary nature of the collaboration and the stronger or lesser involvement in spatial planning policy (Bathelt & Glückler, 2018). The latter can also be called "normative city networks" (Priebs, 1996), as cooperation in these city alliances is advised by law or regulations for the purpose of regional and state development. Examples of city alliances would be those covering Nuremberg-Fürth-Erlangen and Friedrichshafen-Ravensburg-Weingarten.

City alliances are "much more closely integrated into spatial planning policy" than city networks and their "division of functions (is) dictated by state planning" (Bathelt & Glückler, 2018: 141). With the help of city alliances, local authorities are therefore more or less obliged to perform central general interest services functions jointly in order to maintain the quality of services in the face of tight public budgets or declining population figures. This format is therefore more frequently used in regions affected by shrinkage (Zimmermann, 2018).

2 City Networks and Inter-municipal Cooperation in Research and Funding Programmes

The Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR), and thereby the Ministry of Construction (currently the Federal Ministry of the Interior), launched a model project "FORUM Städtenetze" (City Networks FORUM) between 1998 and 2003, which was linked to a research field of the same name in the urban development research programme "Experimenteller Wohnungs- und Städtebau" (Experimental Housing and Urban Development). While the latter explicitly focused on initiating inter-municipal collaboration initiatives, the aim of the FORUM was to organise the exchange of experience between existing and new city networks.

In the meantime, inter-municipal cooperation is also possible within the framework of urban development funding and also makes it possible to fund city networks (BBSR, 2018). This can be done, for example for smaller towns and municipalities within the framework of the urban development funding programme "Kleinere Städte und Gemeinden—überörtliche Zusammenarbeit und Netzwerke" (Smaller towns and municipalities—collaboration and networking above local level) launched in 2010. "Ziel des Programms ist es, kleinere Städte und Gemeinden als wirtschaftliche, soziale und kulturelle Zentren zu stärken und als Ankerpunkte der Daseinsvorsorge auch für die Zukunft handlungsfähig zu machen" (The aim of the programme is to strengthen smaller towns and municipalities as economic, social and cultural centres and to make them capable of acting in the future as anchor points for services of general interest) (BBSR, 2019: 9). Demand-oriented adaptation and modernisation of common infrastructures is a central baseline of the funding.

"Interkommunal bedeutet in diesem Zusammenhang, dass mindestens zwei Gebietskörperschaften auf der kommunalen Ebene (Städte, Gemeinden, Gemeindeverbände) an der Kooperation beteiligt sind" (Inter-municipal in this context means that at least two regional bodies at local authority level (cities, municipalities, associations of municipalities) are involved in the collaboration) (BBSR, 2018). This involves horizontal forms of collaboration, preserving the autonomy of the municipalities. Local authorities can join together to provide services to which they are entitled or obliged to provide. In doing so they generally go through a "process of institutionalisation" (Diller, 2002: 146 ff.). This commitment gradually increases before leading to real cooperation in which the participating local authorities work together in many fields. This then goes beyond special purpose associations, which often have a rather monothematic orientation, and becomes more comprehensive and integrated in terms of content (e.g. through joint concepts). This form of regional collaboration also enables a more effective representation of interests in dealings with higher-ranking regional authorities and institutions. This applies both to the pooling of political influence and to the requirement of the state, federal government and EU to avoid inter-municipal competition when providing financial support for individual projects.

3 Regional Collaboration Based on City Triangles

However, the road is long from loose, informal collaboration in individual fields of activity to an alliance of cities with a clearly defined division of labour and corresponding regional planning requirements for the participating cities. This is demonstrated by the Bergisch triangle, for example. The informal merger of the three adjoining cities of Wuppertal, Remscheid and Solingen dates back to the first third of the twentieth century. Discussion, not only about possible levels of collaboration, but also about the spatial form and even a possible merger of the three cities has germinated time and time again. In the field of tourism, cooperation between the three cities began as early as the second half of the twentieth century.

The structural development programme of the state government of North Rhine Westphalia, "REGIONALE 2006", ultimately provided an additional boost to the professionalisation of the collaboration.[2] Now—in addition to aspects such as a joint police organisation, the merger of the adult education centres of Wuppertal and Solingen, a common telephone service centre and the merger of the veterinary and food offices in all three cities—there is a Bergische Struktur- und Wirtschaftsförderungsgesellschaft mbH (BSW) (the Bergisch Structural and Economic Development Corporation), which initiates and implements regional projects. In the regional context, BSW deals with the topics of economic development, structural development and tourism (BSW, 2021). It is also responsible for regional marketing and the promotion of the labour market and employment. The overall aim of collaboration in the Bergisch triangle is to better position the region to face competition and major challenges by improving administrative collaboration, cooperation within the region and visibility to the outside world.

The voluntary nature of collaboration can lead to a certain fragility in the cooperation process, especially if the cities are of different sizes, are affected differently by certain economic and demographic trends, or if benefits from cooperation develop differently. In this vein, the chamber of commerce and industry for Wuppertal-Remscheid-Solingen (2012: 15) writes that "*die notwendigen Veränderungen in der regionalen Zusammenarbeit (…) eine große Gestaltungsaufgabe insbesondere auch für die politisch Verantwortlichen in den einzelnen Kommunen (bedeuten). Dies setzt allerdings voraus, dass auch die Politiker den Ernst der Lage erkennen. Mit verbindlichen Strukturen für die verstärkte Zusammenarbeit könnte unsere Region für Aufmerksamkeit sorgen und auch attraktiver für neue Investoren werden. Gelingt dies nicht, werden die drei bergischen Großstädte mittelfristig im globalen Standortwettbewerb nicht*

[2]The REGIONALEN (an artificial word made up of the components region and biennial) are an instrument of informal planning and cooperative regional development specific to North-Rhine Westphalia. The REGIONALEN are also based on voluntary cooperation and territorial delimitation. However, it is also based on a "consistent realisation of the principle of competition" between regions for funding, as well as on a clear time limit and orientation towards a presentation year. A separate organisational unit (REGIONALE agency) is usually set up for this purpose (Danielzyk & Sondermann, 2017).

bestehen". ("the necessary changes in regional collaboration (. . .) represent a major task, particularly for people carrying political responsibility in the individual municipalities. However, this presupposes that politicians recognise the seriousness of the situation. With binding structures for closer collaboration, our region could attract attention and become more attractive for new investors. If this does not work, the three major cities in the Bergisch region will not survive in the medium term given the global competition".)

In the meantime, cross-border metropolitan regions, such as Euroregio Meuse-Rhine with 3.9 million inhabitants and the Trinational Region Upper Rhine with 5.9 million inhabitants, have been formed in the border areas to neighbouring countries. There are also what are known as regiopol regions in areas with medium-sized core cities (Hartz, 2018). The advantages of such mergers in cross-border metropolitan regions lie essentially in a better spatial allocation of labour potential, but also in greater freedom of choice for the inhabitants of border regions with regard to their supply of goods for medium and long-term needs, leisure activities and housing. Cross-border health care—especially in times of pandemic—is also useful here, especially if this could counteract capacity bottlenecks for intensive care beds beyond national borders. That said, disadvantages also became apparent during the pandemic when European governments closed borders to some neighbouring countries during the first wave, thereby interrupting well-established cross-border work and supply activities and making commuting difficult or even impossible. This caused economic damage with both short- and long-term consequences, given that the experience has become etched in the collective memory of the border population.

4 Future Viability of City Networks

The main challenges facing city networks and regional cooperation include "die Bevölkerungsentwicklung, die vielerorts knappen Ressourcen, die wirtschaftliche Entwicklung und der wachsende Wettbewerb der Regionen, aber auch Fragen hinsichtlich zunehmender wirtschaftlicher und sozialer Disparitäten und der sozialen Stabilität" (population development, the scarcity of resources in many places, economic development and growing competition between regions, but also issues regarding increasing economic and social disparities and social stability) (BBSR, 2018: 14). Thus, many future challenges for spatial and urban development in the post-COVID-19 era will go hand in hand with the need for enhanced regional collaboration. As if under a magnifying glass, the COVID-19 crisis has highlighted the vulnerability of community life in our cities and exacerbated many existing problems. These include health care, social problems, but also economic development, especially in severely affected sectors such as hospitality, tourism and the hotel industry, the leisure industry, as well as art and culture.

Even if old patterns of human movement in public spaces and the use of these spaces will gradually re-emerge after the crisis, lessons should nevertheless be learned.

Many "good practices" in cities such as Tübingen and Rostock have shown that exchange between cities, e.g. through city networks (also on an international scale), can help mitigate the effects of a pandemic. Both cities initiated model projects, such as targeted testing, very early in the second lockdown to open retail and other city facilities earlier. Even small ideas are helpful in times of crisis, such as family advice in times of COVID-19, a joint service by the cities of Bad Honnef and Königswinter, providing support and advice for parents and children. In the post-COVID-19 era, cities need to prepare for future pandemics and learn more quickly from each other's experiences. In anticipation of such preparation—based on the rigorous evaluation of the coronavirus experience—city networks can provide a suitable platform. This allows competences and resources to be pooled and approaches to solutions explored in a wider spatial context.

Health care, especially when it comes to intensive care, does not function locally, but regionally. Patients in intensive care with COVID-19, for example were and are usually transferred to the nearest hospital with available beds. These clinics may be spread over their own district and therefore require regional organisation; available capacity may, however, also be found beyond the state border. Patients from the district of Steinfurt in North Rhine-Westphalia, for example have, at times, been taken to the southern part of Lower Saxony (WDR, 2021). The more intensive care facilities in hospitals are at maximum capacity, the greater the distances to be travelled to accommodate these patients. The regional organisation of patient care has been stunningly obvious during the pandemic.

It may also prove more sensible to organise preventive health care strategies on a regional scale, as care—especially that requiring a higher degree of specialisation—can be better tailored to regional needs. A regional development strategy also appears necessary in view of the economic impact, social disparities and instabilities that have arisen as a result of the pandemic and will certainly continue to have an impact. Social, educational and cultural infrastructures, for example can be better organised and maintained through a regional pooling of resources.

In particular, the scope for action and the potential that cannot be exploited, or can only be partially exploited by one city alone, are good reasons for improving regional collaboration. A single city can hardly cope with the future demands of intraregional mobility on its own. The functional linking of regional spaces has continued to evolve. Mobility options and digitalisation processes—especially during the pandemic (e.g. people working from home)—mean that home and work locations can once again be somewhat geographically dispersed. This of course then leads to more commuting in the respective region, a development that could change in the course of a crisis. Consequently, when it comes to providing functions for living, working and leisure (e.g. cultural facilities and recreational areas) city centres, suburbs and greenbelt regions need to coordinate the geographical division of labour. The provision of food and other ecological functions and services (e.g. ecosystem services) are generally provided by the peripheral areas for more central areas. City centres, on the other hand, provide numerous functions such as education, work, housing, shopping, culture etc. for the more peripheral areas.

Efficient organisation of these services in a wider region is an important prerequisite for the developmental success of the region.

Today, the housing market, in particular, can only be meaningfully understood and studied in terms of its regional context and this division of labour. The migration of households to green belt areas because of the higher costs of housing is just one currently striking aspect of this relationship. Often, growing and shrinking local housing markets are located close to each other, which begs the question of how to deal with such spatial divergences in a meaningful way as a region in view of resource, infrastructure and mobility issues (Spars & Voigtländer, 2015). This also concerns the development of technical and digital infrastructures in the region, sustainable energy supply and the regional organisation of material cycles in terms of resource efficiency. With regard to climate policy, Kemmerzell and Tews (2014) note that membership of city networks also serves to represent interests or recruit project partners for funding applications.

It is precisely the establishment of a more powerful representation of interests in dealings with higher-ranking regional authorities or institutions that city networks make possible. This includes the pooling of political influence and resources in undertakings with the state, federal government and the EU, and it also has the appeal that municipalities which might otherwise be in competition have agreed on joint concepts that can then be promoted.

Taking account of all aspects, therefore, there is a growing need—especially in times of crisis—to strengthen regional collaboration in the development of space and in the efficient provision of public services. However, it is also apparent that committed initial efforts to develop the concept of city networks is going to be difficult and will shake up the autonomy of cities. Further development towards city alliances which are more binding and more strongly integrated into the regional planning policy of the respective state is also a possible option and one which is being pursued more strongly in some states, such as Hesse, Thuringia and Bavaria, than in others. Diller (2018) notes that instruments such as city networks must in many cases be seen as having only limited viability given the lack of political commitment.

In 2016, the Ministerial Conference on Spatial Planning wrote in its Guiding Principles and Action Strategies for Spatial Development in Germany that the "Ausbau von Ansätzen interkommunaler und regionaler Zusammenarbeit bei der Gewährleistung der Daseinsvorsorge und Ausbau sowie Verstetigung von Stadt-Land-Partnerschaften (...) im Rahmen von Städtenetzen und Zentrenverbünden" erfolgen soll (expansion of efforts towards inter-municipal and regional collaboration in guaranteeing services of general interest and the expansion and consolidation of urban–rural partnerships (...) should take place within the framework of city networks and centre alliances). This should continue to be supported by funding programmes already mentioned above (e.g. urban development funding). In principle, therefore, city networks offer a good opportunity to face future challenges with a common, regional strategy. However, as the city network progresses, there seems to be a need to make this informal collaboration more binding, with the need for consensus essential for its continuation. However, this is difficult to organise.

Here, continued development in the direction of a city alliance may be the right answer for some cities.

Overall, there is "eine große inhaltliche und organisatorische Bandbreite in der Anwendung interkommunaler Kooperation" (a wide range of content and organisation in the application of inter-municipal cooperation) (Zimmermann, 2018). In view of the challenges that lie ahead, cities would be well advised to consider all reasonable avenues of collaboration and to approach regional partners. But research is also called upon to deal more intensively with the concepts of city networks and alliances. In this respect, Nischwitz et al. (2020) show how governance structures and processes in regions can be modelled and analysed and how lessons can be learned for the future of collaboration in the regions.

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Guido Spars is a Real Estate Economist and directs the research department "Economics of Planning and Building" at the Faculty of Architecture and Civil Engineering at the University of Wuppertal. From September 2021, Guido will be the founding director of the Bundesstiftung Bauakademie in Berlin.

Part III

Implications for Housing and Hotel: Cities to Live

Living in the City: Or Rather Nearby?

Tobias Just and Franziska Plößl

Abstract

According to the Europe-wide survey, respondents expect a significant increase in demand for residential space in the wake of the COVID-19 pandemic. Within core cities, this additional demand cannot be fully met and the desire for more open space in residential areas could see cities expanding beyond their edges. Conversely, the hotel industry is expected to consolidate, with hotels catering to leisure tourism likely to see a faster recovery. The extent to which hotels can be repurposed, and thus the increased demand for space for other uses met, depends in part on the future legal planning framework. The greatest conversion potential does not lie in core cities, but rather in interconnected belts.

1 Introduction

Housing cannot be replaced (in the short term) even during a recession, so adjustments in housing markets are often slower than in commercial property or capital markets. If the shock occurs during a financial crisis—which makes access to debt capital significantly more difficult, residential property markets can also undergo sharp short-term price fluctuations. This has been recently evidenced by many European countries following the economic and financial crises after 2007 (Ambrose et al., 2013; Jorda et al., 2017).

As illustrated in chapter "The Preservation of Economic Structures as a Main Challenge of Urban Development" (Oberst, 2021), the early phase of the pandemic was characterised by a very high level of uncertainty. This was also reflected in the

T. Just · F. Plößl (✉)
IRE|BS International Real Estate Business School, University of Regensburg, Regensburg, Germany
e-mail: tobias.just@irebs.de; franziska.ploessl@irebs.de

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varying expectations of real estate market players. Yet, there were fears that the plausible restrictions on supply and decreasing demand would lead to significant income losses, and that residential property prices could come under massive pressure as a result. The Empirica Institute published a study that examined short- to long-term effects, showing expected 10–25% price declines in the housing market in the medium term (Braun & Simons, 2020). Almost at the same time, IW Cologne published a study—with a much less dramatic title—in which the base scenario featured largely stable housing prices for the pandemic year. But also in this latter study, assumptions of the downside scenario led to average price declines of 17.43% (Oberst & Voigtländer, 2020).

In the further course of the pandemic, however, it became clear that such scenarios were too pessimistic for the residential property markets in Europe. On the one hand, European governments quickly put together aid packages (Almeida et al., 2020; Bernoth et al., 2020; Demary et al., 2020; Fornaro & Wolf, 2020; Ozili & Arun, 2020; Schnöpflug, 2020) that ensured liquidity at company level, e.g. stabilised by short-time working programmes.[1] Moreover, analyses of past pandemics revealed that although transaction volumes typically declined, rent and purchase price declines remained manageable. Just (2020) as well as Wong (2008) show this for the housing markets in Hong Kong during the SARS-I pandemic 2003/2004, while Francke and Korevaar (2021) could find comparatively small price adjustments in the available price data for the plague and cholera epidemics in Amsterdam and Paris in past centuries, although health risks, health care needs and hence the mortality risk during such periods were significantly higher than during the 2020 COVID-19 pandemic.

Needless to say, it would be too simplistic to transfer the adjustment processes of previous pandemics to the current situation: to start with, the stability in Amsterdam and Paris in earlier centuries was primarily due to the pressure of immigration from rural areas. Today, this immigration pressure is much lower because overall living conditions have improved, and the proportion of the rural population has sharply fallen. Secondly, the situation in Hong Kong cannot simply be transferred to typical European cities due to the topographical peculiarities and the associated scarcity conditions—let alone the special legal status of Hong Kong almost 20 years ago.

In the meantime, however, it can be said that both rents and prices in Europe continued to rise in most countries in 2020. Figure 1 shows that the price index for residential real estate in Europe (Eurozone) has been increasing continuously since 2014. While the index in Germany was 133 in the last quarter of 2019, it rose to 144 at the end of 2020; similar price increases can also be seen in the Netherlands.

In many cases, prices rose faster than rents. Apparently, the investment pressure of private and institutional investors remains high, and the search for stable

[1] For example in Denmark, Germany, France, Greece, Ireland, Italy, the Netherlands, and Austria; see also the Policy Tracker of 197 countries of the International Monetary Fund at https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19 or the COVID-19 Government Response University of Oxford tracker for more than 180 countries at https://www.bsg.ox.ac.uk/research/research-projects/covid-19-government-response-tracker.

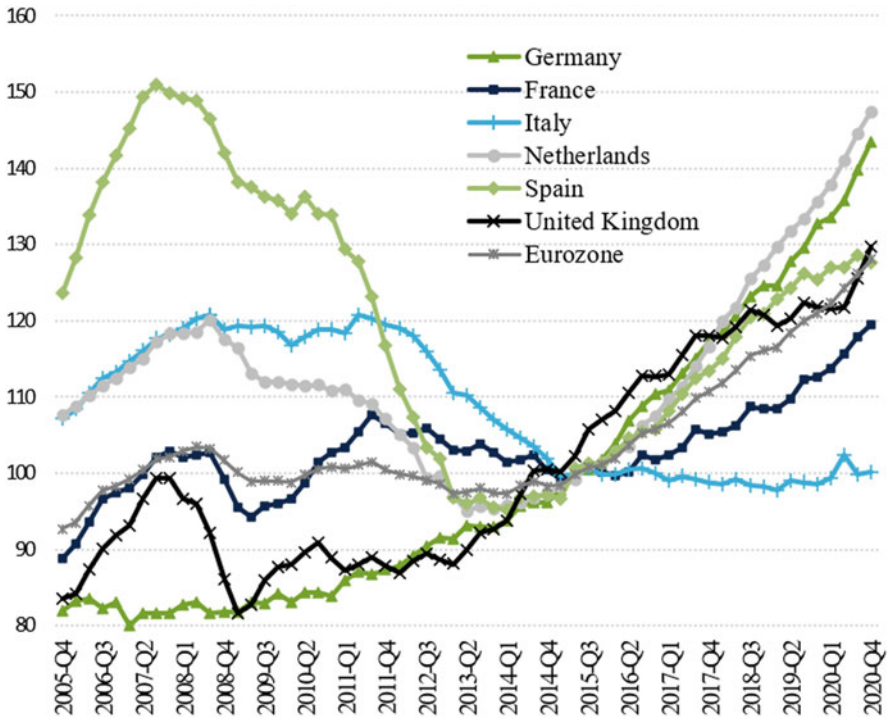

Fig. 1 Price indices for residential properties 2005–2020. Notes: Index, 2015 = 100; Source: BIS (2021)

investments will lead them to residential property investments in 2020/2021 as well. This is also reflected in the survey results: to date, investors associate residential property investments with stability and security (31% of those surveyed).

For hotel real estate, however, the pandemic meant a massive turning point, as hotel accommodation and events were cancelled in many cities or barely held for many months. For hotel operators, sales all but vanished while incurring additional costs for hygiene measures. In hotel businesses in Germany, for example, the number of overnight stays fell from 201 million to 104 million in 2019 (Destatis, 2021). In Spain, the number of overnight stays fell dramatically during this period: from 343 million to 92 million (Instituto Nacional de Estadística, 2021).

This chapter presents the main results of the survey on the residential and hotel market segments.[2]

[2]Together with the Product Councils of ULI Germany, an extensive questionnaire was drawn up in German and English, which was answered by a total of 421 participants in Europe in March and April 2021.

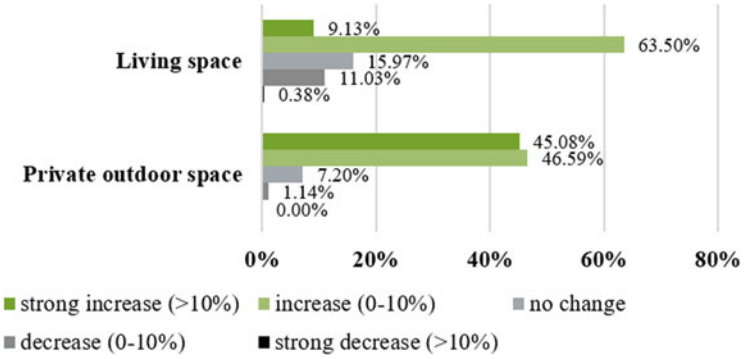

Fig. 2 Development of residential space per capita and private outdoor space. Notes: Own data collection on the question "How will the average residential space per capita develop?" or "How will the demand for private outdoor spaces develop in new construction projects?"; 2.59% or 2.22% of the participants in the survey on the residential asset class did not provide any information

2 Residential Segment: Moderate External Pressure

Overall, questions on the residential asset class were answered by 272 participants. This segment saw the strongest response, followed by office. In free-text answers on the "normality" of this asset class after the pandemic, 513 entries were registered; this was also one of the highest values within the different asset classes.

Most participants expect a further increase in the total demand for residential space in all regions[3] over the next 10 years (72.63%); only 11.5% of all participants expect a decline in the demand for residential space. In the opinion of survey participants, this increase in demand for space is moderate (the most frequent answer falls in the category 0–10%). This assessment is also supported by the free-text answers: more than every fifth answer notes that more space is expected indoors, often adding that this is driven by additional work-related space (work from home).

The demand stimulus for outdoor spaces is assessed to be even stronger. Almost half of all participants see a strong increase in demand over the next 10 years, i.e. an increase exceeding 10% (see Fig. 2).

If the assessment of survey participants—namely that the increased demand for indoor and outdoor space is more likely to arise in agglomeration areas than in rural ones—comes to fruition, this will pose significant challenges for the cities unless space can be created in other asset classes by releasing space or by building vertically. For rural areas, a decline in demand is even more likely. The presumed flight from core cities is not reflected in the survey values; at best, there is a slight tendency for the expected increase in demand in agglomeration areas to be stronger

[3] Most respondents were German-speaking, so the findings refer primarily (but not exclusively) to German-speaking regions within Europe.

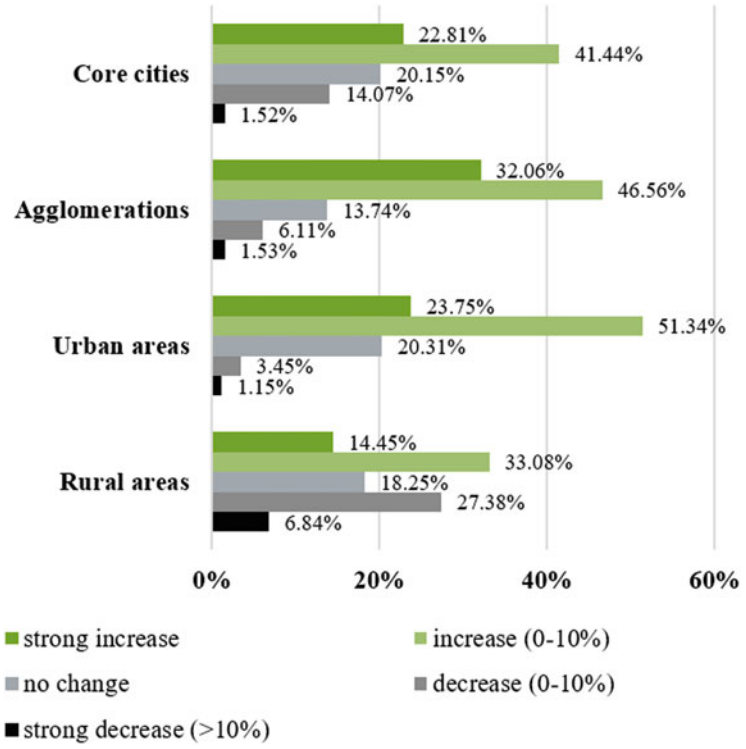

Fig. 3 Outlook for demand for residential space over 10 years. Notes: Own data collection on the question "Please estimate the demand for residential space in the following regions over the next 10 years."; 2.59%/2.96%/3.33%/2.59% of the participants in the survey on the residential asset class did not provide any information; definitions according to the Federal Institute for Building, Urban and Spatial Research (BBSR): agglomerations—regional centre over 300,000 inhabitants, urban areas—regional centre over 100,000 inhabitants, rural areas—without regional centre over 100,000 inhabitants

than in core cities. Ultimately, this implies that respondents expect the immediate vicinity to benefit the most (see Fig. 3).

This is entirely in line with the findings of Carozzi et al. (2021, chapter "Density and the Spread of COVID-19 in Cities: Lessons from the United States and the United Kingdom") as well as from Eisfeld and Just (2021) and those of BBSR (2021) in that the health risk over all three waves in high-density metropolitan areas does not exceed that of less densely populated areas. However, there is a difference in living conditions within these metropolitan areas. Cramped living conditions and professional activities with many social contacts increase the risk of infection. In this respect, the expectation that more indoor and outdoor space will be in demand is inevitably limited by the availability of space in core cities. This would divert demand to the next best alternative, which would be communities in the outskirts rather than rural areas.

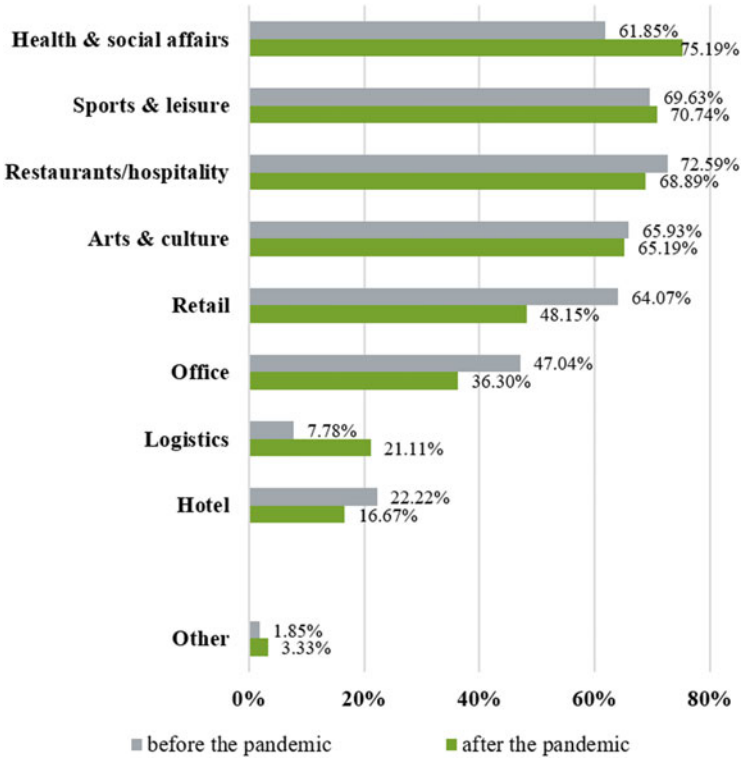

Fig. 4 Positive synergies for residential use. Notes: Own data collection on the question "Which uses generated/generate positive spillover effects for residential use?"; multiple choices possible; 4.07% of participants in the survey on the residential asset class did not provide any information; most frequent mentions for other before the pandemic: craft, educational institutions, food retailing; most frequent mentions for other after the pandemic: public spaces and green spaces, educational institutions

This is especially true because survey participants stated that access to health care facilities and social gatherings would become more relevant to select their place of residence, and that proximity to retail properties and offices could become less relevant (see Fig. 4).

Figure 5 shows that a long-term strengthening of rural areas is rather unlikely: although the category with the greatest relevant gain is "green and open spaces", the second and third-placed categories "child care" and "local supply" require advantages that are customary of urban agglomerations. This also suggests that it is less the rural than the urban areas on the outskirts of core cities that could benefit most from demand shifts. Overall, it becomes clear that survey participants start out with a higher estimate of public spaces and social interaction qualities. This applies not only to open spaces but also to care offers etc.

All other things being equal, such expected growth in expansion requests is likely to exacerbate the problem of affordable housing in metropolitan areas; only a few

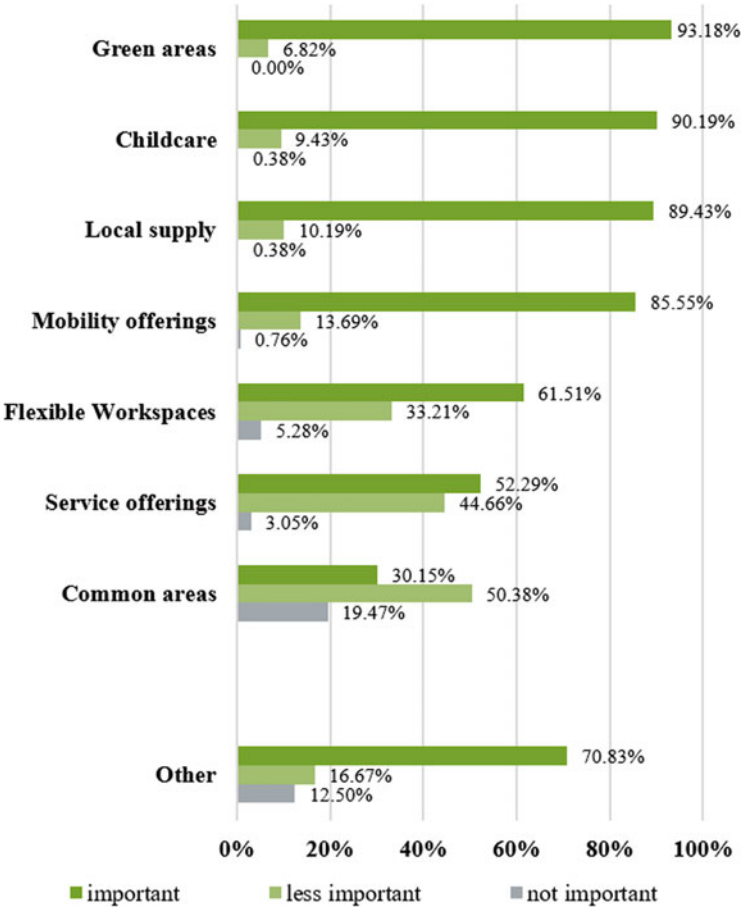

Fig. 5 Significance of the functions in district development. Notes: Own data collection on the question "How important are the following functions in the development of the district in the future?"; 2.22%/1.68%/2.59%/1.86%/2.96%/2.96%/91.11% of participants in the survey on the residential asset class did not provide any information; most frequent mentions for other: social facilities (young and old), sports facilities, and urban gardening

survey participants indicated that sharing concepts should make a significant contribution to easing this conflict situation.

Ultimately, the expectation of further space expansions is associated with the fact that residential real estate will remain a stable asset class. In the free-text answers, every fifth answer was aimed at precisely this notion of stability; no other asset class has mentioned stability or security so often. In negative terms, this implies sustained upward pressure on house prices and likely declining rental yields. But there is also a positive side, namely that a lot of private investment capital should be available for converting metropolitan areas into residential space. This capital would then have to

be channelled into new and conversion projects and less into the acquisition of existing properties.

3 Hotel Properties: Only Gradually Out of the Woods

In the real estate climate index that bulwiengesa calculates monthly for Deutsche Hypo, the sub-index for hotel properties fell by almost 100 index points between February 2020 and November 2020. This is indeed the lowest value ever reported for an asset class in Germany since the introduction of this climate index (to 13.9 points)[4] (bulwiengesa & Deutsche Hypo, 2021). In retail, values also slipped in the wake of the pandemic, but not as jerkily and violently as for hotel properties.

Although the hotel climate has recovered somewhat since November 2020, the more recent lockdown phases have always entailed setbacks. Thus, the growth threshold is still a long way off by mid-2021 (May: 39.9 index points). Although many hotel property markets had already passed their cyclical peak—as measured by this climate index—before the pandemic, the hotel industry was far from a recessive market situation.

Most survey participants expect a further recovery, but not a comprehensive and rapid return to previous occupancy levels. Of the 135 free-text answers on the hotel real estate segment, almost a third of them fell into the "consolidation" category. This was by far the most cited category; terms such as conversion or refurbishment, which could also follow this market pressure, were not even considered here.

Conversely, survey participants were noticeably more optimistic about the leisure hotel industry. Business hotels devoted solely to business travellers would therefore have to wait significantly longer for a recovery. In the opinion of study participants, business appointments will return to pre-crisis levels more slowly even after the lockdown phases have ended (see Fig. 6). Here, "new" communication channels tried and tested during the pandemic should be able to partly instil a permanent change in behaviour. There would be fewer conference and trade fair visitors and fewer personal business appointments. According to the assessment of the participants, tourist trips or trips and overnight stays motivated by friends and families may return to pre-crisis levels much faster—although a considerable proportion of the respondents also saw potential restrictions here.

Accordingly, respondents do not expect a rapid recovery for the segment as a whole across location types in the coming years. The best prospects are assumed for hotels in core cities and in rural areas, because this is where tourism trips are most likely to happen. Hotels in affluent suburbs or other interlinked areas, which are sometimes booked by particularly large trade fairs or by business travellers with a smaller travel budget, should expect the most arduous recovery paths (see Fig. 7).

[4] For values above 100, the index signals growth, for values below 100, it signals shrinkage.

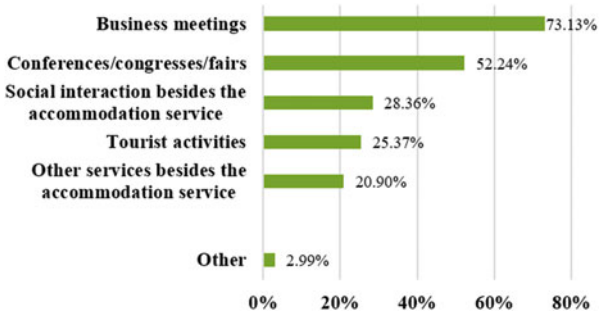

Fig. 6 Business activities at hotels are most likely replaceable. Notes: Own data collection on the question "Which aspects of hotel real estate can be replaced for its users after the pandemic?"; multiple choices possible; 6.94% of participants in the survey on the hotel asset class did not provide any information; most frequent mentions for other: everything necessary, new business models

The survey results also show that proximity to office or retail properties will become less important for the hotel location in the future, while access to health and social facilities as well as sports and leisure activities could gain.

Cost pressure is likely to increase following this consolidation—and possibly polarisation—phase. For investors, this restricted leeway could trigger a switch from fixed lease models to sales lease models; if necessary, lease models could also be changed into pure management contracts. And it could lead to the emergence of various forms of "lean luxury hotel business", the dismantling of services, so to speak. It is noteworthy that the inherent opportunity of the difficult market situation was very rarely discussed by respondents. This also suggests a slow and arduous recovery.

4 Final Remarks

Survey results evidence that real estate market players expect a significant increase in demand in the residential segment and that this—not least due to the scarcity in the metropolitan areas and the associated affordability problems—can be solved via external growth rather than pure densification. However, this external growth would not entail a "recapture of the rural area", but rather—as so often in the history of urbanisation—take the form of an expansion of core cities into the area.

This development requires project developers and investors to rethink—at least partially and temporarily—their approach, as the strategy for developing small or even micro-residential spaces in the highly dense spaces could appear less attractive. In particular, this possibly applies to those long-stay concepts that operate on the border between residential and hospitality accommodation, and whose demand fell in the wake of the pandemic due to a lower volume of long-term business travellers.

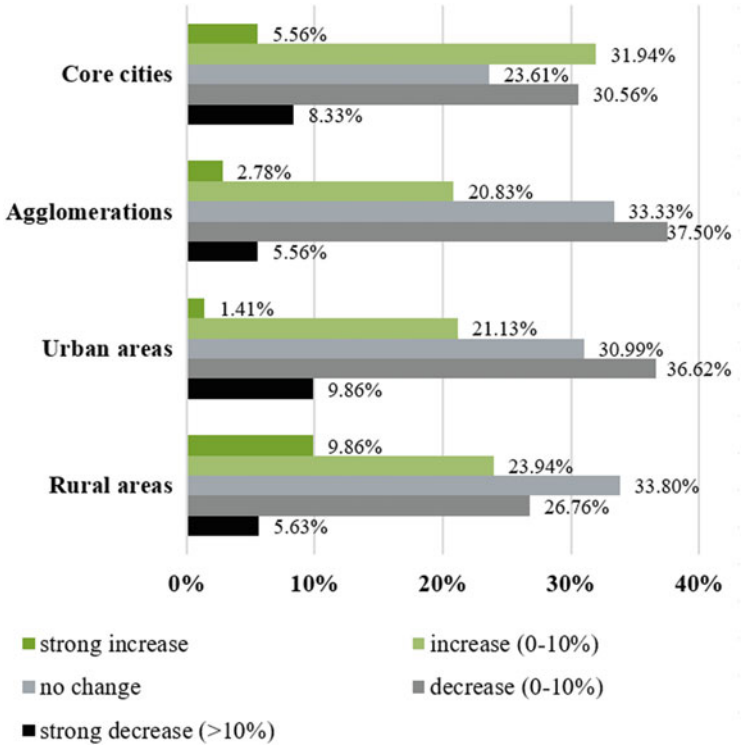

Fig. 7 Outlook for hotel space demand over 10 years. Notes: Own data collection on the question "Please estimate the demand for hotel space in the following regions for the next 10 years"; 0.00%/0.00%/1.39%/1.39% of the participants in the survey on the hotel asset class did not provide any information; definitions according to the BBSR: agglomerations—regional centre over 300,000 inhabitants, urban areas—regional centre over 100,000 inhabitants, rural areas—without regional centre over 100,000 inhabitants

The extent to which the troubled hotel industry can deliver part of the solution through reallocation depends first of all on the willingness of planning authorities to support such planning changes. If so, the greatest potential for conversion would not lie in core cities, but rather in the interwoven suburbs because the recovery process for hotels there could take longer than in centres (or in scenic regions whose offer is heavily geared towards leisure tourism). For this to happen, it would be essential that such conversions are not conducted in isolation, since residential spaces require a different integration into urban and social environments than hotels do. The survey made it clear that public spaces, social interaction and accessibility to social infrastructure (e.g. kindergartens or schools) remain crucial for the residential segment. Of course, stand-alone conversions can also help to reduce the shortage of residential space, but this should only be marketable for formats in the lower price segment. And here, too, the social infrastructure and the desire for public space should be considered.

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Tobias Just is a Managing Director at the IRE|BS Immobilienakademie and professor of Real Estate at the University of Regensburg. Tobias studied economics in Hamburg and Uppsala (Sweden). In 1997, he started to work at the University of the Federal Armed Forces Hamburg. His PhD dissertation was awarded the university science prize in 2001. For more than 10 years, Tobias worked at Deutsche Bank Research. He headed the unit's sector and real estate team and was a member of Deutsche Bank's group-wide Environmental Steering Committee. In 2006, Tobias was a Research Fellow at the American Institute of Contemporary German Studies at the Johns Hopkins University. Tobias published more than 200 papers in professional and academic journals and books. Until 2021 he was President of the German Society of Property Researchers and is the editor of the ZIÖ—the German Journal of Real Estate Research. In 2018, Tobias became a Fellow of the RICS by nomination.

Franziska Plößl is a Research Assistant and doctoral candidate at the International Real Estate Business School/University of Regensburg. Franziska studied Real Estate Business (MSc) at the University of Regensburg and International Real Estate (MSc) at Florida International University, graduating at the best of her class. She has published on various topics, including CREM, nursing homes, and megatrends, in the real estate industry.

Is the COVID-19 Pandemic Accelerating the Path to Smarter Cities?

Bart Gorynski, Thomas Müller, and Alexander Gelsin

Abstract

The impact of the COVID-19 pandemic has accelerated certain aspects of smart city development. Impressive leaps have been made in many sectors, from urban data platforms to urban mobility. However, to capitalise on that momentum, city governments need to ensure a strong focus on resilience and focus on citizen-centric goals that promote liveability, sustainability, and social equity. To better understand the future of smart cities, we begin by examining previous approaches that municipalities worldwide have deployed over the past few years. With the arrival of the pandemic, and with resilience taking centre stage, we take a look at how quickly cities have adapted to the situation, evolving to accommodate the needs of citizens and innovating to build back better. By utilising a plethora of tools in a smart city's toolbox, we explain how existing technologies and practices can better serve all stakeholders to help manage potential crises in the future, and making cities more resilient. We specifically highlight the importance of deep collaborations between citizens, the public sector, the private sector, and other smart cities for successful post-COVID-19 smart city transformation.

1 Smart City: Quo Vadis

The COVID-19 pandemic has posed several challenges to cities and municipalities worldwide. The situation has highlighted the importance of digitisation for the safe and continuous delivery of many municipal and private sector services. In 2021, the path out of the crisis—and with it, revitalising our cities, strengthening social cohesion, and reinvigorating the economy—will dominate most discussions.

B. Gorynski (✉) · T. Müller · A. Gelsin
bee smart city, Muelheim/Ruhr, Germany
e-mail: bart@beesmart.city; tom@beesmart.city; alex@beesmart.city

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"Building back better and stronger" is the current theme—and the smart city concept is a key to this.

1.1 The Evolution of Smart Cities: Four Smart City Generations

Over the past two decades, the smart city concept has fundamentally changed regarding the approaches that cities and communities employed to manage urban digital transformation. In his seminal article on the three generations of smart cities, urban strategist Boyd Cohen (2015) has outlined the evolution of smart cities.

Initially, the smart city movement was driven by large technology companies that used the term smart city as a sales argument, promising efficiency and innovation to local governments (Smart City 1.0). It did not take long until the public sector realised that technology was a powerful enabler for achieving governmental, economic, and societal goals. But it became clear that local governments needed to actively lead and manage development projects to prevent vendor lock-in and dependency on private sector businesses (Smart City 2.0). Today, smart city strategies view technology as an enabler only—and not as a means to an end. Cities and municipalities have understood that top-down approaches and the latest technology are not necessarily crucial to successfully tackling urban challenges and mitigating risks.

Instead, collaborative and participatory citizen- and user-centric approaches (Smart City 3.0) display the most important success factors. In some cases, such as the Dutch Amsterdam Smart City project (Amsterdam Smart City, 2021), cities and municipalities start to use a digital platform approach to expand their smart city solution and partner ecosystem collaboratively. From our perspective (bee smart city, 2019), there will now be an emergence of a fourth generation in the smart city evolution. From the standpoint of stakeholder engagement and the perspective of technology, we see the emergence of a "city-as-a-platform" approach. Urban data platforms and digital twins—based on Internet of Things (IoT) applications—enable local governments to better plan and manage urban infrastructure, optimise processes, and improve decision-making (Smart City 4.0). Figure 1 highlights these four generations of smart cities.

To master the transformation to smart cities, a local government should incorporate the needs and challenges of its stakeholders, consisting of citizens, businesses, workers/commuters, entrepreneurs, academics and non-profit organisations, and its public sector employees. In the wake of the pandemic, the needs and challenges have changed and expanded.

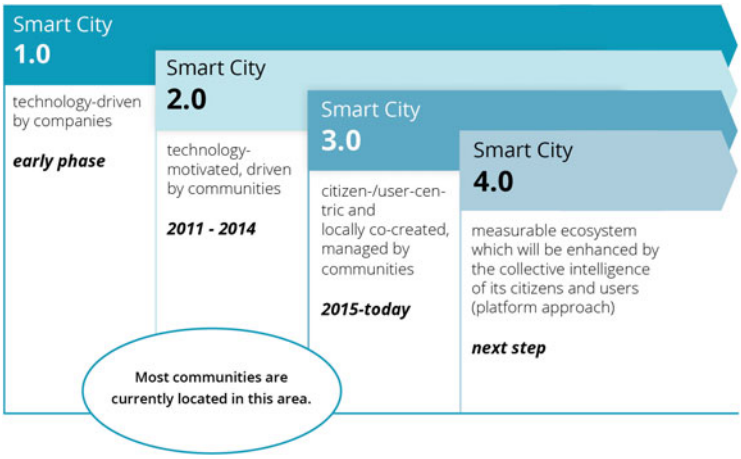

Fig. 1 The four evolutionary generations of smart cities. Source: Own illustration, bee smart city (2019)

1.2 Smart City Definition, Urban Development, and Fields of Action

The smart city concept is constantly evolving: The International Telecommunications Union (ITU) of the United Nations (2014) defines the term "Smart City" or "Smart and Sustainable City" as follows:

> A smart and sustainable city is an innovative city that uses information and communication technologies (ICTs) and other means to improve quality of life, the efficiency of operations—communal infrastructure and services, and competitiveness—while ensuring that it meets the economic, social, environmental and cultural needs of present and future generations.

In November 2020, an informal EU ministerial meeting on urban development adopted "The New Leipzig Charter" (Bundesministerium des Innern, für Bau und Heimat, 2020) as a framework for integrated urban development policy in Europe, which takes up the active design of digital urban transformation as a crucial factor for integrated urban development (see chapter "Urban Planning Aspects of the Resilient City"—Weidner, 2021).

While one aspect emphasises the development and implementation of integrated, inclusive, and common good-oriented smart city strategies, another aspect is that digital solutions—especially in times of crisis—can secure and strengthen the ability of municipalities to act. With digitalisation and the "Sustainable Development Goals" (SDGs) of the United Nations' "Urban Agenda 2030" (United Nations, 2015b) and principles of the "New Urban Agenda" (United Nations, 2016) being practically included in the "New Leipzig Charter", the framework clearly recognises

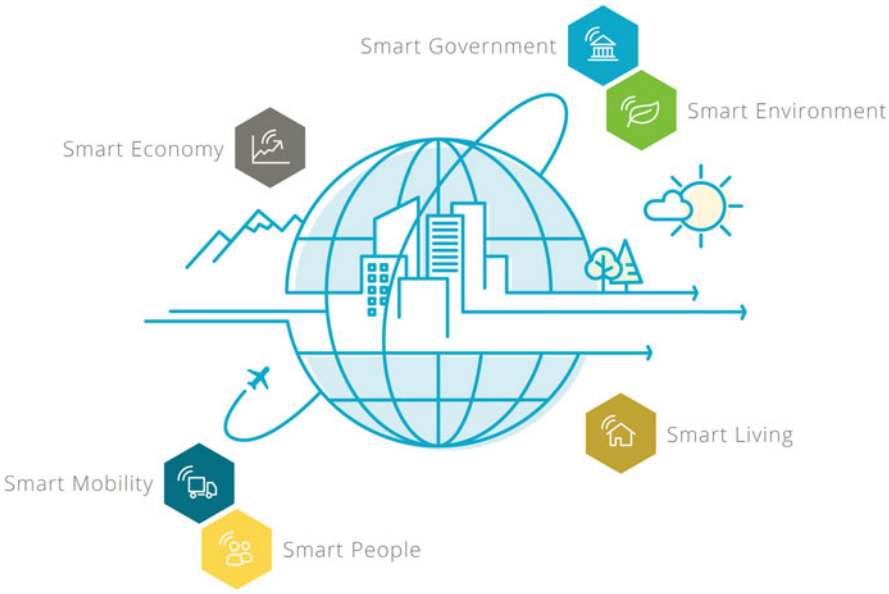

Fig. 2 The six fields of action of the smart city. Source: Own illustration, bee smart city (2019)

the importance of integrated urban development towards smart and sustainable cities and communities.

Digitalisation and sustainability are megatrends that influence all aspects of urban development. Therefore, a holistic perspective is required by local governments to identify the fields of action where smart city solutions and initiatives can contribute to seize development opportunities or to mitigate risks and increase resilience, with the goal of future-proofing the city in terms of livability and prosperity for all stakeholders.

A popular categorisation was developed by Giffinger and his European Smart Cities research group at the Centre of Regional Science of Vienna University of Technology, differentiating the smart city application areas at the city level into six fields of action (Giffinger et al., 2010): Smart Economy, Smart Environment, Smart Government, Smart Living, Smart Mobility, and Smart People (see Fig. 2).

A city implements solutions within these six fields of action and starts initiatives in sub-themes and application verticals to improve urban development. For example, during the pandemic, many cities implemented crowd management and access control solutions to help the local economy in city/district centres as well as the tourism sector within the smart economy field. Cities can easier manage and monitor the implementation of smart city strategies by categorising core fields of action, followed by specific sub-themes and verticals.

A holistic view additionally requires a spatially differentiated consideration of the smart city approach. Figure 3 shows the five spatial levels of action that are of

Fig. 3 The five spatial levels of action of the smart city concept. Source: Own illustration, bee smart city (2021)

importance to the successful implementation of a smart city strategy and to reach a city's overall development goals.

The pandemic constitutes a challenge for society, which needs to be addressed at all these spatial levels to prevent and/or better manage future pandemics. Each of these five levels requires and involves different stakeholders—therefore, the smart city concept represents a multi-stakeholder approach.

While national and state governments can set favourable regulations and conditions, including incentives, local action, and grassroots initiatives are required to truly achieve urban resilience and sustainability goals within a city or region. On the regional and local level, city and county governments oversee the development of smart city strategies and are responsible for reducing red tape, creating a culture of innovation, and involving all relevant stakeholders. City-wide initiatives and solutions are orchestrated by local government departments and subsidiaries, taking spatial disparities and inequalities into account. On the district and building levels, the real estate industry and utility companies are predominant in driving the implementation of solutions. At the same time, the city government provides planning support and encourages bottom-up initiatives of the civil society and citizens within districts.

The pandemic has led to the reconsideration of the spatial division of city functions. Proximity and accessibility are crucial elements of emerging planning

Fig. 4 The eight fields of action for Smart Districts and Neighbourhoods. Source: Own illustration, bee smart city (2021)

concepts to build back stronger. The 15-minute city—pioneered by the mayor of Paris, Anne Hildago, during her 2020 re-election campaign—is one of the most recognised concepts. Many other cities have adopted the concept during the pandemic crisis (Moreno et al., 2021). But this concept has also been criticised, as it requires changing complex planning approaches and organising the reallocation of space and resources (Pozoukidou & Chatziyiannaki, 2021). The concept of proximity and dense communities is not new; Jacobs has analysed the value of neighbourhoods and proximity in her book "The Death and Life of Great American Cities" (Jacobs, 1961). And yet, we should not neglect what we have witnessed during the pandemic: that the district or neighbourhood level is essential to increase resilience and liveability while solving central urban challenges (Yeung, 2021). Figure 4 shows the eight fields of action required to create smart districts and neighbourhoods.

At its core, the smart city concept can be operationalised to an ecosystem of technical solutions and non-technical initiatives/processes implemented on the respective spatial level and within the respective field of action and relevant sub-themes, as discussed earlier in this chapter.

For example, a smart kiosk/digital signage solution in a neighbourhood can encourage residents to conserve fossil resources (field of action no. 1) by displaying energy consumption data for the neighbourhood and/or showing savings opportunities for electricity and water gas, and waste. By displaying the current weather and suitable suggestions for activities in the community, the technical

solution can also increase leisure and recreation activities that lead to improved health or increase the duration of stay (field of action no. 6). Suggestions can also include activities organised by residents or civil society initiatives in the neighbourhood, strengthening the sense of community and social cohesion (field of action no. 3). The technical solution can also be commercialised by enabling neighbourhood management to advertise local offers for a fee in cooperation with local retailers, cultural institutions, gastronomy, or service providers (field of action no. 2). Through IoT-based applications, such as connectivity (e.g. free public WiFi hotspots) and emergency services (e.g. showing crowded streets, parks, or beaches in near real-time and advising visitors which parts of the city are safe to visit to adhere to distancing rules), the neighbourhood is also expanding digital infrastructure and service provision (field of action no. 8).

Startups, small and medium-sized enterprises, and corporations are continuously expanding the ecosystem of available smart city solutions, adapting their solutions to meet new end-user needs that change due to the pandemic and other challenges (e.g. climate crisis). While the cholera epidemic of the 1830s helped shape the Parisian sewer system (Kesztenbaum & Rosenthal, 2017) and the Spanish flu led to better ventilation standards for buildings (Hobday & Cason, 2009), the pandemic has the potential to accelerate the evolution of the smart city concept at all spatial levels and within all fields of action.

2 Preventing Pandemics: How Can Smart Cities Increase Resilience?

The current situation has shone a spotlight on the vulnerability of modern cities and highlighted how cities and municipalities have accelerated the spread of the virus. Fortunately, the pandemic has also accelerated the evolution of smart city principles and forced the fast adoption of many forward-thinking policies. Increasing resilience is a key feature of any smart city strategy, but rather than focusing on broader future-proofing verticals, such as climate change or resource security, pandemic resilience is better targeted at the city and neigbourhood levels, focussed on citizen-centric themes.

By placing the needs of residents at the heart of any smart city plan, cities can become more resilient. The rise of the 15-minute city (Appleton, 2020) or 20-minute neighbourhood as forward-thinking urban planning solutions can help to limit the damage caused by any future pandemic. Residents will no longer have to travel greater distances to meet their needs, and the adoption of hyper-local mentalities will help forge greater community links. The latter is particularly important when it comes to lockdown situations, allowing local governments to act faster and deploy safety measures in an efficient and sustainable way, saving lives and protecting businesses at the same time. However, the 15-minute city concept must be handled with care. Three main aspects should be considered: (1) Not all centrally located amenities (such as centres of learning and cultural hubs) can or should be decentralized. (2) Gentrification, which could force citizens out of the very areas

that were designed to improve their quality of living, needs to be prevented. (3) The concept needs to be applied to all districts for coherent urban planning. Properly applied, the 15-minute city can be an urban planning success story.

Similarly, the adoption of a local mindset has been reinforced by the rise of cycling, walking, and micro-mobility platforms as viable transport options in our cities (Dekki, 2020). The pandemic has accelerated a trend towards slow streets, green spaces, and reduced access for internal combustion engine vehicles. Not only do these measures improve the liveability of a city, but they are an essential part of policy and planning priorities such as the Paris Agreement (United Nations, 2015a) and for achieving the Sustainable Development Goals. Impressive examples include Paris' plans to pedestrianise the Champs-Élysées (Guy, 2021) and how the City of Athens has re-allocated up to 50,000 m^2 of land exclusively for cycling and walking (Connolly, 2020).

The needs of citizens reach beyond urban planning. As cities embrace the digital transformation, more government services are accessible online. Providing a wide range of government services to citizens and other stakeholders using digital portals, irrespective of time, location, and staff availability, allows the government's wheels to turn even during trying circumstances. The digital transformation of government services is just one of many ways that modern technology can be leveraged to strengthen urban resilience. With the advent of smart technology and the deployment of city-wide IoT networks (Appleton, 2021), local governments and citizens now have access to sophisticated data tools that can help shape policy and influence decision-making.

Examples of urban data that was used to tackle the pandemic include the use of AI to predict where and when areas of the city are likely to become crowded, sophisticated track and trace applications that monitor and analyse the spread of infections, and citizen participation platforms (Roch, 2020) that are being leveraged to democratise the utilisation of urban space and participatory budget spending. Though many of these tools have been implemented to tackle the pandemic, they are also important for accelerating the development of smart city principles (Chagoury, 2020). By managing the pandemic at a local level, starting from smart neighbourhoods, smart cities and smart states will follow suit, controlling the spread of the pandemic and keeping citizens safe, economies stable, and governments running in order to benefit all stakeholders.

These are just some examples of the solutions that Smart Cities have developed to improve resilience with regard to future pandemics. However, there are more valuable assets in the smart city toolbox that could be deployed in the future in order to better manage crises that can also be used to transform cities into more sustainable and liveable environments. To quote directly from the New Leipzig Charter (Bundesministerium des Innern, für Bau und Heimat, 2020):

> Cities and urban systems need flexibility as well as the ability to respond to external disruptive events and chronic stress. The robustness of cities to cope with changing framework conditions should be supported by an ability to learn from past events and

from each other, flexible urban governance for the common good as well as the balanced implementation of just, green and productive cities.

The ability to learn from past events is crucial to building better resilience and managing the cities of the future (see chapter "The Future Viability of City Networks"—Spars, 2021).

3 To Better Manage Pandemics: The Toolbox of a Smart City

Urban management is a broad umbrella term, but in the context of pandemic management, the recent situation has highlighted areas that can be improved significantly. While there is much to be done on national levels, cities and rural regions can make better use of existing strategies or adopt new ones to help tackle the issue, creating more resilient environments in the event of future pandemics.

Healthcare is a key pillar to future-proofing modern smart cities. The current situation has seen medical services overstretched and the quality of care was significantly reduced as medical professionals struggled to administer care to overwhelming patient numbers. Several solutions can be adopted at a municipal level to help take the strain off local healthcare services.

Barcelona is a prime example of a city that has embraced the digitalisation of healthcare. The city's pioneering Telecare Service (Generalitat de Catalunya, 2020) was introduced in 2013, but the number of active users of the system has skyrocketed during the pandemic. It is a telemedicine service that protects vulnerable citizens, allowing them to call ambulances, communicate with medical staff, and take preventative actions without having to leave their homes. Although this Barcelona city council initiative (Barcelona Provincial Council, 2013) targets elderly and vulnerable citizens, it is actively helping to ease the pressure on general practitioners and hospitals, making healthcare more accessible for everyone.

Similar projects have been appearing in other locations. While they are not all government initiatives, the current situation has shown a greater need for private enterprises to help support medical services and a greater willingness for lawmakers to offer flexibility. For example, during the pandemic, the German government enacted a law change that allowed the use of private telemedicine services for customers of the nation's public health insurance scheme for the first time. This law change enables publicly insured individuals to use private telemedicine services, cut doctor waiting times, and allow easier access to prescription medications for those who need them most. Allowing patients to contact doctors and health services remotely also helps to tackle one of the city's biggest pandemic challenges: mobility. Urban mobility has suffered greatly at the hands of COVID-19 and it is no secret that mass-transit systems have seen a reduction in their user numbers (see chapter "How COVID-19 Is Changing Mobility Behaviour and What that Means for Sustainable Urban Transport"—Jarass et al., 2021). Despite this, public transport is a crucial lifeline for many urban residents and an essential pillar of any local economy (Green Alliance, 2020).

To help keep cities moving, mobility providers need to adapt to changing situations quickly. One way to help make public transportation more appealing during a pandemic is to tap local data systems for real-time information on passenger numbers as well as peak times and scan for historical trends and make decisions based on these data sets. For example, at peak times when trains or buses are crowded, mobility companies should be able to deploy additional services to prevent overcrowding, making journeys more comfortable for passengers, with adequate social distancing measures in place.

While public transport has struggled over the past year, other mobility services have gained enormous traction. Cycling has become a popular transport method, with many cities reacting positively to the trend and implementing new bicycle lanes and providing safe and secure bicycle parking. Other micro-mobility solutions such as widely available e-bikes and bike-sharing platforms, as well as the addition of e-scooters have become viable alternatives to private car usage. However, to make the most of these solutions, cities will have to provide adequate parking, safe lane designation, provide better transport connections, and measure the sustainability of these solutions to ensure that the cities of the future can keep moving during a pandemic or similar crisis.

Keeping the economy moving is just as important as keeping people moving. There are two significant concerns for businesses: maintaining a reliable workforce and providing goods and services in exchange for money.

Flexible working, in the form of remote working and flexible working hours, can help address work/life balance inequalities. The recent adoption of flexible working during the pandemic has helped nurture a better work/life balance for employees, who can enjoy more family-friendly environments, reduced commuting times, and greater trust from their employers. These principles can improve the quality of life for many urban residents, even in a post-pandemic situation (see chapter "The Future Workplace: Reimagining the Office for the Twety-First Century"—Kane, 2021). However, this can only be done if they are supported by local labour regulations. For other sectors, maintaining safe and sanitary working conditions and giving employees access to regular health checks is essential to keep businesses running.

The exchange of money is a broader topic with many concerns. However, the quick adoption and transition to cashless payments and services are one of the simplest but most effective ways for cities and local areas to help prevent the spread of infectious diseases.

Clear instructions, concise guidelines, and strict compliance enforcement can help keep businesses afloat and economies strong. However, there is one industry that many cities rely on: tourism—which will need particularly help to become more resilient in the future.

Urban tourism is an industry that will take time to recover and will require smart innovation to help reinvent itself (Glasco, 2020). While many solutions are being put into practice today, we need to look into the future to see how smart tourism, and smart cities, can continue to operate during troubled times.

Closer collaboration between private and public sector agencies and other cities can help boost innovation and create stronger, more unique, and attractive tourism

services for consumers. Urban authorities must assist private companies to help find solutions to the biggest problems facing the industry (United Nations World Tourism Organization, 2020), whether that involves new concepts of hygiene, exciting new attractions, or providing digital coverage and augmentation for events.

The fast-tracking of new health safety concepts, from contactless ticketing and contact tracing apps to interactive signage and UV sanitation devices, must be a priority for tourism numbers to recover.

No matter whether the proposed solutions are digitally focused or rely on traditional methods, building trust between travellers and local governments and businesses should be the cornerstone of any smart tourism strategy. In a time of great uncertainty, mired by misinformation and a lack of situational clarity, trust and clear communication is essential to the tourism industry's recovery.

All of the above-mentioned solutions available in a Smart City's resilience toolkit can be underscored by the practical use and application of data. As each city and industry faces its unique problems, there are no one-size-fits-all solutions. However, by capitalising on gathered data, analysing trends, and pinpointing trouble spots, a modern smart city can successfully manage a pandemic, adapt to new situations, and provide flexibility to protect citizens, save lives, and keep industries afloat.

4 Collaboration to Accelerate Smart City Innovation

Important steps have been taken towards accelerating the smart city agenda and transforming cities into liveable, equitable, and healthy places, but more needs to be done.

One of these to-dos is a better focus on collaboration: Collaboration between a wide range of stakeholders and organisations is essential to make progress to smart cities. Partnerships between public and private sector organisations can help enable a higher level of innovation and allow cities to deploy solutions faster and more efficiently. Studies have shown that 50% of city leaders have agreed that finding the right partners to collaborate with has been one of the biggest hurdles in the way of cities reaching their goals. Close collaboration is important, but it must be done transparently and securely (Thambiran, 2020), putting the needs and rights of citizens in the foreground, especially with the rising dependency on data.

Sharing data and ideas is at the heart of any smart city development, but while governments should seek out private sector partnerships, they should also foster better collaboration between internal city departments and how they can interact best with private enterprises. Urban planning departments can greatly influence the shape and direction of our future cities (Kunzmann, 2020) and they should not be excluded from the smart city agenda. Instead, they should be innovating new ways to enhance our cities, working closely with the real estate sector to develop more sustainable public spaces, creating smart buildings, and nurturing smart districts. It is easy to focus on the digital aspect of smart city development, but that can only succeed without neglecting the physical elements of city planning.

The smart city journey is not a cheap one, and without emphasising the benefits of technological innovation and highlighting the importance of making cities more liveable and sustainable for all stakeholders, important funding could be cut. During the crisis, budgets have already been cut, and city budgets have not been spared. Budgets are likely to be re-evaluated (Thambiran, 2020), given that a smart city can both help to mitigate future crises and adapt to changing needs and desires of city populations.

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Bart Gorynski is co-founder and managing partner of bee smart city which was selected by the global smart city initiative of the United Nations (U4SSC) as its global Smart Sustainable City partner network ecosystem in 2019. He is the author of various publications on Smart City and Smart Region topics. Bart has been appointed as an expert in the Smart City Initiative Stadt.Land.Digital of the Federal Ministry of Economics and Energy and holds a number of visiting academic positions on smart city and smart district. Bart has over 10 years of experience in the real estate sector, in open and collaborative innovation strategies, and in corporate strategy and smart city and district consulting. Bart holds an MBA, is a Certified Investment Analyst and Certified Risk

Manager. Just prior to co-founding bee smart city, Bart served as a senior manager for Europe's largest residential real estate company, Vonovia.

Thomas Müller is co-founder and managing partner of bee smart city, the leading global smart city network and community. At bee smart city Thomas is Chief Marketing Officer and Head of Public Sector Consulting. With 15 years of work experience in the public sector, Thomas is an expert in Smart City strategy development and implementation. Thomas is the guest author of the book "Smart Cities, Smart Future: Showcasing Tomorrow" and regularly speaks at international smart city events and conferences. He also is a guest lecturer at IRE|BS International Real Estate Business School on smart city and smart district topics. Thomas holds an MA in Economic Geography from Technical University Aachen (RWTH Aachen) and an MBA in International Strategy and Sales Management from the University of Applied Sciences in Economics and Management Essen (FOM Essen).

Alexander Gelsin is co-founder and managing partner of bee smart city. At bee smart city he oversees research and product development. After his PhD in Astrophysics at the University of Heidelberg, he was responsible for complex consulting mandates of leading banking and payment technology companies with a focus on Big Data analyses, simulations, and product development. Alexander has been analyzing and evaluating the smart city market since joining the European Commission in Brussels in 2015. As deputy head of Public Sector Consulting, he also brings his expertise into the municipal strategy processes, by designing and facilitating workshops and events, by implementing online participation processes, and designing smart city monitoring and evaluation frameworks based on global standards. Alexander acts as a jury member in several engagements (e.g., for the Intelligent Community Forum (ICF) based in New York City) and is a speaker at various technology and smart city conferences. He also teaches at the ITU Academy on the topic of Smart and Sustainable Cities.

The Urban Neighbourhood of the Future Is Just One Step Away

Sabine Georgi

Abstract

In this interview, Henrik Thomsen, Chief Development Officer of Deutsche Wohnen SE (Germany), describes the development of modern, future-proof and sustainable urban neighbourhoods and what is required on the way there, based on experiences from the COVID-19 pandemic.

1. *What experiences and insights from the COVID-19 pandemic have you carried with you into your everyday professional life? Are there things that you view differently today in your role as a board member?*

Mr. Thomsen I would rather describe it like this: our priorities have changed. Over the past 14 months, we have all spent more time than ever at home, not just our free time, but also our work time. The home as a living space has gained considerably in importance. For the board of directors of a housing company, these experiences are important in setting the development of future-oriented neighbourhoods on the right course. The issue of health of both our tenants and our employees has increased in importance.

2. *Is it a new insight that our own homes are important?*

Mr. Thomsen Of course, our own homes were important also before the pandemic. Home is our place of retreat. But the pandemic has increased demands on our homes, and has added new ones. The office desk at home is just a few steps away, often it is in the middle of the living room. Travelling and going out have been restricted. So our work and a lot of our leisure time was spent within our own four walls or in the fairly immediate environment. It has become more important whether there is a balcony or a garden.

S. Georgi (✉)
The Urban Land Institute Germany/Austria/Switzerland, Frankfurt am Main, Germany

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3. *You just said that demands on properties have changed. Does this also apply to the real estate industry?*

Mr. Thomsen I will answer this question like this: Real estate shapes the places that people live in. It provides security and protection and creates neighbourhoods. It provides spaces for living, working and leisure activities as well as art and culture. Real estate accompanies our lives most of the time. The real estate industry is therefore an industry with a high-level presence in our lives, and it therefore bears considerable responsibility. It is right that we claim this responsibility, and it is important that we face it. At Deutsche Wohnen, we have been aware of our responsibility towards our tenants and stakeholders for many years and have documented it, for example in what we call our tenant promise. Among other things, we guarantee that no tenant will lose his or her home due to a rent increase. Our voluntary commitment, unique in the industry, specifies that we will not increase rents if the annual net rent were to exceed 30% of the annual net household income.

4. *Let's take working from home as an example. How can the real estate industry respond to the fact that people are working from home more often? In your view, do condominiums have to be designed bigger now because households will need an additional room to work in?*

Mr. Thomsen More floor space per unit is not a sustainable approach to the idea of bringing living and working "closer" to each other. On the one hand, intelligent, flexible and technically well-equipped, compact floor plan solutions can contribute to this. This means that we need to avoid oversized development areas and keep less-used rooms, such as a guest toilet, as small as possible. Instead, we should be creating multifunctional spaces where people can live and work. On the other hand, co-working spaces in residential neighbourhoods can also meet this requirement. I can go to work for a few hours without a long commute, pick up the children at the nearby day-care centre and go grocery shopping. The residential environment and its quality of stay also play an important role.

I see these concepts as being in line with the Leipzig Charter for Urban Development, which describes a city of short distances. It is precisely this issue that politicians have tried to take into account by the introduction of the new "Urbanes Gebiet" (Urban Area) category in the German Building Code. We intend to implement this in our future neighbourhoods, for example in our project in Daumstraße in Berlin-Spandau.

5. *But probably not everyone feels comfortable in a hip start-up co-working space where people are drinking bottles of "Club Mate" from the fridge?*

Mr. Thomsen I can relate to that very well. Co-working spaces certainly have their roots in the start-up scene, but the concept also suits many companies beyond this scene. And it also works without "Club Mate". Since April, we have provided 16 co-working spaces on 300 m^2 in a vacant bank building in the north of Berlin. These are really nice and completely "regular" workspaces. This concept aims to organise the neighbourhood in such a way that residents do not have to commute

long distances but can have their office right on their doorstep. This saves time and also helps to achieve climate objectives.

6. *What defines the neighbourhood of the future from a design point of view?*

Mr. Thomsen In general, we have to think of neighbourhoods as a whole. This means that we cannot only focus on housing but must consider all aspects of life in the neighbourhood. For example, we have to take demographic trends into account. In our project in Dresden Schützengarten, we are therefore planning around 80 barrier-free units including some that are wheelchair accessible, for assisted living. At the same time, there is always the question of what and how we build. For the aforementioned project in Daumstraße in Berlin, we have focused, among other things, on short distances. The neighbourhood includes sustainable construction, i.e. wood hybrid construction, open structures with short distances, for instance to local suppliers and to co-working spaces, as well as innovative mobility concepts. We have taken e-mobility into account right from the start and want to create our own mobility hub. But we also have to think more integrally as planners. We work in interdisciplinary teams right from the beginning and use digitalised planning tools such as Building Information Modeling (BIM). This is a planning tool which comprises all steps of a construction project within a digital model. We create an extended 3D model of what the neighbourhood will look like. For example, we can calculate shading offered by trees at different heights of the sun; we can adjust the sizes of individual balconies and divide up the land in such a way as to create an optimal ratio of usable space to gross floor area. But BIM also allows us to add other dimensions to the model. We can estimate construction times and costs much more effectively with each change and better coordinate the different construction phases in order to keep construction costs under control. The result is affordable housing with high standards of comfort. What is even more important: BIM is the key to success for sustainable real estate management. The stored planning data supports the maintenance of properties and neighbourhoods. It also makes it easier to plan refurbishments.

7. *Why is BIM not used more often?*

Mr. Thomsen In some parts of the industry, digitalisation is simply lagging behind. There are many who say: We've always done it this way, which means that the way houses are built has not changed significantly. You place brick on brick, and then you install cables by cutting holes in the brickwork, putting in the cabling and closing the holes. Not very efficient. We at Deutsche Wohnen also want to incorporate the projects into our portfolio and therefore already have a view of how our tenants will live there one day when the 3D model is created. Modular, serially-produced construction has injected a little more drive and innovation into the building process, which has been accelerated by BIM. A few years ago, for the many large construction sites such as BER airport, the Elbe Philharmonic Hall in Hamburg or Stuttgart 21 railway station, there was a major projects commission in the Ministry of Construction and Transport. This commission decreed that all large very high-volume projects had to use BIM. We asked ourselves why BIM should

only be used in large projects when all its advantages can also be exploited in traditional neighbourhoods, enabling us to create much more liveable urban districts.

8. *When you talk about liveable urban neighbourhoods, you certainly have the ideal neighbourhood in mind. What do you envision when you start designing the urban neighbourhood of the future?*

Mr. Thomsen First of all, I keep in mind the people who will live in this neighbourhood one day. We intend to create future-oriented, liveable and neighbourhood-friendly residential areas—based on the needs of the people who live in them. Intergenerational living is an important part of our strategy. In the design process, we ensure that we integrate society in all its diversity. For example, Deutsche Wohnen has committed itself to renting out every fourth unit to tenants with a housing entitlement certificate, i.e. households with lower incomes. In addition, the ideal neighbourhood must be energy-efficient and sustainable. The Paris Climate Agreement is firmly anchored in the company's strategy and the implementation of climate objectives are part of our strategy for new construction. Decentralised energy supply, innovative mobility concepts and sustainable materials such as wood as a renewable raw and construction material—these are all elements of our concepts. Incidentally, we highlight this sustainable approach through our membership of the German Sustainable Building Council (DGNB) and our efforts in new construction to achieve at least the gold standard. We could imagine becoming involved in the production of wooden construction elements as well, in order to be able to plan and build more efficiently.

9. *Where does your passion for working with wood come from?*

Mr. Thomsen The passion is based on hard facts: Wood captures CO_2, it is regenerative, provides a good indoor climate and is useful in many ways—especially in serial production, through which we can reduce construction costs. Yes, there are exciting projects that rely heavily on the use of wood. Think of the former Berlin Tegel Airport. In the Schumacher district in Tegel, Berlin Projekt GmbH is planning a climate-neutral neighbourhood and is focusing increasingly on alternatives to concrete, such as wood. If you add plant cover to façades, ideally ivy, because it is able to absorb fine dust particles, then you create a pleasant urban climate—in other words, the best urban climate adaptation strategy you can think of.

10. *This means that the urban neighbourhood of the future is already taking climate change into account and adapting to future weather and extreme events?*

Mr. Thomsen We have already mentioned the responsibility of the real estate industry. Two statistics illustrate this: the building sector accounts for around 30% of CO_2 emissions and 75% of the world's CO_2 emissions are produced in cities. This means that climate change is being determined in urban areas—nowhere else. We must do all we can to use our resources responsibly, to ensure that cities emit less and less CO_2 and to organise our lifestyles in a more sustainable way. Accordingly, we plan, build and manage in a sustainable manner and, in particular, use sustainable building materials in new construction. We implement regenerative energy

production on site. The energy transition is moving into the neighbourhood—from electricity generation to heat supply. We strongly support tenant electricity legislation that provides certainty for planning and investment. We focus on refurbishing our buildings. Compared to the rest of the sector, Deutsche Wohnen's housing stock is rather above average, for example in terms of the quality of its construction and its energy performance. But the following applies to Germany as a whole: around 64% of the entire building stock in Germany was built before 1979 and therefore before the first regulation on heat insulation. This was the first time in Germany that rudimentary regulations were set for the energy efficiency of buildings. Around 94% of the total building stock was built before there was an Energy Saving Regulation. So, there is a lot to do.

11. *That seems expensive and time consuming. Is there any potential for conflict with your tenants, who have to pay for it one way or another?*

Mr. Thomsen You raise a very important point: social compatibility. Whether we are building new urban neighbourhoods or refurbishing our existing buildings, we have to consider the tenants in all aspects. And we have to deal with the financial limits of climate protection measures. It would not be advisable to play climate protection off against housing costs. At Deutsche Wohnen, we have dealt intensively with this issue in the past and, as a result, we have promised our tenants that no tenant will lose their home due to energy-saving modernisation. But we have to realise that we cannot achieve the Paris climate objectives on our own. Climate protection concerns everyone. It needs a triad of government, private business and civil society in which everyone contributes.

12. *You want the state to cover the costs of climate protection?*

Mr. Thomsen That would be too easy. There are already many programmes available. Looking at all KfW (German Reconstruction Credit Institute) programmes, our impression is not that we lack a variety of support—it is rather the amount and targeting that represent the problem. An average annual refurbishment rate for existing buildings of 2.5% over the next 30 years is an essential element on the way to climate-neutral building stock; the current refurbishment rate in Germany is around 1%. Increasing this rate requires a total investment volume of almost 500 billion euros, which must be paid for without overburdening tenants. We have something else in mind. At Deutsche Wohnen, we have presented a proposal for socially acceptable climate protection: the funds from the new CO_2 price should be used to relieve tenants of some of the costs, i.e. the modernisation charge. In the first year, the state would pay the full modernisation charge. Over the following 14 years, the support then continuously decreases and the residents gradually pay the climate protection costs.

13. *This means that the landlord would still have his investment costs refinanced through the modernisation payment, but the tenant would not have to pay more, because the typical rent increases would not occur but would be taken over by the State?*

Mr. Thomsen Absolutely right. It's a cycle. After all, the funds from the CO_2 charge are also paid by the tenants by means of their heating bills. Therefore, it is only right and reasonable if they are also reimbursed for the costs of modernisation. We have calculated this once. Because the tenants are immediately reimbursed for the utility costs in the first year after modernisation is complete, but the basic rent does not increase, they benefit from a reduced gross rent over a period of 9–13 years, depending on the type of building. The tenants therefore actually pay less rent over many years—despite modernisation.

14. *This way, you turn old neighbourhoods into the urban neighbourhoods of the future, so to speak?*

Mr. Thomsen We will at least have to take this direction much faster if we want to achieve climate neutrality across the entire building sector by 2050. Today's investment decisions take time. We therefore need more speed. We want to set a good example here and have set ourselves an ambitious goal: By 2040, our stock should be climate neutral. And we also believe we need more competition between urban neighbourhoods. People will experience how much more liveable a Kurt Schumacher district or the new construction project in Berlin's Daumstraße is compared to other city districts. Urban development programmes should support this. Of course, KfW programme 432—Energetic Urban Redevelopment—is already available here. The programme supports homeowners with energy advice. We think such programmes are important and they should be continued. But that is not what I mean when I refer to entire neighbourhoods. We have to make sure that we realise more smart city projects, where the bin is only collected when it is full, so that transport by truck is worth it and that, for example, only as much water is used in the neighbourhood as it has collected itself. All these concepts already exist. I would like to see an urban development programme targeted towards and supporting such concepts.

Sabine Georgi is an Executive Director at the Urban Land Institute for the DACH region (Germany, Austria, Switzerland). The graduate in business administration (BA specialisation in real estate) and Certified Real Estate Investment Analyst has now been working in the real estate industry for 25 years. She worked as a Country Manager at RICS; at ZIA Zentraler Immobilien Ausschuss as a department head for real estate and financial markets and as a consultant. Before that, she advised companies in the housing and real estate industry at the BBT Group consultancy and headed the marketing department. Sabine started her professional career at the Association of Berlin-Brandenburg Housing Companies (BBU) as a consultant to the board. During her studies, she worked for various companies in the real estate industry.

The Challenge for Developers to Build Attractive Places

Sabine Georgi

Abstract

In this interview, Guido Wiese and Tom Soreq, Managing Directors of ABG Development (Germany), discuss the development of urban areas with social quality of stay and the impact of the COVID-19 pandemic on the design and realisation of various types of real estate.

1. *What challenges and opportunities have developers been facing since the outbreak of the COVID-19 pandemic and do you think these are temporary or continuing?*

Mr. Soreq The pandemic has suddenly shifted the work environment "a decade into the future". Discussion had been ongoing in the political and private sectors in varying degrees of intensity over recent years, about working from home, location-independent working, free choice of working hours and the reduction of travel as well as digitalisation. The pandemic has revived this discussion, with employees having to decide workplace and time and coordinate professional and private tasks. The better the support offered by the living and working environment, the better the motivation and engagement. It is a major task to adapt future working and living spaces to the new requirements. The opportunity has arrived faster than expected to realise previous visions of the future in development and construction. We are asked to create sustainable neighbourhoods for the residents as well as for the community. The neighbourhoods are expected to offer attractive, urban and social quality of stay and spacious and flexible areas at the same time. People are demanding more open space and healthy living conditions for a better work-life balance. This is further accelerated by the pandemic experience.

S. Georgi (✉)
The Urban Land Institute Germany/Austria/Switzerland, Frankfurt am Main, Germany

T. Just, F. Plößl (eds.), *European Cities After COVID-19*, Future of Business and Finance, https://doi.org/10.1007/978-3-030-89788-8_14

Fig. 1 Deutschlandhaus in Hamburg. Source: ABG Real Estate Group

2. *The ABG Real Estate Group develops projects across all types of use. Have you had to reallocate strategically since the outbreak of the pandemic?*

Mr. Wiese Among our projects, the hotel, retail and restaurants and office asset classes were affected most heavily by the pandemic last year. Of course, we are not pushing any investments in hotels, which simply cannot be financed at the moment. We are also concerned that this sector, especially hotels focusing on exhibitions and conferences, may take years to recover from the pandemic.

At present, we are focused on residential and office properties. This year has led to awareness among employees in office businesses that retention, as well as interaction with colleagues, cannot be satisfied solely by working from home. In current meetings with potential office tenants, which have increased again in recent months, we are noticing a greater willingness to relocate. The focus is on central, easily accessible locations and flexible, modern office environments. We can meet this demand to a large degree with our CORE projects Deutschlandhaus in Hamburg (see Fig. 1) and VoltAir in Berlin-Mitte (see Fig. 2).

Still, tenants are reconsidering their overall space requirements and, after the euphoria of the last decade, have now entered a consolidation phase. We do not consider this critical but view it as an adjustment of supply and demand. It is inevitable that in 2023 and 2024, fewer new projects will enter the market, and this will have a positive effect on vacancy rates. In Germany, before the pandemic, there was a strong culture of presence in offices. This will also change. It will be interesting to see to what extent the "third workplace" will be accepted. While in Germany, only about 7% of employees want to take advantage of this new option, the rate in the USA is 38% (Pfnür et al., 2021). This is an opportunity for new

Fig. 2 Visualisation of VoltAir in Berlin. Source: ABG Real Estate Group

concepts at new locations, e.g. also in peripheral areas. Nevertheless, ABG continues to focus on core locations because the physical workplace has never been as important as today, a key finding of the last few months.

Mr. Soreq One of the main challenges is the development of attractive places to stay that allow us to do activities together even with social distancing. We need to replace traditional meeting areas to create places to stay and work, places where employees can be more generously seated and which open up to the outside in gardens, on terraces or in parks. Previously unused roof spaces, off-peak restaurant areas and public parks could be suitable for this purpose. "Home office" and "out-office" workplaces should be offered according to demand and integrated into the "work-life space". Restaurants, cultural facilities, parks or even external offices could offer "out-office" workplaces, e.g. via membership cards.

The growth in online shopping will reduce demand for shopping streets and malls in their current product diversity. But zones close to the ground floor will remain open to the public in the future. Contrary to the formerly widespread office-only city, citizens expect a place that offers a lively and attractive quality of stay even after business hours. Due to the pandemic-related partial closure of retail chains, we are

now developing real estate complexes that are suitable for an attractive mix of culture, shopping, services and culinary offerings. The increasing demands on the quality of stay are transforming the modern real estate from a plain workspace and provider into a "Pleasant Location", which allows for a wide range of attractive uses.

3. *What changes will take place by developing neighbourhoods?*

Mr. Soreq We are designing mixed-use neighbourhoods with decentrally organised and demand-oriented office space that can be managed by co-working providers. This reduces commuting and increases employee flexibility. In the context of increased ecological requirements, this will lead to a change in mobility concepts (car sharing, private transport, bicycles, etc.). More delivery services will support local supply.

Above all, however, outdoor space becomes more important as a place of retreat, a meeting place or as a place to work. Meeting rooms in pavilions, pergolas, under textile roofs or in winter gardens with all-weather access can increase the attractiveness of neighbourhoods as places of communication. While children's playgrounds and green spaces have been the main leisure facilities, outdoor workplaces under weather-protected lightweight structures can also be created in the future. The provision of open spaces with hardware and WiFi becomes feasible if the user accepts the necessary personal data collection for the equipment's protection. The establishment of public neighbourhood meeting areas, for example in parks, pavilions or similar, supports intergenerational communication and social contacts in the neighbourhood.

4. *Has the pandemic already had any effects on the floor planning of residential properties?*

Mr. Soreq Dwellings do not necessarily become larger due to the integration of a home office but are designed in a more flexible manner. In future, we will include rooms of approx. 5 to 10 m^2 for home office use or for flexible functions (guest room, etc.). We take into consideration acoustically effective sound absorption in the higher decibel range and, wherever possible, an attractive view as well as ergonomic furniture (see Fig. 3).

5. *How does this compare to office space? Have tenants already changed their demand? How do you implement this in ongoing projects? Are new building standards being established?*

Mr. Wiese From our point of view, the adjustments will be moderate. Even before the pandemic, we were building properties with air exchange rates significantly higher than the legal requirements. Of course, we are always open to technical innovations, but a facility must first and foremost be user-friendly. We also set clear priorities for sustainability and connectivity in our projects.

Fig. 3 Neighbourhood Living Isar in Munich. Source: ABG Real Estate Group

Mr. Soreq Nevertheless, building automation, which has so far still been cost-intensive, will replace systems with contactless identification systems for hygiene reasons, e.g. for the use of traffic routes, lighting, air-conditioning and in the sanitary area. In the future, air-conditioning systems will be installed with air filters and purifiers, and data loggers will be used to measure indoor air quality, CO_2 concentration, temperature and humidity. Furthermore, hygiene, cleanliness and disinfection will become an integral part of the standard features. Offices will be provided with adjustable dividing walls, individually movable and changeable walls, room-dividing furniture or even plant walls.

What is more, we do not expect less demand for office space than today. Even if a reduction in office workstations is to be expected, more office space will be required per workstation. Demand could increase from previously dense open-space areas with roughly 8 to 10 m^2 per workstation to twice this value. This is possible in a cost-neutral way by the use of alternating home/office workplaces with desk sharing.

6. *Hotels were very heavily affected by the pandemic. How do you deal with this shift in current projects and in future project planning? How can hotel projects be implemented with less risk for a developer today?*

Mr. Soreq It remains to be seen whether hotels will actually become less frequent in the long run. Concepts that shift hotel projects from "single-use" to "multi-use" could be of interest. Another possibility would be to outsource service facilities to professional operators. These could be extended offers in addition to the hotel

function: These functions include, for example co-working spaces, conference rooms of flexible size, possibly furnished permanent rental units with extended services, and opening up the hotel's own fitness studios, wellness areas and restaurants to the public. Collaborations between hotels and offices or businesses in the neighbourhood might also be considered.

7. *With regard to cities, has anything changed in the last few months in terms of cooperation between municipalities/partners in the public sector? Have requirements increased, and has planning become more difficult? Have processes been accelerated or slowed down?*

Mr. Wiese We have had mixed experiences. For example, in Berlin we were able to implement a development plan even though the district office was closed due to the pandemic. For this purpose, we quite pragmatically placed a construction container on the project site. This solution then served as a model for other districts.

However, there have also been cases with delayed processes, e.g. because the IT equipment of public authority employees in their home offices was limited. The pandemic has therefore reduced the efficiency of approval-relevant processes and consultations with public authorities as well as with other partners. In some cases, considerable approval hold-ups and delayed realisation were to be expected. It would be desirable if, despite these measures, the involvement of the authorities could be more efficient and digitalised. Nevertheless, we see many starting points and opportunities for this, as society has learned a lot in the past few months with regard to health and the environment as well as digitalisation.

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Sabine Georgi is an Executive Director at the Urban Land Institute for the DACH region (Germany, Austria, Switzerland). The graduate in business administration (BA specialisation in real estate) and Certified Real Estate Investment Analyst has now been working in the real estate industry for 25 years. She worked as a Country Manager at RICS; at ZIA Zentraler Immobilien Ausschuss as a department head for real estate and financial markets and as a consultant. Before that, she advised companies in the housing and real estate industry at the BBT Group consultancy and headed the marketing department. Sabine started her professional career at the Association of Berlin-Brandenburg Housing Companies (BBU) as a consultant to the board. During her studies, she worked for various companies in the real estate industry.

Part IV

Implications for Office and More: Cities to Work

The Flexible Office Space

Franziska Plößl and Tobias Just

Abstract

An Europe-wide survey of real estate professionals suggests that the COVID-19 pandemic has highlighted qualitative changes in the world of work more than quantitative demand shifts, because flexibility is becoming paramount. This applies to office space and buildings as well as working models and contract structures. Overall, survey participants expect that possible demand declines due to more people working from home or at third places can be largely offset by larger collaboration or co-working areas. Such areas, however, may be spread across more inner-city districts than before.

1 Introduction

Between March and October 2020, the Deutsche Hypo real estate climate index for office properties collapsed by more than 75 index points. In comparison, the financial crisis between June 2008 and January 2009 caused a similar drop of around 70 index points. Only after two years the value recovered to the pre-crisis level. Not surprisingly, one wonders whether it will take a similar period to overcome this crisis. Although there have been initial signs of recovery in the assessment of the office segment in recent months—and other leading indicators at least in the expectation component are pointing upwards again, too (Henger & Voigtländer, 2021)—the actual level of the Deutsche Hypo real estate climate index for the office

F. Plößl (✉) · T. Just
IRE|BS International Real Estate Business School, University of Regensburg, Regensburg, Germany
e-mail: franziska.ploessl@irebs.de; tobias.just@irebs.de

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segment is currently still roughly 50 index points below its pre-crisis level (bulwiengesa & Deutsche Hypo, 2021).

The survey of commercial real estate financiers showed a similar picture: As recently as 2019, the IRE|BS German Debt Project showed that financiers had placed particular focus on the stability of the office investment, because residential and office segments were among the winners in new financing business (Just & Wiersma, 2020). The survey in the first COVID-19 year 2020 showed a very mixed picture: some financial institutions were cautious while others were slightly optimistic about the office segment. Overall, however, the perspective for the asset class was assessed much more sceptically than before the pandemic.

This is also shown by survey results[1] on the user side collected for this publication: if, before 2020, over half of employees were working from home for half a working day per week at most; this proportion has fallen to 16%. At the time of the survey, nearly 40% of all respondents were doing more than half of their weekly work at home (see Fig. 1).

This shift towards remote work poses major challenges for employers and employees (among other things, in operations, in setting up new infrastructures for information and communication technologies, for motivation and all this has an impact on working time and thus also on the productivity of employees; see also chapters "Office Work in Post-Pandemic Cities and the Importance of Population Density", "It Is about Responsibility, Technology and Culture", and "The Screen Cannot Replace a Sense of Community"; Alipour et al., 2020; Bartik et al., 2020; Bennedsen et al., 2020; DeFilippis et al., 2020; Malkov, 2020) and calls for flexible structures and office space (JLL Global Research, 2021; Stettes & Voigtländer, 2021). Media coverage conveyed a gradual and rather recent mood brightening for the prospect of the office markets. At the beginning of the crisis, pessimistic voices predominated in the headlines such as "Bürosterben nach Corona" (Office deaths after COVID-19) (Dietz, 2020). As the situation unfolded, both the limits of working from home and the advantages of shared company space were more clearly outlined. Then the media said "Mehr Mut zu neuen Arbeitsplatzkonzepten" (Bold new workplace concepts) (Frensch, 2021) and "Trotz Corona und Homeoffice: Das Büro stirbt nicht aus" (Despite COVID-19 and work from home: The office is not dying out) (Die Zeit, 2020), but how will the office real estate market change now?

2 Office Properties: Survey Results

Of the survey participants, 269 were mainly concerned with office properties and answered the question set on offices. With 514 free-text answers on the "normality" of office space after the pandemic, this group provided the largest participation.[2]

[1] Together with the Product Councils of ULI Germany, an extensive questionnaire was drawn up in German and English, which was answered by a total of 421 participants in Europe in March and April 2021.

[2] There was also a high level of participation in residential real estate with 513 free-text answers.

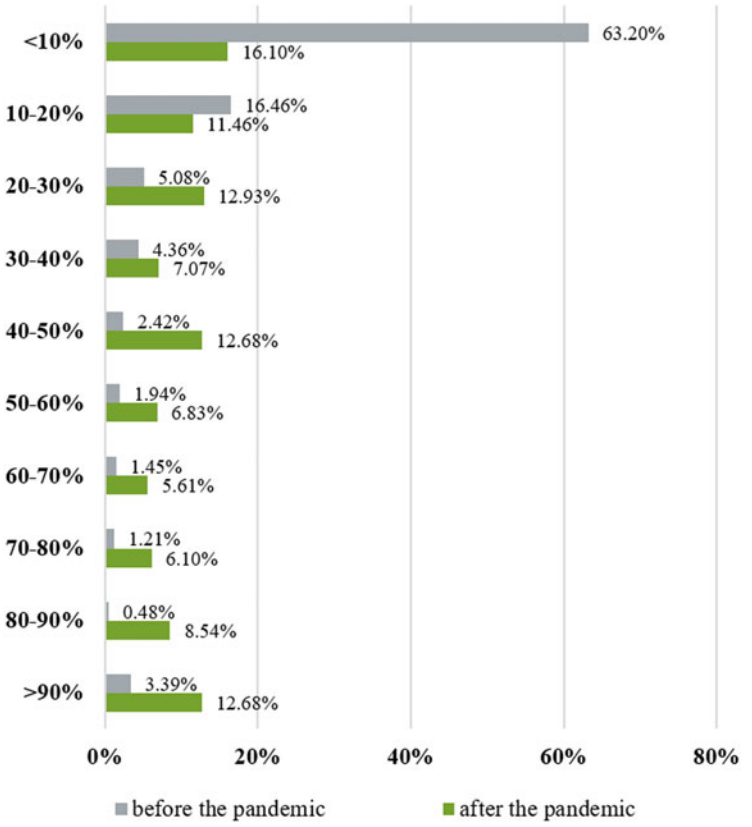

Fig. 1 Working from home before and during the pandemic (share of weekly working hours). Notes: Own data collection on the question "How often did/do you work from home?"; 1.90% or 2.61% of the participants in the survey on the office asset class did not provide any information

For the next 10 years, a good 40% of those surveyed expect a (mostly moderate 0–10%) increase in demand for office space in urban areas; as for flexible workspaces, around 70% of the participants expect space to grow, and significantly more participants expect a strong growth in demand for flexible space rather than for traditional office space. While the majority of participants expect demand for flexible space to rise across all regions, around a third of the traditional office space anticipates a decline in space, especially in rural areas (nearly 50%, see Fig. 2). This can also be found in the free-text answers: 91 answers reflect the expectation of lower hence optimised demand for office space; offices are increasingly becoming meeting places (65 answers) where collaboration progressively takes centre stage. The increasing importance of co-working is noted in 18 answers.

Overall, survey participants expect that possible losses in demand due to more people working from home can be offset by larger collaboration areas. What is more, the distribution of the expected surface growth across all location types also suggests

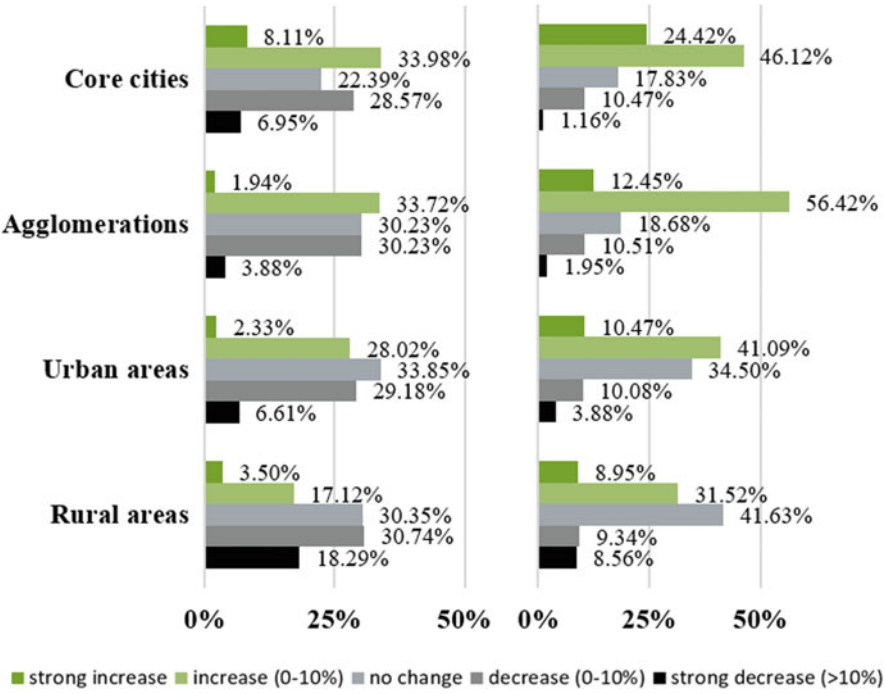

Fig. 2 Outlook for office space (left) and flexible workspaces (right) demand over 10 years. Notes: Own data collection on the question "Please estimate the demand for office space and for flexible workspaces (co-working) in the following regions for the next 10 years"; 3.72% / 4.09% / 4.46% / 4.46% / 4.09% / 4.46% / 4.09% / 4.46% of the participants in the survey on the office asset class did not provide any information; definitions according to the Federal Institute for Building, Urban and Spatial Research (BBSR): agglomerations—regional centre over 300,000 inhabitants, urban areas—regional centre over 100,000 inhabitants, rural areas—without regional centre over 100,000 inhabitants

that redundancy areas should be expected. Thus, the model of a fixed desk in the city centre is transformed into one where employees share fewer tables in the centre, and enjoy access to more workplaces in fewer, flexible central spaces.

The likelihood of a structural change in the use of office space after the pandemic seems fairly high given that 78% of those surveyed believe that fixed workplaces are no longer required. Due to the increased use of video conference systems in 2020 and 2021, the survey also shows that meetings in the office can sometimes be dispensed with, or that some can be conducted from home or via mobile devices. On the other hand, the office seems to retain its importance for soft factors. The clear majority of those surveyed regard established office properties as not (or not easily) replaceable for both social interaction and the resulting corporate culture, employee loyalty, and the capability to manage innovation (see Fig. 3).

Survey participants see clearly the advantages and disadvantages of working from home (see Table 1). Advantages concern hard economic considerations (saving

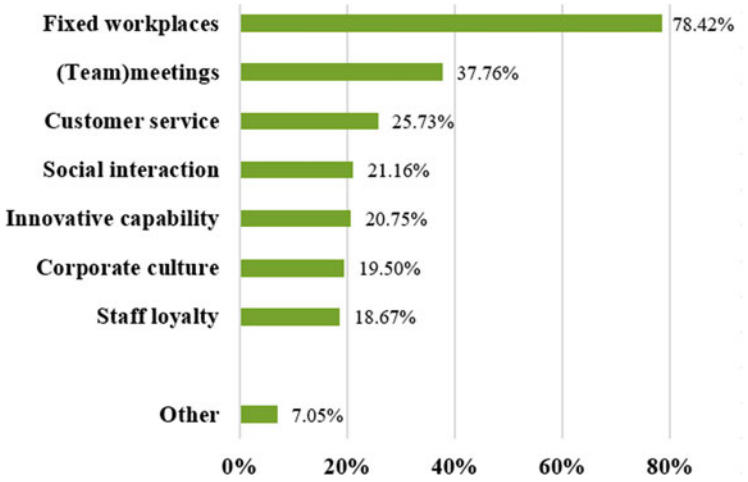

Fig. 3 Fixed workplaces at offices can be replaced. Notes: Own data collection on the question "Which aspects of office properties can be replaced for its users after the pandemic?"; multiple choices possible; 10.41% of the participants in the survey on the office asset class did not provide any information; most frequent mentions for other: aspects can only be partially substituted/are supplemented by digital formats

Table 1 Main advantages and disadvantages of working from home for companies

Advantages		Disadvantages	
Increasing attractiveness as an employer	78.33%	Negative impacts on teamwork	78.33%
Cost reduction due to reduced space	72.24%	Loss of ability to innovate	68.82%
Less days of sickness of Employees	50.57%	Legal and insurance aspects	49.05%
Increase in employee Productivity	27.76%	Loss of control over employees	31.56%

Notes: Own data collection on the question: "Please select the key advantages and disadvantages of a home office for companies."; multiple choices possible; 2.23% of participants in the survey on the office asset class did not provide any information

costs, 72% of those surveyed; increasing productivity, 28% of those surveyed) and dimensions that are comparatively harder to quantify (e.g. increasing attractiveness as an employer, 78% and improving the health of employees, 50%).

Similarly, hard and soft factors also work together on the side of disadvantages; some seem to contradict the advantages—at least indirectly—because losing the ability to innovate would obviously reduce productivity. This ambivalence can also be found in free-text answers, in which 46 emphasise that working from home will gain in importance, while 12 respondents state the contrary. This indicates that long-term remote work might not be suitable for all employees.

This suggests the conclusion—which Just (2020) highlighted—that organising remote work represents a new management requirement as an additional tactical

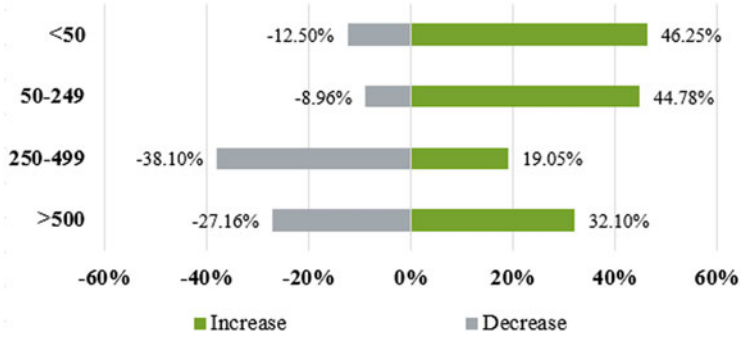

Fig. 4 Company size and assessment of flexible workspaces. Notes: Own calculations; there is a weak correlation between the number of employees and the demand for flexible workspaces in rural areas; Chi-square test, $\alpha = 0.1$; χ^2 $p = 0.007$; Cramer's $V = 0.1881$

decision-making parameter, because the optimal solution can be different for different companies, teams, and tasks. There is no guarantee that, for a special team in a specific company, a certain proportion of remote work represents a stable and permanent solution for every project or a blueprint for another team/project. A familiar certainty disappears, i.e. the service performance at the employer's office. The answer to this loss of certainty must be a greater degree of flexibility.

This is exactly what is found in the free-text answers with 97 responses: flexibility is becoming more relevant, and this applies to both office space and other possible work models (see chapter "The Future Workplace: Reimagining the Office for the Twenty-first Century"—Kane, 2021); the desire for increased flexibility is not new and can be found across all asset classes, but it has come to the fore in offices. With the conception of more flexible space structures, the space requirement for the core workplace could be reduced and the focus could be more on social functions and the quality of stay, while more flexibility is promised through shorter lease terms. Most of the respondents expect the share of space to increase in the future in communal areas (75%) and meeting rooms (65%).

There is also a slight difference in the assessment of the future demand for flexible workspaces in rural areas based on the number of employees; employees at larger companies tend to expect an increase in core cities rather than in rural areas (see Fig. 4). In turn, this could suggest that metropolitan areas are points of attraction, especially for young people, and remain centres for social exchange and creativity. However, it could also just reflect that there is a kind of home bias in the responses, namely because employees in larger companies also tend to come from larger cities and, therefore, consider their own, familiar environment to be stable.

Such reliance on metropolitan areas by large companies does not arise in the overall sample: the region where a survey participant works seems to be a valid predictor of where future additional demand is expected. Even the peripheral area tends to perform more positively than metropolitan areas concerning the expected

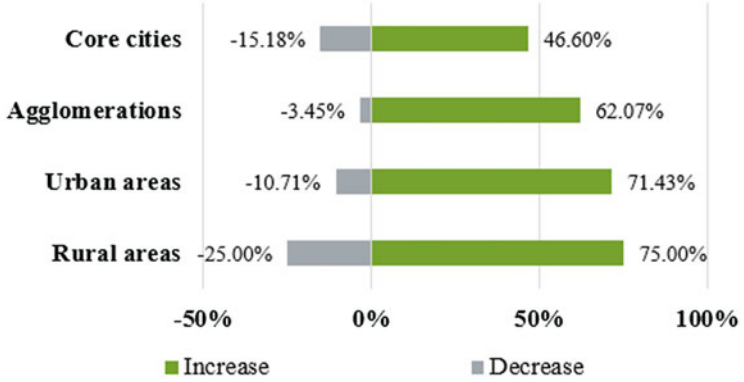

Fig. 5 Location of the office and assessment of flexible workspaces. Notes: Own calculations; there is a weak correlation between the work region and the demand for flexible workspaces in urban areas; Chi-square test, $\alpha = 0.1$; χ^2 $p = 0.033$; Cramer's $V = 0.1639$; definitions according to the BBSR: agglomerations—regional centre over 300,000 inhabitants, urban areas—regional centre over 100,000 inhabitants, rural areas—without regional centre over 100,000 inhabitants

additional demand for flexible space (see Fig. 5). The concept of flexible use of office space is finding its way out of the cities and into the outskirts.

The development could be promoted by the fact that the commuting pain seems to weigh more heavily than in the past: the proximity to housing gains 21 percentage points for the quality assessment of an office location compared to the pre-crisis period, and underlines the interlinking of the residential and working worlds. The same applies to the proximity to health and social facilities or art and cultural sites, while positive synergies from retail and hotel uses become less relevant. Workspaces might then tend to move from the Central Business District to several small districts. This is partly done by relocating individual departments, but more often by offering space at the same time, so that employees have several options for their workplaces albeit subject to a new organisational division of labour (see chapter "Office Work in Post-Pandemic Cities and the Importance of Population Density").

3 Final Remarks

The transformation of the world of office work has experienced a major boost due to the far-reaching infection protection measures. Survey results show that the "dying offices" in cities should not occur to the extent initially feared, even if working from home and remote working remain an integral part of working life. Overall, there is at best a weak indication in the survey results that—in line with the expectations of participants—there could be a decrease in demand in core cities. More important than the quantitative dimension is the qualitative shift in office demand: flexibility of office space, office locations, and office buildings are becoming increasingly relevant. And this applies not only to core cities and central business districts but

increasingly to the outskirts. In turn, this would imply that the demand for office space in core cities is not lost due to lower overall demand, but rather to higher demand in numerous new locations that are close to home. Demand for collaboration and compensation areas has a supportive effect in the city centre. Both aspects together could reduce the productivity of the area and consequently lower the willingness to pay.

For project developers and investors, this means adapting their concepts to the changed requirements of users and the increased need for flexibility, and embedding them in a social environment. Alternatives to highly flexible areas/buildings are very specific, quasi-tailor-made buildings for a specific corporate implementation. This would require a much better knowledge of the user. Correspondingly, this strategy is preceded by thorough data collection and analysis, especially since the risk of a user change remains and the landlord's room for negotiation is reduced, i.e. the counterparty risk would rise. The alternative of the highly specific property is probably more relevant for owner-occupiers.

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Franziska Plößl is a Research Assistant and doctoral candidate at the International Real Estate Business School/University of Regensburg. Franziska studied Real Estate Business (MSc) at the University of Regensburg and International Real Estate (MSc) at Florida International University, graduating at the best of her class. She has published on various topics, including CREM, nursing homes, and megatrends, in the real estate industry.

Tobias Just is a Managing Director at the IRE|BS Immobilienakademie and professor of Real Estate at the University of Regensburg. Tobias studied economics in Hamburg and Uppsala (Sweden). In 1997, he started to work at the University of the Federal Armed Forces Hamburg. His PhD dissertation was awarded the university science prize in 2001. For more than 10 years, Tobias worked at Deutsche Bank Research. He headed the unit's sector and real estate team and was a member of Deutsche Bank's group-wide Environmental Steering Committee. In 2006, Tobias was a Research Fellow at the American Institute of Contemporary German Studies at the Johns Hopkins University. Tobias published more than 200 papers in professional and academic journals and books. Until 2021 he was President of the German Society of Property Researchers and is the editor of the ZIÖ—the German Journal of Real Estate Research. In 2018, Tobias became a Fellow of the RICS by nomination.

The Future Workplace: Reimagining the Office for the Twenty-first Century

Chris Kane

Abstract

The debate about the future of the office has taken on a life of its own following the 2020 lockdowns. The viability of the home working experiment at scale has spawned lots of challenges and opportunities. So much so that the traditional ecosystem of commercial property investment is under challenge, together with the viability of the traditional office from both the supplier and users' perspective and even the future of city centres is being evaluated. COVID-19 has shifted the focus to the people aspect of the equation and how and where work will be carried out given the rise in importance of employee health and wellbeing. Never before has there been a greater need for a holistic approach to reimagining the office for the twenty-first century. This chapter is based on engaging a broad range of diverse contributors with a wealth of experience and expertise in dealing with various aspects of the built, technological and workplace landscape, including the health, wellbeing, anthropological, behavioural change and sustainability factors. It concludes that the traditional 'one size fits all' approach is obsolete and we need to frame fresh perspectives on both the delivery and consumption of commercial real estate.

In collaboration with Eugenia Anastassiou.

C. Kane (✉)
Six Ideas UK, London, United Kingdom
e-mail: chris.kane@sixideas.com

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1 Introduction

This chapter aims to help readers to appreciate that the state of the office market in 2021 is not like any prior market downturn. The fundamental changes to the nature of demand require us to go back to first principles and ask ourselves what is the purpose of the office? Current circumstances have certainly thrown a massive spotlight on the unexciting world of office work, so that the mainstream press now regularly feature pieces on the 'death of the office'. It might make for sensational headlines, but we do not believe that the office is dead or dying, just that it is not going back to normal. At the ULI Europe Conference in February 2021 this point was argued in a debate on the motion that—*the office building has a strong future*. Our view is that offices will only have a strong future if the commercial real estate (CRE) industry accepts that it needs to change its operating model and update the system for providing and operating buildings.

The pandemic forces us to consider options and scenarios which are unprecedented, complex and pose real dilemmas in the ways we live and work. Looking at the future of the office debate, the property industry has to come to terms with the realisation that the old way of doing things (aka the traditional office leasing model) is not going to cut it post-COVID-19. The pandemic has not only changed the ballgame but the entire stadium.

1.1 The Need to Reimagine the Office

For many players who are investors or property companies on the supply side; the hope is that this will play out like any other market downturn. For office occupiers this pandemic has fanned the flames of change into a firestorm when it comes to figuring out how to attract and retain the best talent, how to gain competitive advantage and sadly for many businesses, how to survive. For those of us interested in corporate real estate and the built environment the rationale for reimagining the office may not be immediately obvious. As a default many practitioners would argue that if something is not broken, then there is no need to fix it. Yet the real estate office sector continues to rely on the assumption that occupiers will always need space. We believe that this is the industry's Achilles heel in today's environment.

For example, whilst many parts of the economy have shifted from analogue to digital the supply side of the property market is lagging well behind the curve in harnessing the digital dividend. By taking a look at the leasing system it still retains much of its mediaeval roots. On the consumer side enterprise embraced new technology as a business imperative. Cloud technology had the effect of liberating the office worker from the desk 15 years ago as many companies adopted agile working practices. The 2020 lockdown made it possible for most businesses to consider not only working from home but working from anywhere. The office building per se is not obsolete but the system needs an overhaul. By system is referred to how we both produce and consume commercial real estate. We all need to come to terms with this new paradigm one based on a shift from fixed to fluid where

the human is centre stage. We are not entering into the next industrial revolution but rather the 'age of human' one based on distributed workforces working in a multi-dimensioned manner and supported by distributed workplaces—omniworking.

As a first step, the real estate sector needs to accept that there are fundamental changes taking place in the market and we identified four key drivers which the corporate real estate industry should consider[1]:

- The fragmented supply process involved in delivering and managing an office building focuses almost exclusively on technical skills, whereas the ultimate consumer who pays the rent wants not just to shelter, but a customer experience. An offer which enables their business to be productive.
- As Natalie Charles from BNP Paribas Investment Management argued at the ULI 2021 debate the investment management world has two customers—the pension funds and the occupier. This dilemma has been a long-running one, but COVID-19 might have given the latter the upper hand.
- The role of the office has changed irreversibly as it is no longer a place where workers have to go to Monday to Friday and 9 to 5.
- An office is no longer an asset in the eyes of occupiers but a commodity. Many corporate tenants now wish to consume this product on an 'on-off' basis as required. Rather than the building specification their focus is now on the provision of service.

The real estate industry might try to look beyond the pandemic to create a vision for twenty-first-century workplaces which inspire employee engagement, foster creativity and increase productivity. Whilst also improving an enterprise's capacity to compete and create value in all its guises. By working together both landlords and tenants of commercial real estate can create effective and engaging workplaces which play their part in leaving a more sustainable 'built' legacy for future generations. Given that commercial buildings generate account for almost 40% of all greenhouse gas emissions this cannot be ignored as it is now an urgent consideration. This was reinforced in a Financial Times article in February 2021 by ULI CEO Ed Walter who commented that: 'climate change is already having a significant impact on the places where we live, work, learn and play, and recognition is growing across the real estate industry that now is the time to take action' (Hammond, 2021).

[1] Selected portions of this chapter have previously appeared in Diming et al. (2021), Fresh perspectives on the future of the office: A way forward, *Corporate Real Estate Journal*, 10(3): 271—284.

In crafting this holistic approach, I have sought the input of a broad range of diverse contributors with a wealth of experience and expertise in dealing with various aspects of the built, technological and workplace landscape, including the health, wellbeing, anthropological, behavioural change and sustainability factors.

I owe them all a huge debt of gratitude for coming together as a Six Ideas team to help frame this narrative.

1.2 The Real Estate Context

Until recently the demands of commercial real estate were quite straightforward. Guaranteed by the fact that people needed office space to carry out their work and supply was limited ensuring property values would rise. The institutions funded the development risk and leases underwrote capital value, this provided secure and steady income. Managing agents administered the service charge and collected the rent. Occupiers generally sought to minimise costs, so their needs were predictable in their quest to cut costs. So, fit-outs were quite generic with identikit office buildings spreading across city landscapes across the world. However even pre-COVID-19 the 'build it and they will come' model was beginning to unravel as corporate occupiers sought to rethink their approaches to real estate, based upon efficiency, cost savings and client shifts in approach, as overriding mantras. Subsequently, patterns of work started to change bringing health, wellbeing, sustainability and a 'people-first' focus to the front and centre. The ubiquitous explosion of technology in parallel meant that office work was beginning to migrate outside the confines of the office and could be done anywhere. The natural office/work chain no longer necessarily requires an office. Fundamental changes to business, the economy, society and the environment, having been thrown around in the pandemic, underpinning a seismic shift in the relationship between real estate, occupiers and investors.

Over the medium to long term more and more occupiers will choose to turn some of their real estate 'on and off', rather like other corporate resources in their businesses (capital, human and equipment). However, there are huge hurdles to overcome in structure, process and incentives. This is not helped by the fragmented nature of the real estate ecosystem where all the key stakeholders have different views and vested interests in how the system operates. The first step for the property world is to step outside from a traditional predominantly introspective box and acquire fresh perspectives and opportunities in going beyond a 'one size fits all' mentality. A step beyond the normal boundaries of return on investment, yield, rental rates and risk enables to see the big picture. The impact of lockdown has copper fastened lots of business changes already in train. In order to re-frame our perspective awareness should be created by examining the challenges faced by all the stakeholders.

2 A System in Need of Overhaul

Real estate is still managed by using metrics from the industrial age when thinking about humans not too different from machines who needed to be housed efficiently in order to be productive—the arrival of knowledge work has changed all this. Even pre-COVID-19 it was almost universally true that there was an element of white-collared work which did not have to be done in an office and the pandemic proved that we should gradually be moving into space as a mindset rather than a physical attribute. This will require major adjustments for many stakeholders and not just for those in the property world. It is recognised there are some significant obstacles

impeding progress, especially in the post-COVID-19 era—in real estate, the built environment, in organisations, in the way technology continues to rapidly disrupt and impact, and putting people at the centre of the proposition.

2.1 Barriers in the Built Environment and Real Estate

Investment barriers preventing mixed-use buildings—One of the deep-rooted problems is the way large institutions, REITs, insurance companies and pension funds invest in property (development). The rationale is that institutional investors prefer designing their own portfolios and that special-purpose properties are easier to sell, as mixed-use always offers some superimposed diversification from the vendor. Therefore, institutions often insist on a generic building design so that they can put these buildings onto the marketplace at any point in time and have maximum exposure to different buyers. This is the reason for identikit business centres across the world with formulaic square tall buildings, which can be sold quickly and easily across the marketplace, like any other commodity. To give an example, 'Ford Motor car' buildings are currently developed to satisfy institutional demands. In the future, custom-made buildings for different kinds of uses and to satisfy the requirements of the end user are required. A large part of that process needs to change to accommodate more mixed-use, multi-purpose buildings. In addition, rethinking our approach to how office buildings are operated and managed is essential. This is a crucial element given the importance of the occupier experience when tenants consider new space.

Re-shaping cities and the CBD—Cities are entrenched in the networks that characterise the economy where you commonly have the seat of corporate power located in certain places and as a result goods, information, knowledge and technology flow through them. Now with the dangers of the pandemic (and a heightened awareness of potential future pandemics) and the increase in remote working, the CBDs are emptying out. If we think about it logically the impetus and status of going to city centres to work is eroding, especially since only 12% want to return to the office full-time and 72% prefer a hybrid remote-office model (JLL Research, 2020). Future use of CBDs is already being questioned, if the majority of people are coming into a central city office for only two or three days a week. We cannot stop engaging with city centres because there is too much invested in them, literally, metaphorically and culturally. It is the way we engage with them that needs to be reshaped. It is time to reimagine city centres with a greater mix of uses and activities. Could this be a new opportunity? Architect Lord Foster states in a February 2021 interview with the Financial Times that 'COVID offers (the) opportunity to reshape cities' (Hammond, 2021). This is also the view of Harvard Professor Edward Glaeser, based on his forthcoming book 'The Survival of the City: Human Flourishing in an Age of Isolation', who writes that 'whilst COVID-19 will cause some pain to London's commercial landlords, the city has endured worse' (Glaeser, 2021; Glaeser & Cutler, 2021).

Going from Castles to Condominiums—This term first appeared in 2020 in a report published by RICS authored by Rob Harris entitled 'The Age of Unreal Estate'. That paper highlights some interesting concepts such as—traditional company buildings were constructed like castles; bastions of power built to last for decades, with each organisation going into its own impenetrable 'work fortress' (Harris, 2020). However, what is needed is a move towards a model where we are building condominiums. Built for short, medium and long-term requirements, on-demand and when required, with the added feature of the space being operated as a service. The most recent reflection of that shift occurred over the last 15 or 20 years with the arrival of the flexible space market. Pioneered by Regus/IWG and followed by an expanding range of players (Convene, Serendipity, The Instant Group and others) the most notable being WeWork: these organisations are providing space by the month, day or even the hour; even major hotel groups such as Marriott are getting in on the act. For the first time ever the consumer of the built environment realises they have choice and the imperative for providers is to supply a wider range of alternatives tailored to their needs.

2.2 Embracing Technology and its Impact on Work

Understanding technology and the application of ethics—We do not quite understand how systems like Artificial Intelligence (AI) fit into our lives and by extension our work and workplaces. One thing is certain that AI will drive fundamental change in how office activities and processes will function in the near future. As a problem-solving tool AI offers an exciting prospect of improving the human condition by helping us advance in many beneficial ways. However, there is a potential dark side which cannot be ignored and can be used against our interests—this includes cyber-attacks, social and political manipulation, dissemination of false information and promotion of vested financial interests. People are also apprehensive about the accumulation of data and how it will be used in terms of privacy rights. To try and partly address these concerns the EU introduced the General Data Protection Regulation (GDPR), and the USA is looking into how it will introduce a federal-wide legal framework. However, there is a really wide gap regarding the ethical and legal governance surrounding intelligent systems which is years behind the advances made in technology. It is now incumbent on those involved with the advancement of AI and other tech systems to bring an ethical lens into what they design and build. For organisations this has opened another aspect of business ethics which has enormous societal ramifications. This cannot be ignored especially when one considers the Deloitte December 2020 survey of CFOs who forecast that by 2025 offices tasks will be carried out equally by humans and automated (Deloitte UK CFO Survey, 2021).

The danger to the traditional workforce—As technology grows exponentially and becomes increasingly prevalent in every aspect of our lives, what is regarded as the middle ground of skills, will be done by intelligent devices. This will be a challenge to many office workers whose jobs will be hit with AI and automation as

much of what they do is more predictable, repetitive and less innovative and creative. However, the jobs where human qualities, like empathy, emotional intelligence, soft skills and value-based judgements are important, will survive in the long term. These are the qualities which are our Unique Selling Proposition (USP) as human beings and have tended to be disparaged in the world of work. To put this in context the World Economic Forum, 2020 Report forecast that by 2025 some 85 million office type jobs will either disappear or be displaced by change. On a positive note, they believe that up to 95 million new digital roles will emerge. Furthermore, the report predicts the time spent on current tasks at work by humans and machines will be equal. For decades middle-management has experienced a lean-management culling. This will be a real shock to society because historically they have been 'the untouchables', as that middle strand has always pretty much sailed through, reinventing itself and enjoying continuous employment prospects (World Economic Forum, 2020).

2.3 Changing Organisations and Business Management

The status phenomenon—During the past 50 years corporatism's mantra was 'big is beautiful', with one function of the office being part of the big is also powerful phenomenon, which was perceived as being attractive and aspirational. Working in those big shiny status pieces used to be a driver to attract talent, but this will now shift to places which provide better human-centric working environments. People will still need to go somewhere for face-to-face collaboration, to meet and engage with people, so the 'big is better' rule is breaking up and there will be a much greater role for smaller, dynamic, more networked businesses and teams than ever before who can adapt to people's needs better. Mark Thompson former CEO of the New York Times and Director-General of the BBC provided an interesting C-Suite perspective on this revolution in team-working in his foreword to the book 'Where Is My Office?' where he stated that the revolution: 'One of the few positive impacts of the coronavirus crisis may well be a further acceleration of our transition from the regimented offices of the past (and the archaic management philosophy that built them) to something more flexible, more individuated, more human-shaped' (Kane & Anastassiou, 2020).

The hierarchy silos—Fortunately, things have moved from the bad old days of the executive wash-room, which was kept under lock and key, so underlings would be impeded from sharing facilities with their 'superiors'. However, organisational hierarchies still exist, and people are not going to abandon them. A large number are not going to shift their mindset because of vested interests, easily accepting the system and the way things have always been done.

The workplace division silos—For the enterprise, their central support areas—Corporate Real Estate/Facility Management, Human Resources (CRE/FM, HR) and Tech—have differing agendas and views of their role within the organisation. This divergence has existed for many years, but will this still be sustainable now in the post-pandemic organisation? The problem has also been exacerbated by the fact that

many non-core activities have been outsourced to third parties, thus inhibiting innovation and investment. As a way to move forward and make progress, barriers put up by organisational silos and siloed thinking between internal support systems should be broken down. These groups are to be encouraged to take up a joined-up approach to provide much greater strategic support for the enterprise, as it navigates post-COVID-19 uncertainty.

Managerial styles stuck in a pre-COVID-19 rut—The speed in which organisations had to shift to mass enforced remote working because of the pandemic lockdowns was phenomenal and many were totally unprepared. This meant that management did not have time to adjust to the change in quite the same way, as if there had been an organic development of flexible systems and remote working in their organisation as a result of internal cultural changes. Therefore, presenteeism in the office did not die—it just moved online. It was replicated virtually in terms of managers monitoring and constantly checking in and checking up on their workforce at home. This is in part due to high cultures of hierarchy and control, especially within certain industries like finance and in the legal profession, where employees are judged based on being observed in working a certain way.

The changing ecosystem of companies—However despite those who want to cling on to the old managerial styles and the 'big is beautiful' corporation, the economy is changing rapidly from this corporatist model. The days of longstanding and stable multi-national corporations may well be drawing to a close. A 2016 McKinsey study indicates that average life expectancy of corporations on the S&P index will be 14 years by 2026, down from 33 years in the 1960s (Garelli, 2016).

The traditional office versus adaptive, human-centric spaces—The same old traditional office will still exist, simply because some organisations and their leaders are not early adopters. Many will be slow to act differently until it becomes the norm and that only happens when there is some kind of legal/taxation change or a universal demand for change. There are early signs that some policy makers are starting to consider the world of remote working both in terms of protecting worker rights and also promoting tax incentives to rebalance economies. According to a Deloitte 2021 survey on CFOs post-pandemic thinking, foresighted business leaders have seen that by reducing the amount of space they take up; they can make it more interactive and more resourceful. The potential of their workplaces is re-envisaged by looking at their space resources, IT and collaboration requirements. They will then set out to provide their people with adaptive spaces as and when they need it. There is also minority mindset which has more radical views about the alternatives to space by putting people, wellbeing and sustainability at the centre of the proposition (Deloitte UK CFO Survey, 2021).

2.4 The People Factor Comes to the Fore

Problems for business leaders and managers—One can understand that the predictability of the '9 to 5, Monday to Friday' routine was quite helpful in managing vast groups of people to move in a certain direction to meet organisational goals.

However, COVID-19 sounded the final death-knell to those standardised norms in some industries and whilst it is generally accepted that we will not be reverting back to exactly where we were pre-pandemic, we will not be going into an entirely different world either. More realistically the COVID-19 accelerant has brought about more flexibility and choice in the ways we work. From the typical manager's perspective, managing half their teams at home, the other at the office and some in a suburban hub frightens them. They are thinking 'How can I make sure work happens efficiently and goals are met when everyone's in different places?' Right now, we are dealing with remote/home/anywhere working, but without the philosophies that go along with it, because there must be a new paradigm of management and a new paradigm of working, which we have not come across before on such a mass scale—especially since in many cases the managerial style in most companies has not been adapted to implement it.

Challenges for employees—People's response to enforced remote working during the pandemic was not without its issues, complexities and disparities, and evident in the way different individuals responded to it:

- In many cases people's homes/apartments are not conducive to permanent and continuous working.
- Some find it very difficult to divide work and home/family life.
- Most appreciate not having to do the daily commute; conversely others miss it because it is their down-time.
- Those who are disciplined organise themselves quite well—they require a manager who understands that independence by letting them just get on with things without micro-managing.
- Others who work better in structured environment are out of their depth without the rest of their team for support; and want managerial supervision and guidance.
- Middle-aged and older people who have done all their networking and business relationship-building are more content with remote working.
- Younger people cannot wait to get back into the office—they miss their mentoring, training, networking and socialising with their colleagues.

This real-life shared experience proved once again that 'one-size does not fit all' in the working from home (WFH) versus office debate. Although it has created an appetite for employees wanting to explore new options in how they can work, with a large majority declaring an interest in hybrid remote and office working options; with the focus on making sure the workplace is safe.

Individual choice versus management—We have also entered the age of individualism, where it is accepted that we all have our different ways of working, thinking, learning and understanding. As the neurodiversity narrative crosses over into the workplace, this will be another set of challenges for organisations and management. As blended and hybrid working will become more widespread, individual choices will become drivers in how we work. So, employers will have to factor these additional elements into the managerial remit to attract new talent. For example, people will come to accept that working life will not be linear like the traditional

career path. It will end up being a zigzag pattern, as individuals step in and out of work for the different demands of their lives, whether it is having and raising children, being a carer or taking time out to volunteer or travel. Also, as AI and robotics become more prevalent, the work lifecycle will also have to include more re-training/upskilling as technology progresses and roles change. So, this is where effective leadership is so important because they have to manage that shift to cater for different people and for different parts of the process.

The freelance versus full-time employee dynamic—What the pandemic has also demonstrated is that the whole concept of the employer/employee relationship has started to erode. With people increasingly working as individual consultants for themselves or on a freelance basis they no longer have that same kind of social contract with an employer. The emergence of the gig economy[2] and ascendance of freelancers has been catapulted to greater heights by COVID-19, at least in the USA. According to a 2020 Forbes editorial on freelancing, 90% of US companies depend on freelancers to augment their full-time staff. Moreover, there has been a 40% increase in contingent workers who are not on the payroll and this figure is increasing (Younger, 2020). Conversely in the UK, a Financial Times report found that in 2020 there had been a massive growth in self-employment, but it stalled with the onset of the pandemic (Strauss, 2020). COVID-19 showed how isolated and difficult it can be for self-employed workers in the light of a lack of social security and government support. However, with so much uncertainty in the offing, UK businesses are deferring permanent hiring decisions and have started to recruit more freelance workers. In the USA and UK, most company leaders see hiring freelancers as an ideal cost-saving solution to attract good-quality talent on a project, part-time or consultancy basis to supplement their existing workforce or access skills and expertise they lack in their organisation. So, the dynamics of the way that people work, who they work for and why they work is changing and the working environment has to respond to that shift.

Heading towards a more human-centric working environment—Collaboration and adaptability will be key to ensuring that things come together effectively. This is a quality which applies to all of us, whether we are a manager, an employer or an employee—it is about being able to listen and be adaptable. We all need to change and be agile enough to adapt to see somebody else's perspective and accept that whatever we learn today, we might have to re-learn tomorrow. In the context of work, it means moving away from that patriarchal set of assumptions. It is becoming increasingly apparent that it has the potential to be replaced by a more equitable system where all things are connected. We all have a responsibility in becoming more aware of the issues and possibly even effect a change in the system.

[2]The gig economy defines a part of the economy where workers are given short-term service contracts instead of traditional contracts.

2.5 Bridging the Gap

So far, we have examined the chasms of mindsets, behaviours and systems in operation which inhibit progress in real estate, organisations and the way we work. COVID-19 has certainly proved to be the 'wake up' call for all these areas to rethink the paradigm and find ways to converge to enable headway to be made in what will be turbulent times ahead for all concerned. As far as the property world is concerned, there has to be a systemic change in the way real estate is funded, allied to how it develops, builds and supplies buildings. It has to take account of the needs of its clients, in other words the end-occupier or user of its spaces. The support functions—CRE/FM, HR and Tech—have to work together more closely and become more strategic in order to add value to the enterprise and facilitate alternative ways of working. The time has arrived for business leaders to consider amalgamating these functions. Business leaders, management and employees will have to find common ground in accommodating different working styles and how increasingly smart technology fits into their organisations.

3 Fresh Perspectives: A Reframing

3.1 Putting People First

Until recently due to the overriding 'build it and they will come' mentality in real estate, little thought was given to how individuals actually worked and how culture forms in the built environment. That is because the industry never really had to consider people's requirements as users, tenants, workers, community members, etc. Real estate will now have to put the people factor at the centre of the proposition to accommodate the best ways for them to work and collaborate in their buildings. In parallel, big and small organisations all over the world are also thinking about their place and purpose, as well as their survival, which should now go beyond just being about the search for efficiency, productivity gains and profits.

However, organisations (including real estate) cannot ignore the following pressing factors:

- people's health
- the wellbeing of the community
- the environment
- the consumer and the products they sell

These pillars make up a 'culture of health' strategic approach that links purpose, business productivity and profitability with talent attraction, sustainability for the wider benefit of the community and society.

The health and wellbeing agenda—This does not just mean sanitising and ensuring social distance in the workplace but encompasses the entire physical health and mental wellbeing element. Without a doubt the pandemic has spurred people to

re-define their priorities and attitudes to a different way of living and working. As people have become more fearful and stressed due to the pandemic, companies who listen and provide a better value proposition to their employees will become more attractive. Furthermore, it is now becoming clearer that we will be coping with 'pandemic times' for some time. According to Amanda Rischbieth Visiting Scientist at Harvard T.H. Chan School of Public Health, one way to gauge how 'healthy' an organisation is to measure its workplace wellbeing quotient. An example of one such framework is *The Harvard School of Public Health Flourishing Index* which goes beyond the typical sort of cultural workplace survey and shifts from a material framework to a much more holistic sense of what people find important. There are six domains in the survey, namely happiness and life satisfaction, mental and physical health, meaning and purpose, character and virtue. Close social relationships together with financial and material stability, plus the idea that if we could create places and spaces alongside working environments and network connections that progress those six domains. People at work should flourish more than just being 'happy at work' because they like their job or their boss. It has rigour because it brings in aspects of meaning and purpose, as well as the happiness and financial security elements. This is key since health and wellbeing issues are also wrapped around having financial security (VanderWeele, 2017).

3.2 Rethinking Business

The fundamental problem is that we operate in a model centred around the search for the economic 'holy grail' and we are now beginning to realise that in our aims to pursue productivity and profits we have caused damage on so many levels—environmentally, socially and culturally—and we are facing the process of losing our human values and our focus in life. One factor to consider is reimagining the relationship between the organisation and the people who work there. There is an emerging school of thought called 'humanocracy', led by business thinkers Gary Hamel and Michele Zanini who advocate for making it more symbiotic and people orientated (Hamel & Zanini, 2020).

Humanocracy versus Bureaucracy—In traditional bureaucratic organisations, people are seen as resources hired to create products and services through compliance to maximise profits. This assumes that in addition to earning a living, people wish to have an impact in the organisations they join. In these people-led environments employees are encouraged to think like problem-solvers, they are not sitting around waiting for somebody to tell them what to do. Employees are also given autonomy over important business decisions, and have the freedom to set their own strategy, to organise themselves as they see fit and to distribute rewards—plus increasing their salary when good business decisions end up being profitable. Leaders in these organisations should consider about becoming 'system architects' and try to build the values, systems and collaborative platforms that bring all of their organisational talent to the fore to develop successfully and reap the financial rewards.

Changing to a new organisational paradigm post-COVID-19—The effects generated by the pandemic across the world is being faced collectively to varying extents in one place or another. Additionally, we have the COVID-19 fear factor to contend with and that will dictate many of the choices and behaviours that we will see in the way organisations respond and manage it. We can drill down even further into how different companies and industries are responding to the pandemic. Some like Twitter, GitLab, Automattic have shifted to full remote work. Facebook, Microsoft, Google, Salesforce amongst many others, including Fujitsu, will be operating remotely for the foreseeable future and probably adopt hybrid or blended models once the COVID-19 danger subsides. Yet there are outliers such as Netflix and JP Morgan who view WFH negatively and want their workforce to return to the office 6 months after a vaccine. Owing to so much uncertainty right now regarding which direction to go next, it is evident that company cultures are trying to catch up and that one size or solution does not fit all.

Going from Fixed to Fluid—For some organisations, the processes of changing to more agile, flexible ways of working was already underway before COVID-19 hit. Companies who were already being led to work cross-functionally with flatter structures, reaped the benefits of being able to move swiftly and adapted faster to the crisis. This was all about business continuity and how it could be achieved by having people working in their own way or in different ways. It goes back to the simple concept of not having all your eggs in one basket and paradoxically the greater diversity of people, activities and locations in an organisation, the more resilience can be built into the system. These are also going to be the companies with more flexible orientations towards adopting hybrid or blended forms of work to enable them to make the transition into the post-COVID-19 era.

3.3 Omniworking™: The Far-Reaching Potential of Blending Fixed and Fluid Working

Omniworking presents the opportunities created by the shift from the traditional analogue way of providing and using workspaces to one based on the 'new reality' of digitally enabled working, which gives business leaders and an organisation's employees a wider range of choice in the way they work in a seamless, integrated and holistic manner. The system is inspired by the retail world's concept of omnichannel marketing, where the customer experience is unified and consistent across both traditional and online shopping platforms. Applying it to the world of work the omniworking model combines fixed traditional office space, with local hubs, flexi-working options, the fluidity of home and remote working and the 'borderless office', encompassing the increased prevalence of tech innovation, AI and robotics in the business environment. This gives people choice and understanding in how they work, whilst giving them the tools they need to build a shared working community. This will happen increasingly with progressively more sophisticated and connected technology, as we move towards the era of the 'borderless office'.

Environmental, health and societal benefits—With a focus on greater choice in working environments omniworking could also accelerate the decentralisation of work away from city centres, enabling people to work locally or nearer their home. This has the obvious advantages in cutting down on commuting, which is now a big concern universally with the return to the office post-COVID-19 and would also have a positive impact on the environment, by reducing emissions. Conversely, omniworking could also mitigate the 'fear factor' which workers are facing as they return to their workplaces. Through effective management and by deploying dispersed workforce strategies, businesses could find a viable and resilient set of systems in how they navigate the complexities of the post-pandemic working environment. The other plus is its wider implication for society—an improvement in peoples' work/life balance and their health, giving them more time to spend with family/friends and on their leisure activities, engendering a greater sense of wellbeing and community.

Lessons from the tech sector to manage omniworking—Making people part of the process and involving them in building the omniworking system to make it suitable for them and their organisations would naturally lead towards a more user-centred working environment. Taking a leaf from the tech world in the 1990s who would design products along the 'build it and they will come' model. The game changed (and profits soared) when they incorporated User Experience (UX) researchers into the development and design process who were tasked with finding out what users really needed. UX or design research utilises methods from social science, psychology and data science to understand the needs, desires or pain-points, in order to design products and services around people's requirements. Additionally, developing tech involves building and iterating a product over time, instead of focusing on the whole process at once. Since multiple possibilities exist within omniworking, that iterative approach is something that could be utilised when it comes to designing an omniworking model for each user. In this way organisations learn from management, employees, workers, contractors, what will make omniworking conducive to their needs and it is the sort of model that forward-thinking companies should think about which could actually help them manage people, spaces and working options that are useful for their specific demands.

4 Conclusion: A Call to Action

This piece was created by collating the views of a wide-ranging group based in the UK, Australia, Europe and the USA with expertise and experience in CRE, HR, technology, anthropology, sustainability, equality and diversity. It proved to be a great learning experience in which we overcame our unfamiliarity with one another and came together virtually to frame insights which are challenging, diverse and thought-provoking. We hold the view that the traditional mindset approach of 'one size fits all' does not work anymore; especially if it is applied as a response to dealing with business challenges post-lockdown. Particularly since enterprises now have a choice with regard to accommodating office work. Similarly, providers and

landlords of commercial real estate need to recognise that this also applies to the provision and operation of office buildings. So, for the first time ever two disparate unconnected players find themselves in the same boat. Put simply and through necessity, both parties who have never had to directly interact before now need to innovate and find a sensible way forward. In our view the first step in such a process is to seek fresh perspectives and fresh thinking. This is premised on accepting that a huge shift has taken place in how we consume and use office spaces which can be summed up by—a shift from fixed to fluid. In debating our approach to the future shape of enterprises and how offices are used, we concluded that the benefits of distributed and networked working outweigh the long-held mantras of centralisation and consolidation. However, to capture the competitive advantage benefits of moving in this direction one needs to recognise a variety of obstacles. Many of these are a by-product of a fragmented and antiquated real estate system, allied with the bureaucratic and centralised mindsets of most enterprises. Looking at these in the round we identified a chasm of misunderstanding across real estate, technology, organisational and people factors. By bridging this gap, we believe it would generate a significant source of competitive advantage. This could be applied to all stakeholders, enterprise leaders or real estate players.

We propose that these three areas are key to all stakeholders:

Looking beyond the building/asset:

We need to consider how people work and what they require from real estate as occupiers/tenants or users; as well as rethinking the relationship between the organisation and how it uses offices. We need to consider that office work/knowledge work can be done anywhere, anytime and anyplace. This impacts the enterprise in how they organise their space to accommodate work and this now has multiple dimensions. It needs to be delivered and consumed in a seamless cost-effective manner which respects our common bond of operating in a more sustainable manner.

Adopt to the emerging new reality of ubiquitous choice:

The omniworking label was selected as it represents multiple dimensions. It considers the complexity and interdependence of modular and knowledge working including interactions, patterns and the outcomes expected. It also recognises that things are continuously changing in the nature of work and the people doing it.

Reimagining the office:

We also need to reimagine how offices are funded, designed and built by asking ourselves the question—are they being designed and built to fit the requirements of those using them? As well as understanding that they have to operate in a smarter more sustainable and distributed manner.

As we are now all enduring a period of profound change it seems to us that we have a responsibility to come up with a set of fresh perspectives collectively to counter the challenges of today in order for all of us to shape a better future. Therefore, each sector should address the following:

For Developers/Investors:

- Consider understanding the needs of their users.
- Engage with the demand for flexibility and commodity products.
- Ensure that real state addresses wider social concerns.

For CRE/FM:

- Recognise and articulate the CRE/FM value contribution towards enabling the purpose of the business.
- Adapt to the change in emphasis on the physical place, based on the shift from fixed to fluid.
- Develop deeper collaboration with other corporate support areas.
- Devote time to understanding the strategic perspective and avoid getting stuck in a rut.

For Workplace Professionals:

- To improve or step-up the message about the strategic contribution/advantage in using your services.
- Develop a better way to describe workplace strategy options to replace—hot desking, ratio working and remote working, etc., by developing a language which is more human-centric.
- Consider the wider range of knowledge work permutations, beyond just office versus working from home.

By working together both producers and consumers of real estate can create effective and engaging workplaces which play their part in leaving a more sustainable 'built' legacy for future generations. In the words of John Ruskin: '*When we build, let us think that we build forever. Let it not be for present delight, nor for present use alone; let it be such work as our descendants will thank us for'*.

Contributors

Eugenia Anastassiou—Journalist and Writer. Co-wrote the book 'Where Is My Office? Reimagining the Workplace for the 21st Century' with Chris Kane.

Chris Diming—Workplace Strategist and Applied Anthropologist. Honorary Research Fellow at the Department of Anthropology, Durham University.

Rob Harris—Consultant and Analyst, Ramidus Consulting Ltd.

Max Luff—Work and Change Strategist, Six Ideas Ltd.

George Muir—Futurist and Innovation Strategist, Udal Cuain AB.

Amanda Rischbieth—Business, Sustainability and Health Strategist. Visiting Scientist at Harvard T.H. Chan School of Public Health and Advisory Practitioner Council Member, Harvard Business School Impact-Weighted Accounts Initiative.

Euan Semple—Digital Pioneer, Author and Business Mentor.

Anna Todorova—Head of Research for Measurement.

Caroline Waters, OBE—Work Strategist. Former Director of People & Policy at the BT Group. Deputy Chair of the Equality and Human Rights Commission.

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Chris Kane is Author, Advisor and Advocate, and co-founder of Six Ideas. Chris FRICS, FRSA is a portfolio professional, a Non-Executive Director, and a commentator on 21st Century Workspaces and Workplaces. His latest book published by Bloomsbury is "Where is my Office?" Six Ideas, is a distinctive community that brings together the very best strategists, researchers, and thinkers to help solve complex and seemingly impossible challenges that arise at the nexus between technology, people, culture, and place. Prior to such he was Head of BBC Workplace and Vice President CRE at Walt Disney. Chris combines this role with his Non-Executive Director activities which currently include Elstree Film Studios; having previously served on the boards of NHS Property Services, Reach2 Academy, Laganside Development Corporation, and Network Homes.

Office Work in Post-Pandemic Cities and the Importance of Population Density

Sabine Georgi

Abstract

In this interview, Annette Kröger, CEO North & Central Europe at Allianz Real Estate (Germany) discusses the importance of city density and the inner-city office space demands post-COVID-19 as well as the impact of hybrid remote and office working.

1. *The COVID-19 pandemic led to a widespread adoption of home office work. Since it began, there has been a great deal of discussion about how companies will organise work inside and outside their offices in the future, how much space they will still need going forward and what this means for our cities. Once the pandemic is over, do we have to expect that half of the offices in the cities will be empty from now on because most employees will continue to work from home?*

Ms. Kröger The great work-from-home experiment in the wake of the pandemic has certainly set in motion some far-reaching changes and, in many cases, accelerated pre-existing trends. But we concluded relatively early on that the central locations in densely populated inner cities will continue to be appealing for office users and professionals. And we are not only talking about megacities like Tokyo, Singapore and New York with population densities of 10,000 people per km^2 or more within a 20 km radius of the city centre, but also large cities in Europe with densities between 3000 and 6500 people like London, Paris and even Berlin.

2. *What makes you so optimistic about this? How do you assess the situation in the short to medium term?*

S. Georgi (✉)
The Urban Land Institute Germany/Austria/Switzerland, Frankfurt am Main, Germany

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Ms. Kröger All of these cities are globally prominent, and benefit from excellent productivity thanks to the direct proximity of skilled workers, capital, science and business. Cities with a high population density are also centres for creativity and culture, setting trends and serving as social hubs that draw people in. This is especially true for young people, who really value living and working in urban city centres and want to be among their peers in a 'live-work-play' environment. And once a social anchor point like this is established, it is very difficult to move it.

In the short term, these effects will certainly be overshadowed by the pandemic and the respective restrictions in cultural, social and economic areas. This situation will probably continue in some form for a while, until a sufficient proportion of the population is vaccinated not only locally, but also globally, so that international travel is possible again. Once this is achieved, however, we expect high-density cities to return to their original dynamism.

3. *Urban centres have always been a point of attraction for creative talent and entrepreneurship. But in your opinion, does this also lead to increasing office demand in the long term?*

Ms. Kröger There are several factors at play:

Firstly, the agglomeration effects in these metropolitan areas lead to a wider range of alternative users that can be found if office space is returned. The higher number of alternative users also means that there are more tenants who stand to be better off by moving from secondary to central locations.

Secondly, in cities with a high population density, more commuters are within a radius with a certain travel time. Lower-density cities have to draw on a much wider catchment area to bring the same number of commuters to city-centre offices.

And thirdly, the tendency to commute to the office is greater in centres with high urban density, as housing is more expensive and flats are therefore smaller. As a result, it is more difficult to accommodate an adequate home office, and the travel time to the office is shorter. For example, if someone lives within 5 km of their office, it takes just 20 minutes by bike to get there. Moving out to the countryside or the suburbs usually does not bring any advantages, as the rent burden does not change much if you rent correspondingly more living space for a home office. What is more, the longer commute deprives people of the very flexibility they value so much.

4. *You have explained why employees will still be happy to travel to central offices in cities with a high population density despite the rise in home offices. But what about the cost of office space? Surely locations of this kind must also be significantly more expensive, providing a real incentive for companies to downsize?*

Ms. Kröger Yes, on the one hand, we have indeed found that the cost of high-quality spaces in premium locations correlates quite strongly with urban density. On the other hand, even before the crisis, office users in densely built-up cities were

facing high pressure to keep their office space as efficient as possible. This has mostly been implemented by moving from a traditional concept of enclosed offices and personal workstations to open-plan offices and desk sharing. Tenants had, therefore, already experienced the process of spatial rationalisation to a large extent before the pandemic began. On the flip side, the traditional office layout usually still prevails in less densely populated cities. This is because the incentive to cut space costs was not as strong here before the crisis.

To validate our theory, we developed models for 35 cities worldwide over last summer and autumn to estimate how long it takes for vacancies in central locations to be fully absorbed. We assumed several shock scenarios regarding the return of office space to the market as a result of home offices and included the respective vacancy rates and long-term forecasts for office employment in the modelling process. The results confirmed that vacancies in central locations refill fairly quickly. If office tenants were to give, for example, 10% of their space back to the market, which for some European cities would more than double the vacancy rate, it would take an average of 3 to 5 years to completely eliminate vacancies in central locations.

5. *But now that companies are feeling huge cost pressure after the worst recession since the Second World War, aren't home offices the ideal way to cut back on expensive office space, especially in city centres?*

Ms. Kröger Of course, companies are looking at the proliferation of home offices as an opportunity to cut costs by reducing space or putting growth plans on hold, and we are already having discussions of this nature with some of our tenants. On the other hand, companies are also aware that they have to compete for young talent and skilled workers.

Last spring, many companies, especially those in the technology sector, announced that most of their employees would be working from home for an extended period of time or even forever. This, of course, caused a real stir and made the headlines. Recently, however, it seems as though people are less enthused by the prospect of working from home. Corporate leaders such as the CEOs of Barclays, Goldman Sachs, Cisco Systems, Google and the Head of Strategy at the Canary Wharf Group have emphasised the importance of collaboration, corporate culture and the integration of new employees in their organisations in recent months.

At the end of the day, labour costs are much more important to companies than occupancy costs. We are looking at a future in which the growth of the working-age population will decline globally. In some countries, the working-age population will even shrink in the next 10 to 15 years. With this in mind, it is essential for employers to attract and retain young as well as experienced talent. This is by far of higher priority than reducing office space or saving on rent.

6. *If human resources are so important for companies, which employee preferences or needs will companies have to adapt to in the future and how or where will employees work?*

Ms. Kröger Working from home in itself is not really the primary concern for employees; they are more interested in the flexibility it brings and the possibility to decide when and where they work. So overall, we are moving towards a hybrid model of working that gives people more freedom in terms of structuring their working time and choosing where they work. This model will involve classic desk work—i.e. tasks that employees do alone and where they have to concentrate, such as coding—taking place primarily at home in the future.

On the other hand, people will prefer to go to the office if they work with colleagues and look for creative solutions together in groups. Employees will also enjoy going to the office to meet their colleagues, exchange ideas and socialise, but it will certainly also be important for employees to socialise outside the office. Maintaining business contacts with other companies or meeting friends outside working hours will become much more important when working alone from home several days a week.

7. *How will the importance of office space change for companies against the backdrop of this hybrid working model and what impact will this have on their demands for office space?*

Ms. Kröger Companies will adapt the size and layout of their office space to the new environment, keeping maximum productivity of their employees in mind. Offices will be important for companies in the future primarily because they offer a place where employees can achieve significantly higher added value through creative teamwork than through conventional desk work. Modern office spaces are one of the most important prerequisites for an increase in productivity of this nature. With this in mind, companies will want to ensure that they can provide an office space which offers the benefits of a good location and an attractive working environment, and also the equipment and functionality employees need for performing their tasks efficiently. This means that company headquarters based in the city centre will actually gain in importance, even if they will play a different role in the future. They will certainly no longer be the place for writing emails or crunching numbers in Excel spreadsheets. Going forward, this will be the place for shaping corporate culture and taking part in social interactions, onboarding and creative teamwork.

In order to accommodate these changes, the future of office design will have to incorporate more space for things like communal areas, coffee bars and meeting rooms. This will probably even reverse the trend towards densification of office space per employee that has been going on for about two decades. The increase in productivity that this will achieve means we do not expect this to have a negative

effect on office rent in the long term. Furthermore, as we have already mentioned, we assume that home-office-related vacancies in central locations of dense cities will be quickly absorbed again. We also expect to see new technologies play an increasingly important role, not only to ensure a seamless transition between working in the office and working remotely, but also to analyse trends in the way spaces are utilised and improve indoor air quality for employees, for example. Technology can also make a major contribution to reducing the energy consumption or carbon emissions of buildings as part of companies' ESG objectives.

All things considered, we expect to see a trend towards much more attractive office spaces that offer companies and employees a sustainable working environment that is not only good for their health, but also ideal for meeting the needs of the new hybrid working world. Even against the backdrop of potentially more intense competition in the office market, we believe that buildings like these will continue to be the front runners in the future.

Sabine Georgi is an Executive Director at the Urban Land Institute for the DACH region (Germany, Austria, Switzerland). The graduate in business administration (BA specialisation in real estate) and Certified Real Estate Investment Analyst has now been working in the real estate industry for 25 years. She worked as a Country Manager at RICS; at ZIA Zentraler Immobilien Ausschuss as a department head for real estate and financial markets and as a consultant. Before that, she advised companies in the housing and real estate industry at the BBT Group consultancy and headed the marketing department. Sabine started her professional career at the Association of Berlin-Brandenburg Housing Companies (BBU) as a consultant to the board. During her studies, she worked for various companies in the real estate industry.

It Is about Responsibility, Technology and Culture

Sabine Georgi

Abstract

In this interview, Sascha Klaus, Chairman of the Board of Berlin Hyp AG (Germany), reports on the experiences made in the Lockdown 2020 for motivating and managing the staff that started working remotely and provides insights into the future direction of the business strategy as well as office space demands.

1. *How did your company react when Germany first went into a sudden lockdown in 2020?*

Mr. Klaus At the beginning of March 2020, when it was starting to look more likely that the infection rates would reach serious levels in Germany, we transitioned almost 90% of our staff to work remotely in just a matter of days. Thanks to our digitalisation programme, which we had embarked on some years ago, most of the staff at Berlin Hyp had already been equipped with mobiles, laptops and VPN access by the spring of 2020 and were occasionally taking advantage of this opportunity for flexible working. Our IT team provided all the others with a laptop and got them up and running in record time. There were just a few places where people needed to be present to keep the bank running. They, like all the other departments as well, were split into strict A and B teams who were prevented from coming into contact with each other in the bank so that we would still be able to operate if we were hit with positive cases. But the majority were given the option to either work from home or from the office. Today, we are very proud of the colossal effort and commitment demonstrated by our staff.

S. Georgi (✉)
The Urban Land Institute Germany/Austria/Switzerland, Frankfurt am Main, Germany

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2. *Are a laptop and VPN access sufficient to operate as a real estate financier?*

Mr. Klaus That is a good question and, yes, it works really well. But it only worked then and still works now because we had already started to digitalise all of the bank's core processes 5 years ago. Of course, it would be impossible without electronic files, a paperless office, Sharepoint and digital approval processes. All the bank's systems and core processes worked perfectly from day one. Operational stability was guaranteed at all times. The bank invested heavily in its IT infrastructure and towards modernising its core processes over the last few years, and this paid off.

3. *But it is not just about the technology—how did the staff cope with the new situation?*

Mr. Klaus Digitalisation has revolutionised how we work and what is required of us. This affects all areas and represents a huge change for everyone. Some people welcome these changes, while others are a little more reserved and feel insecure. Careful reflection is called for here, both individually and collectively, on topics such as self-responsibility, innovation, trust, flexibility, agility, courage and a culture of positive criticism. We also need to keep asking ourselves questions such as: How should we present ourselves as a competent, cooperative real estate financier in a modern digitalised environment? And how do we want to put that into practice in our day-to-day interactions in these pandemic-driven times?

Open dialogue within the company is essential for this. Back when we started this digitalisation process, we implemented a comprehensive cultural change programme that looks at exactly this and drives continuous dialogue. Alongside individual training opportunities, there are also numerous low-threshold information and interaction events. For example when we offered introductory courses on how to use the telephone and video conferencing system "Skype", prior to the pandemic, there was little interest because there was no real need for it. At that time, some people wondered what the point was, but now nobody asks that question anymore. The pandemic has shown us that we can work on a fully digital basis. But it is also true that we all miss social contact and creative interaction in our teams. Innovation and inspiration are derived from working together.

4. *What have you done to keep the team together and motivated?*

Mr. Klaus The first thing we did was to sort out all the necessary health and work organisation issues while keeping our employees informed on a daily basis via the intranet. It was also very important to regularly update the team on the current situation via video messages from the management. At the same time, our internal communications team produced lots of tips and tricks on how to deal with the new situation.

As serious as the context was, it was also important to us not to let interpersonal relations fall by the wayside. We proposed "new lockdown sports" and called for more movement and virtual contact with our "run around the block" campaign. People from different departments formed groups together and kept a record of their runs. They "ran by" (virtually) all our offices in Germany and abroad, starting in Berlin, throughout Germany and then around Paris, Amsterdam and Warsaw. St Nicholas also reached out to them virtually through the internet of course, and our staff received a 2020 Christmas parcel containing punch, biscuits and a "bottle to go" voucher from their local pub. Teams created their own events in addition to their "team meetings", to meet the need for social interaction, such as Skype lunches, "open ear sessions" or "Friday social calls". These ideas were shared via Culture Management, and other digital interaction was also offered.

5. *What was your company's experience with remote management?*

Mr. Klaus These times have been challenging not just for the staff but also for the management team. Most of the staff has coped well with working remotely, independently and in a structured manner. With the lack of personal contact, management needs to be particularly sensitive. Removing the boundaries of location and time brings with it a lot of freedom, but also uncertainties and risks. How do you approach someone? Have mutual expectations been set? Are the legal requirements for working hours being maintained when parents are taking turns with childcare? At the same time, managers also differ widely from one to the next. For some, allowing their teams a high degree of personal responsibility and freedom comes naturally, while others struggle to let go, and not everyone is equally empathetic. They all have their own special needs and challenges to deal with at times like this. For example the HR Department offered training in "remote management", along with appropriate support opportunities and regular interactive sessions for managers.

6. *What effect did the pandemic have on your business model?*

Mr. Klaus We are fortunate in that our business and our results have turned out better than we expected at the beginning/middle of last year. By applying a conservative risk strategy and focusing on financing particularly valuable properties, we achieved a high level of stability. We did not record any defaults on the loan portfolio in 2020 due to the pandemic, and new business development was more positive than initially expected, as was our financial performance, especially given that many decisions were put on hold at the start of the pandemic. Low interest rates and continued high investment pressure created positive conditions for the property market, which is still continuing. However, since this market lags the overall economic trend, we need to keep one eye firmly on the market at all times.

As mentioned at the beginning, our business functioned smoothly from an operational and technical point of view. It is the interpersonal aspect that fell by the wayside. Not just with regard to contact between colleagues, but also with regard to contact with our customers. We developed and set up various digital channels on

an ad hoc basis, so as to keep in contact with our clients. From podcasts, to digital market briefings to livestreams with cheese and wine, just to try to recreate the feeling of a live event and to have a change from the usual "gallery digital meetings", at least once in a while. The crisis unleashed a huge amount of creative potential. And some clouds have silver linings. For example we used to hold media round tables. Now we have opened this up to make them digital and accessible to anyone interested, so it is easy for many more people to take part in our professional events. This increases our transparency and promotes networking. You have to spot the opportunities in the crisis and make the best use of them, so you can then decide what can stay and what we want to change towards a "new normal".

7. *Accordingly, your business strategy proved robust during the crisis. Did you make any adjustments at all? If so, were they long or short-term adjustments?*

Mr. Klaus The long-term and conservative nature of our risk strategy and the structure of our portfolio certainly proved themselves, as did our digitalisation strategy. Our financing had already focused on office and residential properties in the past. COVID-19 meant that the residential property market grew even more strongly. As far as the retail or even hotel segments are concerned, we did not and did not exclude anything per se. In the past, we assessed every project on its individual merits for the future, and we continue to do so today. At the same time, we note the importance of sustainability increasing significantly in the industry and among the public. This is a positive aspect, and not just because we have set ourselves very ambitious sustainability goals.

8. *A new corporate headquarter is currently being built—is this still needed in the form originally planned? Will your office space requirements change in the future?*

Mr. Klaus It is needed just now. We can see that remote working works very well. But we also see what we all miss—colleagues and interaction. For us, the office is, and remains, the cultural anchor point of a company. It is a centre for social encounters and creative collaborations. This is why we also believe the office has a future, both as an asset class and for us as Team Berlin Hyp.

Remote working is certainly here to stay. The future of the office will be hybrid, and this also holds for BerlinHyp. But what will the hybrid "new normal" be like? Definitely different from what it was before the pandemic. Many people have discovered new possibilities in terms of making the workplace more flexible. But at the same time, we also need creative interaction within teams and informal cross-functional encounters in the office.

The offices of tomorrow will be meeting points for teams whose members are working flexibly in a creative team workshop today, in a meeting in the company lounge tomorrow and the day after tomorrow working alone at home. The future office will have a lot of requirements to meet. We currently find ourselves in a very

fortunate situation, in that we can design and adapt our new office in the way we want to. The employees are testing new concepts of working while the new building is being finished, and they are involved in its design using a broad participative approach. Yet, it is no huge surprise that 2 years ago, not many employees could imagine sharing a desk. It is completely different today. The majority of staff want to continue to work on a partially remote basis.

From our point of view, there are no changes to the space requirement at the moment, but layout and design call for a change—fewer traditional office workplaces, and more space for meeting areas instead and conference rooms with appropriate hygiene policies. Our new corporate headquarters need to reflect modern work environments, but we also want to open up to the outside world, for exhibitions for example. We planned this flexibility into the design right from the beginning.

9. *How do you see the situation evolving in the next year?*

Mr. Klaus The current year will certainly remain challenging, especially as we still do not know when we will be able to put the threat of the virus and the pressures it creates behind us. But we are prepared and will benefit from the foundations that we have built, commercially, technically and in our cultural interactions.

As the crisis has acted as a magnifying glass or accelerating force, the challenge can also give rise to special achievements. The philosopher Ibn Khaldun postulated almost 700 years ago, for example that societies make their biggest achievements when the challenges are the greatest. The pandemic has once again taught us that there is something to this way of seeing things.

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The Screen Cannot Replace a Sense of Community

Sabine Georgi

Abstract

In this interview, Dr. Christian Schede, Co-Chair Global Real Estate and Founding Chairman Germany of Greenberg Traurig, highlights COVID-19-related experiences and changes in working environments, as well as the impact on corporate culture and demand for office space.

1. *Greenberg Traurig moved into a new office building in August 2020—"The Westlight" in Berlin-Tiergarten. Planning for this building had already started before the pandemic. Would you have done anything differently from today's perspective?*

Mr. Schede Actually, no. The floorplan for our office dates back to 2017 and meets the requirements for future-oriented working really well. At the same time, the open floor layout allows us to meet the requirements of current social distancing and hygiene measures. In our new office, there are no longer narrow, tight hallways where it is not possible to avoid each other. But that's how it was at our previous location: If you wanted to respect social distancing, you had to use office hallways like a one-way system. Now we have hallways that lead into open teamwork areas at "The Westlight". There are no more narrow spaces and you can move around much more freely and without worry. In addition to small individual offices, there are numerous large team areas that enable meetings between several staff members without them having to sit close to one another. Initially, we had planned the office space for better communication opportunities, but now we realise that we benefit twice as the space conditions are optimal in times of pandemic.

S. Georgi (✉)
The Urban Land Institute Germany/Austria/Switzerland, Frankfurt am Main, Germany

T. Just, F. Plößl (eds.), *European Cities After COVID-19*, Future of Business and Finance, https://doi.org/10.1007/978-3-030-89788-8_19

2. *How is everyday life in the office at the moment?*

Mr. Schede Initially, we tried splitting the staff into different groups working at the office on certain days and otherwise working from home. However, we quickly realised that during the COVID-19 pandemic, this wasn't as easy to plan as we would have liked. In practice, a lot depends on childcare, which is not always provided. Therefore, during the first lockdown, we gave our staff the freedom to work wherever they wanted—but with the clear message to stay at home whenever possible. During this time, the office was occupied by less than half of the staff. But this has changed with the new office. Thanks to new structures and room layouts, we were able to return to an office occupancy rate of around 95% at the beginning. Since the start of the long lockdown in October 2020, about two-thirds of employees stayed at home and one-third were at the office.

3. *How has your own working life changed?*

Mr. Schede I have noticed that my working hours have become more flexible. Instead of only having breakfast with my family, I can be home for dinner more often now. In exchange, I continue to work later. I have more freedom to organise my working hours. Perhaps that is one of the few positive aspects of the past year: for me and many of my colleagues, everyday life has become more family-friendly. And this should definitely continue. From my perspective, it will be much more important in the future to balance working from home and working at the office. This is a learning process that we are currently experiencing.

4. *In the past, many people dreamed of working from home and envied those who could do just that. Has your recent experience changed your opinion about working at the office?*

Mr. Schede In the past year, I think we have learned one thing: the screen cannot replace a sense of community. You certainly don't have to travel across Germany for every meeting or fly to London three times a week to discuss something. Before the pandemic, this was often taken too far and will certainly not occur with the same intensity in the future. But, when it comes to working with the team, it is still crucial to see and be with each other physically. It is much more difficult to create a team situation online than in person: it is easier to pick up on all the moods and develop strategies when you are facing each other and are able to notice when someone has an idea in mind and perhaps just needs a little push to express it. Teamwork between older and younger colleagues as an important part of an integration process, is also more difficult without any physical environment. After all, it is the get-togethers that motivate both sides to communicate with each other and to create—and also live—a corporate law firm culture.

5. *To what extent does the new office space encourage corporate culture and "agile working"?*

Mr. Schede We have adopted the credo of the architect of "The Westlight": Space creates awareness. For us, this is not just an empty phrase. We experienced it when

we moved from a traditional office building into the new modern spaces. Despite COVID-19 and all the corresponding policies, after only a few weeks we all had the impression that we knew each other even better and that we knew more about each other than before. The open spaces, where we meet more often than before; the ad hoc meetings that are now possible; the "GT Forum", a multifunctional event space where we can meet for town hall meetings or lunch together—all this leads to more interaction, strengthens the sense of community and also enhances our work results. In the past, you might not have noticed that a colleague sitting next to you in another room was working on exactly the same problem a couple of weeks ago and that you didn't have to invest valuable time in coming up with a solution yourself. With improved communication options, such inefficiencies can be avoided and even better results achieved. After all, high-quality advice requires networking, interaction and serious discussion. The best place to achieve optimal results together is still in an office with a structure that supports agile teamwork, as it is the case here.

6. *Can you derive a generally valid concept for a modern working environment based on this?*

Mr. Schede Mobility is the keyword for us in this context. We have to become more mobile both physically and mentally. This starts with no longer sitting in one place, in a small office room, for 8 hours a day, but getting up, moving away from your desk and going to other workspaces with other people at least three times a day. You might return to your office room after an hour of team meetings, or perhaps the next meeting will follow right away. You always have your notebook with you, having rapid access to all the data you need is not a problem. In this way, the aggregated knowledge that each individual has available becomes more easily accessible to all.

But part of the modern working environment is also to abolish rigid rules. In future, "one-size-fits-all" will be replaced by team-compatible, individual agreements. Fixed working hours are also a thing of the past. "Facetime" is no longer crucial. No one expects to be present for the sake of being present. This will also catch on in other companies and industries—as long as they have office jobs that are not subject to public traffic. For us, it's the result that matters. Mobile working on certain days or—in the case of lawyers—even in the evening does not require any special justification. What is important is team compatibility and fairness, but also that our clients feel well taken care of. We achieve this by means of responsible and at the same time open coordination in our respective teams.

Sabine Georgi is an Executive Director at the Urban Land Institute for the DACH region (Germany, Austria, Switzerland). The graduate in business administration (BA specialisation in real estate) and Certified Real Estate Investment Analyst has now been working in the real estate industry for 25 years. She worked as a Country Manager at RICS; at ZIA Zentraler Immobilien Ausschuss as a department head for real estate and financial markets and as a consultant. Before that, she advised companies in the housing and real estate industry at the BBT Group consultancy and headed the marketing department. Sabine started her professional career at the Association of Berlin-Brandenburg Housing Companies (BBU) as a consultant to the board. During her studies, she worked for various companies in the real estate industry.

Part V

Implications for Retail and Logistics: Cities to Supply

Consumer Cities under Pressure to Change

Tobias Just and Franziska Plößl

Abstract

The results of a Europe-wide survey of real estate market players indicate that, since the COVID-19 pandemic, noticeable and permanent declines in demand are expected for the retail space due to increased competitive pressure from online providers. Grocery retailers, specialist market centres and discounters are largely exempt from this pressure to adapt. From the respondents' standpoint, brick-and-mortar retail must focus more on the triad of experience, social interaction and gastronomy moving forward. Forecast for logistics space in all regions has grown exponentially during the pandemic. Cities thus face a double and concurrent challenge: managing the surplus space for retail and the shortage of logistics space.

1 Introduction

Further to the accommodation and events sectors, physical retail and gastronomy were among the hardest-hit industries during the COVID-19 pandemic (Ehrentraut et al., 2020; Goecke & Rusche, 2020; ifo Institut, 2021). Google mobility reports (2021) attest to this fact: during the first wave in spring 2020, mobility behaviour in shopping centres, amusement parks, cafés, museums and cinemas collapsed by 60% (Berlin) to over 90% (Paris, Madrid or Milan). To date, this figure has not recovered the reference level of February 2020 in any of the cities shown in Fig. 1. Only for

T. Just · F. Plößl (✉)
IRE|BS International Real Estate Business School, University of Regensburg, Regensburg, Germany
e-mail: tobias.just@irebs.de; franziska.ploessl@irebs.de

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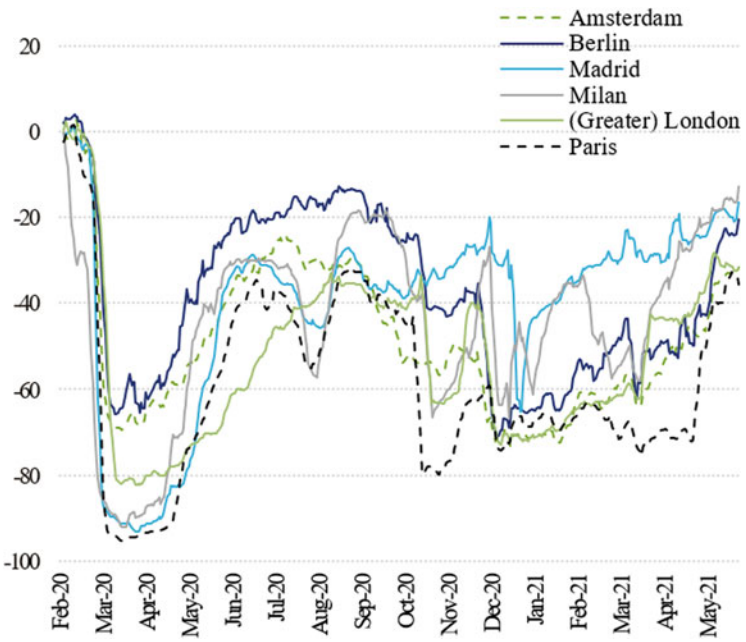

Fig. 1 Mobility behaviour in retail/leisure, in % vs. smoothed baseline. Source: Google (2021)

shops of consumer goods, i.e. supermarkets, drugstores or pharmacies, could 2020 and 2021 show similarly high activity values—in some cases even higher values than before the crisis.

The mobility behaviour in residential buildings is almost an upside down reflection (see Fig. 2). Usual life has been turned upside down, and this mobility comparison probably does not even do justice to the intensity of the change, because February was chosen as the reference point—in February, shopping is more targeted and strolling is subject to less favourable weather conditions than, for example, in the summer months.

The physical retail sector suffered a severe drop in sales. In the first lockdown phase, European retail sales collapsed by 20%; in non-food segments, declines attained in some cases almost 50%—with netted online sales (Eurostat, 2021). By the spring of 2021, the entire retail turnover had almost recovered to the pre-crisis level. This fact, however, conceals massive shifts within the retail segments: while online retail in Europe increased by over 40% (see Fig. 3 for Germany) in the wake of the pandemic, department stores are still recording almost 15% lower sales than before the crisis (Eurostat, 2021).

The effects on the European physical retail trade are likely to be even more serious than these rates of change suggest. Firstly, the retail sector in many places already suffered from online competition before the pandemic as well as from the high-margin pressure within a very competitive industry. Secondly, the lack of

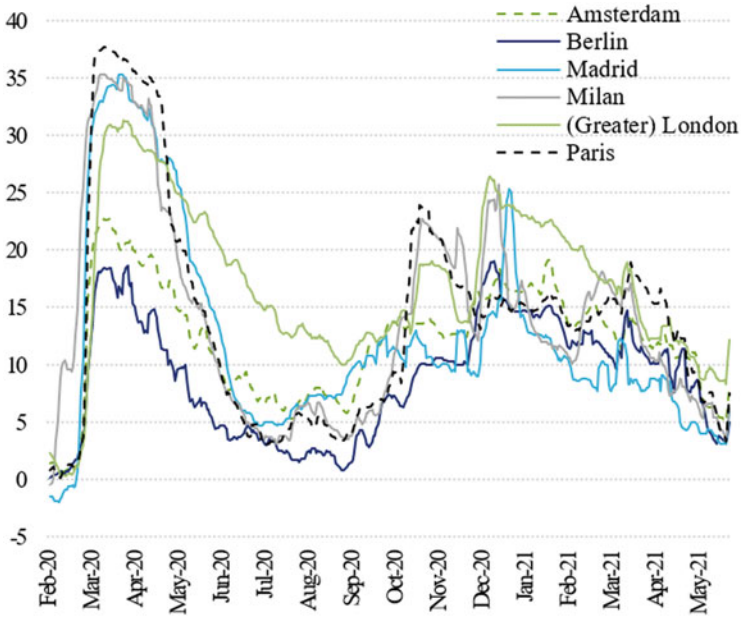

Fig. 2 Mobility behaviour in residential buildings, in % vs. smoothed baseline. Source: Google (2021)

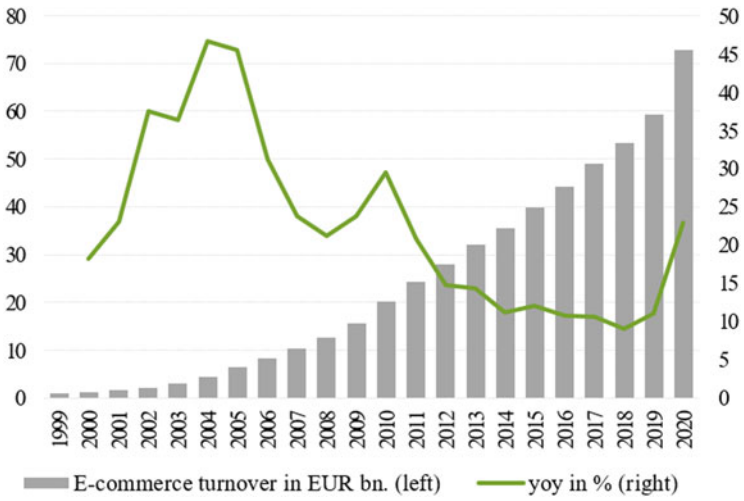

Fig. 3 E-commerce turnover in Germany. Source: HDE (2021)

alternatives during the lockdown phases of those population groups in online consumption who had previously held back, especially many older people. This created trend dependencies that would otherwise have had a much slower start.

This accelerated shift within consumption structures, conversely, favoured logistics areas, because population's supply had to be guaranteed. This barely affected industrial logistics or logistics for consumer goods, which often made the headlines, but this shift hit last-mile logistics that online retailing requires (Banker, 2020; Seghezzi et al., 2020; Srinivas & Marathe, 2021).[1]

2 Retail

Survey participants,[2] therefore, do not expect the burden of retail adjustment to be overcome with the end of the pandemic. Only a minority (approx. 15% of participants across all location types) expects demand for space to grow over the next ten years. Around two thirds of participants expect further declines in demand for space (see Fig. 4). Moreover, differences between individual regions are not very significant. Although there are more participants who expect very strong declines in demand for space in rural areas, the difference can be neglected when combining both shrinkage categories. If we also factor in that the pressure to consolidate in rural areas has already been extreme in recent decades, and that inner-city properties have so far been significantly more important for investors, the largest—both absolute and relative—adjustment burden for retail investors and users is likely to be in metropolitan areas. This is also evident from the free-text answers of survey participants: of a total of 327 answers given on the "normality" of retail real estate after the pandemic, 64 unprompted answers refer to the pressure to consolidate. Now, the extent to which this leads to a loss of attractiveness seems to be a matter of dispute: answers include both concerns about "urban desolation" and the all-clear that "inner cities will not be deserted", or only if "planning errors" were to be made.

According to the opinion of survey participants, retail segments that averted closing during the pandemic, i.e. food retailers, retail parks and discounters (see Fig. 5) are exempt from this consolidation pressure. Here, too, investors would have to rethink the future, because their key investment targets have been shopping centres, retail properties in shopping streets and department stores for decades. These three categories were already considered structurally burdened before—a burden that only grew during—the pandemic.

[1] In supply chain management, the last mile describes the transport of a good from a transport hub to the destination.

[2] Together with the Product Councils of ULI Germany, an extensive questionnaire was drawn up in German and English, which was answered by a total of 421 participants in Europe in March and April 2021.

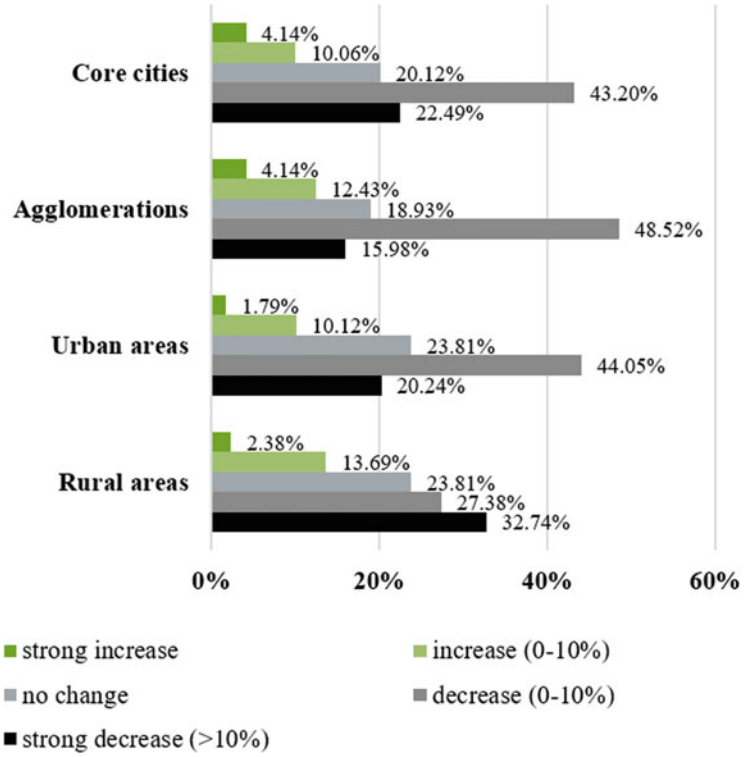

Fig. 4 Outlook for retail space demand over 10 years. Notes: Own data collection on the question "Please estimate the demand for retail space in the following regions for the next 10 years"; 6.11%/6.11%/6.66%/6.66% of the participants in the survey on the retail asset class did not provide any information; definitions according to the Federal Institute for Building, Urban and Spatial Research (BBSR): agglomerations—regional centre over 300,000 inhabitants, urban areas—regional centre over 100,000 inhabitants, rural areas—without regional centre over 100,000 inhabitants

A similar, ultimately related structural shift can be seen in the frequency anchors of retail trade: while textile retail trade and electrical goods ranges are likely to lose importance in the long term, food is literally becoming a frequency anchor (see Fig. 6).

For the future, survey participants expect the retail sector to place a major focus on the triad of experience, social interaction and gastronomy (see Fig. 7). In these areas, physical retail trade has permanent advantages over Internet trade, even if many smaller physical retailers will be left behind in the price and range competition. Variety is particularly important for the experience because it guarantees a high enough frequency. Variety requires innovation, creativity and human interaction. This could result in shorter contract terms, smaller average surfaces, and the flexibility could also be reflected in the (rental) contract design.

Fig. 5 Preferred forms of operation. Notes: Own data collection on the question "Which types of retail properties are preferred by investors after the pandemic?"; multiple choices possible; 6.11% of the participants in the survey on the retail asset class did not provide any information; most frequent mentions for other: mixed-use

In free-text responses to the survey, 47 respondents emphasised that physical retail must become more service-oriented and strengthen social aspects. This would result in more personalised approach. Even more survey participants (61 responses) underlined that there must be closer interlinking between the online and offline trading worlds.

In this respect, the future of physical retail lies in cost-intensive services, an equally cost-intensive presentation of goods and/or the creation of partially cross-subsidised experiences. Moreover, the development of a digital strategy initially implies redundancies and, therefore, costs. The connection with digital aspects (Click and Collect) or simplified payment systems are recognised as important, albeit they are not as critical for the success of physical retail as haptic changes to the presentation of goods and the shopping experience.

The logical consequence of these developments is likely to be further polarisation: online retailing will capture additional market share wherever the range price and depth are the key competitive parameters, whereas physical retailing can remain successful wherever adequate margins and thus attractive experiences can be offered. Even if transaction costs could be lowered, for example, through longer opening times or shorter queues at cash registers, physical retail could become more competitive through automation. Because customers bear the costs for the last mile themselves and increasing automation could support longer opening times.

For retail, the opportunity lies precisely where customers voluntarily take on last-mile logistics and thus give retail a cost advantage. However, customers will only do this if provided with a major incentive to visit physical stores. Accordingly, typical retail products are becoming more of a by-product for services that customers

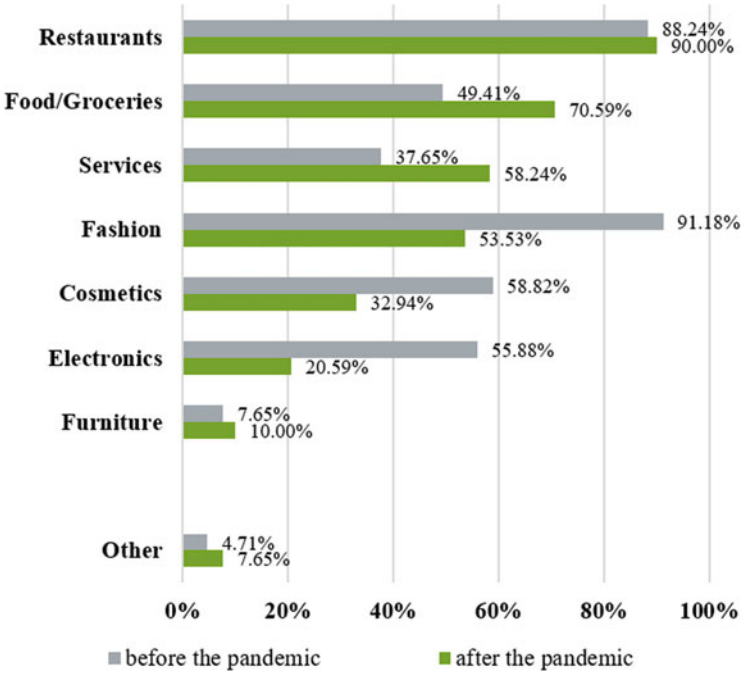

Fig. 6 Frequency anchors in city centres. Notes: Own data collection on the question "Which industries represented/represent the frequency anchors in city centres?"; multiple choices possible; 5.55% of participants in the survey on the retail asset class did not provide any information; most frequent mentions for other before the pandemic: book stores, department stores; most frequent mentions for other after the pandemic: book trade, leisure and sporting goods, productive trade

cannot, or can only insufficiently find on the Internet. This changes the settlement logic in retail. For this to work, however, increased attention must be paid to the creative side of things, where typical frequency anchors change.

For smaller retailers in particular, this could lead to stronger cooperation, as seen in the Business Improvement Districts of Hamburg,[3] or to even closer collaboration, such as that proposed by Dascher and Daminger (2018) whereby the advantages of central planning, coordination and bargaining power can be achieved through cooperation between several businesses.

3 Logistics Becomes a New Core Segment

The European logistics real estate industry, both users and investors, has experienced a strong, positive impetus through the pandemic. Although there were initially numerous hindrances to international trade in goods, especially in the case of imports

[3] See https://www.hamburg.de/bid-projekte/

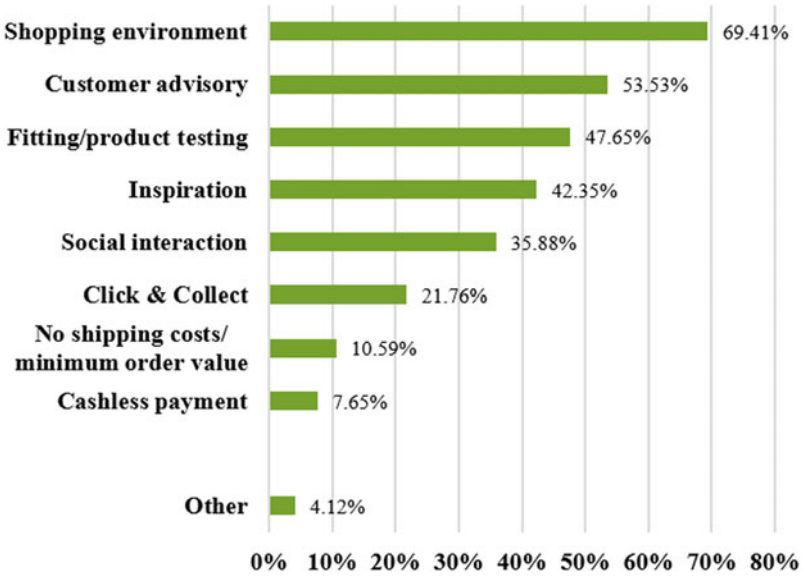

Fig. 7 Important aspects for physical retail. Notes: Own data collection on the question "Please select up to three aspects that are particularly important for physical retail after the pandemic"; multiple choices possible; 5.55% of participants in the survey on the retail asset class did not provide any information; most frequent mentions for other: storage for instant delivery, location, multi-channel distribution

of wholesale products (Destatis, 2021), this initial shock was—despite initial concerns—significantly smaller than during the financial and economic crisis. This might be precisely because the pace of globalisation has already slowed down in the past 10 years—at least regarding the goods trade that is relevant here (Felbermayr & Görg, 2020).

Survey participants expect sustained growth in demand for space over the next 10 years—across all types of locations (see Fig. 8). In contrast to the retail sector, there is clear distinction here: agglomerations seem to benefit most from extended surfaces whereas rural areas only do so moderately. This is also evident in the free-text answers. Out of a total of 192 answers, 54 relate to the topic of "growth" (further ten deal with "stability"). The second most frequent answer (a total of 27 mentions) concerns the "last mile" category, followed by "online/digital trade" with 22 mentions, which is at least very closely related to conquering the last mile. This underlines the perspective for inner-city physical retail, which mostly goes beyond basic supply and focuses more on creating an atmospheric experience, while supply ranges through direct online consumption are becoming more of a logistical than a retail issue. In the opinion of survey participants, residential use will also result in more spillover effects for logistics use in the future, while retail will lose somewhat its relevance.

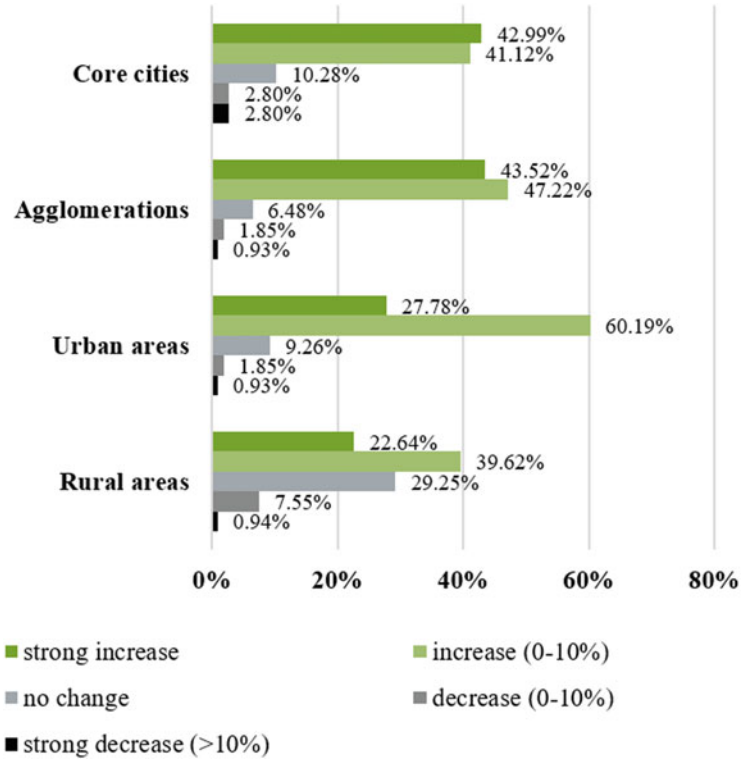

Fig. 8 Outlook for logistics space demand over 10 years. Notes: Own data collection on the question "Please estimate the demand for logistics space in the following regions for the next 10 years"; 1.83%/0.92%/0.92%/2.72% of participants in the survey on the logistics asset class did not provide any information; definitions according to the BBSR: agglomerations—regional centre over 300,000 inhabitants, urban areas—regional centre over 100,000 inhabitants, rural areas—without regional centre over 100,000 inhabitants

Although there is a slight difference between the expectations of inner-city logistics development according to the age cohort of survey participants (younger participants are more likely to expect further increases than older participants do), these differences are not very pronounced (see Fig. 9). This might indicate that the pandemic has helped in opening older people to online consumption. The transition to a hybrid consumer world was accelerated by the pandemic. It was previously argued that this process will only gradually take place over many years through a cohort transition from (older) consumers—who predominantly shop at physical stores—to (younger) consumers, who favour the online shopping experience (Just, 2012).

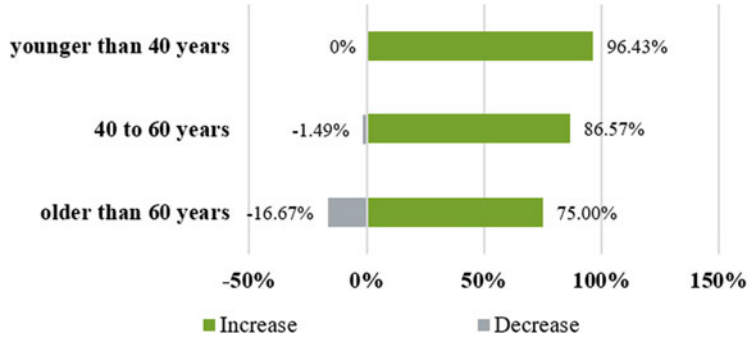

Fig. 9 Inner-city logistics by age. Notes: Own calculations; there is a medium correlation between respondents' age and the expected demand for logistics space in urban areas; Chi-square test, $\alpha = 0.1$; χ^2 $p = 0.023$; Cramer's $V = 0.2307$

4 Final Remarks

Overall, the pandemic is exacerbating the structural problems of many retailers and retail formats. It is not so much that there is further consolidation in physical retail, but rather the force this phenomenon acquired in 2020 and 2021; above all, the general impact of the cascade of lockdowns on stable and less stable formats alike. In this respect, the fear of "dying inner cities" is certainly unjustified in this diction. Still, the "dying *within* the inner cities (of retailers)" is possibly inevitable and the real problem arises from the "dying of actual viable formats". However, it is not easy to clearly identify this in advance—and seems hardly feasible based on the range alone. Because of this, and given that the rapidly increasing vacancy rates of abandoning companies can trigger negative externalities in the form of reduced quality of stay for healthy companies and the cities as a whole, it would be understandable if the necessary adjustment process was moderated by public and private support (see chapter "The Preservation of Economic Structures as a Main Challenge of Urban Development"—Oberst, 2021).

But medium-term perspectives are more important: firstly, the redevelopment of the city centre, secondly, the restructuring of inner-city retail, and thirdly, the integration of more usage classes into the districts, which can also favour retail uses. The latter would have positive effects on urban retail compared to online retail, but not on inner-city retail. There is thus a conflict of goals here, and municipalities are faced with the challenge that every form of the 15-minute city weakens its core a little. Therefore, as with other city-wide offers, it is important that, further to strengthening districts, the central functions of the city centre are retained, i.e. that a division of labour remains between locations. A perfect 15-minute city is ultimately only an approximation of a meaningful implementation. On the one hand, certain services are being shifted from the city centre to the districts, which increases the frequency of district residents in such neighbourhoods. On the other hand, the

inner city must be strengthened by additional residents, i.e. to a certain extent become a district itself, and retain central inner-city functions so that there are no redundancies for those functions that need only be used sporadically.

The hope that logistics companies can absorb any vacant retail space probably only works in Excel spreadsheets. Space requirements for logistics and retail space are simply too far apart for such offsetting to happen very often, especially because many small retailers are likely to give up. It is, therefore, to be expected that the surplus of space in retail will be offset by a shortage of space for inner-city logistics for many years.

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Tobias Just is a Managing Director at the IRE|BS Immobilienakademie and professor of Real Estate at the University of Regensburg. Tobias studied economics in Hamburg and Uppsala (Sweden). In 1997, he started to work at the University of the Federal Armed Forces Hamburg. His PhD dissertation was awarded the university science prize in 2001. For more than 10 years, Tobias worked at Deutsche Bank Research. He headed the unit's sector and real estate team and was a member of Deutsche Bank's group-wide Environmental Steering Committee. In 2006, Tobias was a Research Fellow at the American Institute of Contemporary German Studies at the Johns Hopkins University. Tobias published more than 200 papers in professional and academic journals and books. Until 2021 he was President of the German Society of Property Researchers and is the editor of the ZIÖ—the German Journal of Real Estate Research. In 2018, Tobias became a Fellow of the RICS by nomination.

Franziska Plößl is a Research Assistant and doctoral candidate at the International Real Estate Business School/University of Regensburg. Franziska studied Real Estate Business (MSc) at the University of Regensburg and International Real Estate (MSc) at Florida International University, graduating at the best of her class. She has published on various topics, including CREM, nursing homes, and megatrends, in the real estate industry.

The Importance of the Food Retail Industry for Cities after COVID-19

Sabine Georgi

Abstract

In this interview, Dr. Angelus Bernreuther, Head of Investor Relationship Management Kaufland (Germany), describes the implications of the COVID-19 pandemic for inner-city retail locations as well as the food retail sector in its role as supplier, and discusses new approaches and concepts for the retail industry.

1. *The pandemic is affecting individual sectors differently. What is your perspective as a food retailer?*

Mr. Bernreuther A lot has changed as a result of the pandemic. The retail industry has always been characteristic of our urban structures. And in the future? There is no easy answer to that.

First of all, COVID-19 has changed many patterns of behaviour. But it is important to distinguish between short-term measures and long-term trends. COVID-19 has pushed back some long-term trends temporarily but accelerated others. Due to social distancing, there are new behaviours along with megatrends such as sustainability, urbanisation, mobility and digitalisation, including home shopping inevitably. This topic in particular was already a concern for the retail industry and the individual sectors before the pandemic. Since the pandemic, many non-food segments such as fashion have had to face even more pressure, especially due to stores closed during the lockdowns. The share of online retailing has inevitably increased during this period. However, the situation is quite different for local supply. Despite the undeniable increase of online retailing, future market shares will remain predominantly stationary. At most, online retailing might be more important in metropolitan areas. For individual retail locations, above all in our city centres and the traditional, large shopping centres, this means a major adjustment. Many

S. Georgi (✉)
The Urban Land Institute Germany/Austria/Switzerland, Frankfurt am Main, Germany

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municipalities, investors and developers are questioning which stores will be a future anchor for the individual locations.

2. *Will there be a change in the retail landscape of our cities, and with it the appearance of our cities?*

Mr. Bernreuther Of course our retail landscape will change. But we are convinced that retail will continue to play an important role in cities. There is a significantly higher need for revitalisation, especially in traditional locations such as our city centres, district centres and also in larger shopping centres, but not all retail properties will be affected in the same way. For inner-city properties such as department stores, a different use should be considered, at least for the upper floors. Shopping centres that are very fashion-oriented will have to rethink their mix of uses in order to achieve new added value. Retail properties must be more flexible in their types of use; many properties have already been redeveloped in the past. There are certainly opportunities for our cities, for example, to overcome monotony and move towards more mixed-use retail, also with new integrated concepts such as restaurants, services, residential, office and hotels. This has always been the main idea of the European city. Local supply can contribute to this, especially in areas where it has not been possible in the past, due to lack of space and lower rents for grocery stores, e.g. in city centre locations. There are new opportunities for locating to these areas.

3. *For some time now, mixed-use properties and even new neighbourhood concepts have been discussed increasingly in the context of denser construction. What is your opinion as a retailer?*

Mr. Bernreuther Mixed-use is certainly one of the concepts for many properties and neighbourhoods of the future. It is a logical consequence, given the long-term framework. However, there is no one-size-fits-all solution. Every location must be considered afresh with local creativity. In this respect, it is important to combine types of use in a way that create spillover effects. For example, synergies between a grocery store and a hotel can be leveraged by the occupation of parking lots of restaurants or cafés. Conflicts of use, for example, concerning noise emissions for residential and retail, should be reduced to a minimum. Flexible construction has always been a common practice for us as a retailer. Of course, there are stand-alone locations at ground level; these will also remain in the future. But there are also space-efficient solutions with parking lots at ground level and the sales area above them. For further solutions on the upper floors, flexibility will be needed as to whether residential, office, sports facilities or other uses are most appropriate (see Fig. 1). It all comes down to the most suitable solution for the specific location in the long term.

4. *So there is no blueprint for this path?*

Mr. Bernreuther No, there certainly isn't. It depends on the specific location. Furthermore, the different segments will have to be analysed individually and

Fig. 1 Mixed-use including sports facility in Erfurt. Source: Kaufland/Tom Bauer

probably re-evaluated after the pandemic. Let's take the relationship of local supply and city centres: food retailing in particular can play a new role here. It is important that each retail segment is understood with its characteristics. Let's take a simple example: unlike fashion retail, the food retail sector usually does not depend as much on pedestrian footfall but rather on an originary catchment area. For city centres, it is, therefore, either a matter of locating smaller, often convenience-oriented suppliers, or larger food stores as anchors for the whole area or even city. However, development, delivery and parking must be ensured. Our mobility will certainly change as well. But at best in metropolitan areas, food retailing in such locations can rely on walk-in customers, i.e. customers with a significantly lower average purchase. However, all-out focusing on a customer group that is often just passing by in small areas results in a reduced product range, which is then offered to a larger extent online.

5. *Does this imply that adapted strategies are required according to the size of the city?*

Mr. Bernreuther Absolutely. In general, and especially for all the polycentric countries, this means from the perspective of food retailing: the smaller the city, the greater the importance of local supply as an anchor. Many segments, especially the non-food segment, will no longer be able to be positioned in small and medium-sized towns, at least not nationwide and with their former importance. The development of online retailing is simply too strong for these market segments. Therefore, local supply is becoming all the more a central place and also a social meeting point. Other important shops also benefit from the regular footfall: bakers,

butchers, lottery shops, cleaning services and restaurants/cafés. A comprehensive shopping experience adapted to the size of the city will be crucial. Incidentally, this also applies to our district centres and secondary locations in the larger cities. The aforementioned mixed-use will also find more and more viable uses in the long term, but not in every size of city.

6. *Digitalisation will have an even stronger effect on our cities. Does this also result in opportunities for the food retail sector?*

Mr. Bernreuther Digitalisation is one of the megatrends and the pandemic has highlighted this in its complexity. Digitalisation offers a variety of new sales and communication channels. It is important to combine these more strongly, especially in the context of stationary retail locations. Customers will go to a shop if they are attracted by the shopping experience, or if they need to buy something quickly. In Germany, 93% of the population can reach a grocery store within a five-minute drive. Part of the reason why this industry is online-resistant in this pandemic is the area-wide spread of the shops, despite all the current online activities. However, online delivery services are also currently growing, although starting from a very low level. Taking a closer look, up to now just in a few metropolitan areas. This is mainly due to the challenging logistics, especially when dealing with fresh food. The last mile can, therefore, only be provided in these areas, if at all, close to covering the costs of logistics. In a polycentric country like Germany, with a high proportion of rural areas and strong small and medium-sized towns, area-wide online delivery services are difficult to envision.

7. *Is local supply therefore becoming the most important anchor for our cities?*

Mr. Bernreuther Local supply will continue to play an important role in retail locations. However, not every location, city centre or shopping centre, can be preserved by local supply only. Nevertheless, these locations offer new opportunities, e.g. to create new anchors in food retailing, if the corresponding pedestrian footfall and an originary catchment area are given. Especially for smaller communities and district centres, local supply generates the important regular footfall. It is even more clear for the locations of retail parks: without local supply, there will be no well-positioned location. Local supply is thus an essential factor in the retail mix.

8. *Is food retail becoming more attractive to investors due to its function as a supplier?*

Mr. Bernreuther Without any doubt. The pandemic has shown in particular that food retail creates significant underlying footfall, and is even structurally relevant. The reason for this is also that every citizen spends on average more than half of their disposable income on retail, on local supply. Combined with the high resilience of online retailing, this is certainly one of the main reasons why food retailing is currently very attractive to investors. The food retail sector and food-anchored properties such as retail parks, but also mixed-use properties, are therefore increasingly considered to be the so-called core investment objects.

9. *Does this mean that new concepts of planning and cooperation are required for our cities?*

Fig. 2 Urban concepts of grocery stores. Source: Kaufland

Mr. Bernreuther All our planning and control tools date back to the time before the pandemic. For retail, this means above all that the regulations on retail projects must be reconsidered. The classification of what is considered a central supply area, how it is zoned and what function it should have must also be adjusted. Locations must be evaluated with a new realism. Purely "protecting for the sake of protecting" does not preserve viable market structures but strengthens online retail rather than weakening it. Retailers without the willingness or ability to change will not survive if new concepts are not yet available in an adequate quantity. As a large food retail company, we are willing to determine the best solution for the specific location, in discourse with all groups involved in urban development (see Fig. 2).

Sabine Georgi is an Executive Director at the Urban Land Institute for the DACH region (Germany, Austria, Switzerland). The graduate in business administration (BA specialisation in real estate) and Certified Real Estate Investment Analyst has now been working in the real estate industry for 25 years. She worked as a Country Manager at RICS; at ZIA Zentraler Immobilien Ausschuss as a department head for real estate and financial markets and as a consultant. Before that, she advised companies in the housing and real estate industry at the BBT Group consultancy and headed the marketing department. Sabine started her professional career at the Association of Berlin-Brandenburg Housing Companies (BBU) as a consultant to the board. During her studies, she worked for various companies in the real estate industry.

The Future of Urban Logistics

Sabine Georgi

Abstract

In the interview with Mathias Leidgeb, Managing Partner of Palmira Capital Partners (Germany), the development of the logistics industry and real estate in the wake of the COVID-19 pandemic is described and how the supply of cities will change in the future. The shifts in conventional and online retail are of crucial importance.

1. *Is logistics as an asset class considered a winner of the COVID-19 crisis?*

Mr. Leidgeb In its role as a logistical lifeline to the entire economy, the logistics sector is a resilient industry. It, therefore, goes without saying that logistics companies have sufficient experience of both positive and negative developments in all industries. The booming expansion of online trade is certainly one for the plus column, but of course this goes hand in hand with a decline in brick-and-mortar retail, which doesn't bode well for logistics either.

At the same time, the pandemic disrupted major supply chains and ultimately slowed down the logistics industry. But it would seem that the race is now on to catch up again—especially in sea freight, driven by the rapid recovery of the economy in some cases, and in China in particular.

2. *How is the pandemic influencing both online and conventional retail?*

Mr. Leidgeb Retail turnover has increased nominally by less than 1% p.a. for almost 20 years; however, the share of online trade has increased rapidly at the same time and is still increasing.

S. Georgi (✉)
The Urban Land Institute Germany/Austria/Switzerland, Frankfurt am Main, Germany

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Nevertheless, retailers have continued to expand their physical retail spaces during these years of low growth, and these contrary developments are critical. According to a recent study by the Institute for Retail Research,[1] COVID-19 is accelerating structural change and up to 80,000 retailers could disappear from the market.

3. *How will cities change from a logistical perspective post-COVID-19?*

Mr. Leidgeb The way we see it, cities will have to respond to the growing needs of online delivery more than ever before, and we will also see massive advancement in terms of the ecological transformation of our cities post-COVID-19.

To prepare for the growth of online trade, cities should promote structural solutions for last-mile concepts[2] in peripheral locations and no longer ban delivery drivers from the city centre, especially since, according to a traffic study in Vienna, delivery vehicles only constitute 0.8% of the total traffic (Kummer et al., 2019). Infrastructure is financed by taxpayers' money, meaning it is also available for online trade and online customers. Short-term parking zones should be established along the junctions for dense residential areas, with pick-up points created around the neighbourhood.

Cities also need to become more 'online friendly' through concepts such as city apps. The more accessible these concepts make utility services, the more likely they are to be used. This also includes shopping apps, which allow local retailers to showcase and sell their products. Goods can be reserved or delivered to customers in an ecologically sustainable way by means of bicycle delivery services, which are usually only busy with food deliveries in the evenings anyway. More and more high-street locations are also having to reduce their high rent levels as they are proving too difficult to let, and this is opening up new opportunities for smaller retailers—as well as bars and cafés—to bring back the 'enjoyment factor' to city centres.

For the increasing number of cyclists and also the growing number of bicycle delivery drivers, especially during the crisis, more bicycle lanes should be designated in a bid to encourage people away from private transport. We need to address the priorities in cities so that delivery traffic (especially for essential goods like medical products), bicycles and public transport will be prioritised over motorised private transport going forward. 40% of commuters have a commute of

[1] Under the title 'Handel in Coronazeiten—Status quo und Perspektiven' [Retail in Covid Times—Status Quo and Prospects], Werner Reinartz, University of Cologne, and the IFH Cologne have compiled relevant figures on the market, competition and consumer behaviour in relation to the retail of the future. The newly calculated data on retail development under the influence of the current pandemic is based on the calculations of the IFH experts for the 'Retail Scenario 2030' project and was updated using proven IFH methodology based on the IFH industry information system.

[2] In supply chain management, the last-mile concept describes the transport of goods from a transport hub to its destination.

less than 3 km and could easily switch to public transport or cycling. Above all, public transport should be massively expanded and become the main affordable means of transport. This would ease the current competitive situation between delivery traffic and private transport while also introducing ecological advantages.

4. *How will the pandemic affect cities and last-mile logistics?*

Mr. Leidgeb The pandemic has brought about the accelerated decline of many urban retail locations, with regional centres in particular bearing the brunt. The existence of large, fragmented stores, the dreariness of city centres and the monotony of the products on offer in the same old retail chains have made their impact felt in many areas long before the pandemic took hold.

The food retail industry, however, seems to have escaped unscathed: The high number of grocery shops caused by an obviously consistent shopping behaviour of consumers, not to mention the price sensitivity of German consumers in particular, means that food retailing is proving to be stable in times of COVID-19.

The fact that last-mile or dual concepts of online retailers complement brick-and-mortar retail is unquestionable; however, we consider it impossible that this alone could revive the traditional retail experience: At present, logistics companies already have to deliver three—and, in the near future, four—billion parcels per year in Germany. With this in mind, we do not see how the largely inefficient intralogistics[3] processes in often overpriced department stores could really be appropriate here. Last-mile logistics, on the other hand, is proving its worth in highly efficient cross-docking[4] processes in peripheral conurbation areas.

5. *Winners and losers of the crisis are emerging: Online trade and pharmaceutical logistics, for example, are booming, while mechanical engineering and the automotive industry are falling by the wayside. What does this mean for developers, owners and investors?*

Mr. Leidgeb For us, the picture is not so clear cut: On the one hand, online trade suffered from interrupted supply chains, just like the pharmaceutical industry. On the other hand, however, positive developments are surprising in some cases: The automotive sector, for example, is currently recovering, as is the mechanical engineering sector, thanks precisely to strong demand from the major sales markets of China and the United States, which are recovering more quickly.

That said, there is a threat of a long-term shift in market share in favour of the USA, China and South-East Asia, which are capable of faster growth in world

[3] Intralogistics describes the transport of goods within the warehouse or company premises.

[4] Cross-docking is a type of goods handling process that pursues the goal of handling goods directly and sending them on to the customer rather than storing them.

markets as a result of uniform and consistent COVID-19 measures and high vaccination rates. European ports and airports, for example, not to mention many production locations, could continue to lose significance for the global economy.

6. *Some companies want to increase their buffer and storage capacities to be more independent of foreign suppliers—for example, from China. Will the industry now build more warehouses in Germany?*

Mr. Leidgeb Industries become more independent of supply chains outside the European Union through nearshoring[5] or buffering, both of which are expensive. As markets also continue to compete, the scope for these costly buffering measures remains limited. From our point of view, it follows that both nearshoring and buffering will only take place if there are no other economically feasible options or if it is required by law. There won't be this 'reversal of globalisation', as the WELT wrote in April 2020 (Stocker, 2020).

7. *Are logistics properties becoming more popular with investors due to their systemic relevance and utility function in the wake of the COVID-19 crisis?*

Mr. Leidgeb Logistics properties have been popular and long-since considered institutional investment properties in the United States and the United Kingdom since the 1980s, and this development also started to take hold in Germany about 10 years ago. The delayed perception of this asset class is all the more astonishing as the German logistics sector represents the largest economic sector in Germany with an employment figure of around three million and growth at an overproportionate rate (Listenchampion, 2020).

A further increase in the popularity of logistics property during the COVID-19 crisis can be attributed to two aspects.

Firstly, the logistics sector itself has impressively demonstrated its importance for supplying Germany with goods from around the world, even during the crisis, thus disproving the long-held misconception that logistics can only work well as long as the economy is functioning as it should. The subject of logistics is becoming even more important during the crisis. Going forward, the greatest growth potential for the logistics industry lies in taking over logistics for global industrial companies more cheaply (than in-house) and also more effectively. This makes the tenants of logistics properties very resistant to crises.

The second aspect for the rising popularity of logistics property lies in its particular importance for the growing online trade, which accounts for approx. 25% of logistics services and continues to increase during the COVID-19 crisis. These last-mile properties are located in peripheral locations on commuter belts and laid out exclusively to ensure the rapid redistribution of goods so that they can be

[5] Nearshoring is a special form of offshoring that describes the relocation of operational activities to nearby foreign countries.

dispatched to consumers effectively on a 'day-to-day' or 'next-day' basis. At the same time, there is a growing demand for standard logistics properties to provide buffer storage for online retailers in convenient locations throughout Germany.

8. *What trends will shape the logistics property market in the future and what does this mean for the individual market players?*

Mr. Leidgeb Digitalisation will enable new concepts for logistics property; blockchain technologies will secure the transport of goods, for one thing, and new sorter and storage systems will increase the efficiency of logistics space and help to mitigate the continued high demand for new space. On the other hand, mixed uses, such as office and even residential with logistics and last-mile, will complement the range of pure logistics properties in expensive conurbation locations going forward.

Furthermore, 'greening' will shape the development of logistics properties, as logistics and industrial properties are more likely to be carbon-neutral than other asset classes. The transformations required for this are primarily carried out by means of carbon offsetting in the form of solar energy and its on-site storage, geothermal energy and, of course, through CO_2 savings by optimising building systems.

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Sabine Georgi is an Executive Director at the Urban Land Institute for the DACH region (Germany, Austria, Switzerland). The graduate in business administration (BA specialisation in real estate) and Certified Real Estate Investment Analyst has now been working in the real estate industry for 25 years. She worked as a Country Manager at RICS; at ZIA Zentraler Immobilien Ausschuss as a department head for real estate and financial markets and as a consultant. Before that, she advised companies in the housing and real estate industry at the BBT Group consultancy and headed the marketing department. Sabine started her professional career at the Association of Berlin-Brandenburg Housing Companies (BBU) as a consultant to the board. During her studies, she worked for various companies in the real estate industry.

Part VI

Ten Key Messages for Resilient Cities and Real Estate

Final Remarks: Ten Key Messages

Tobias Just and Franziska Plößl

Abstract

This chapter derives ten key messages for resilient cities and real estate after the COVID-19 pandemic from the individual articles in this book. Under the continuing uncertainty, direct implications of the pandemic for cities and their individual uses and functions are shown, and then possible measures are deduced.

The aim of this study was to dare a first approximation to the possible direct and indirect effects the COVID-19 pandemic could have on European cities and to sensible adaptation measures. As we write these final remarks, the number of infections is rising rapidly in many European countries, and it remains unclear whether this will result in a fourth wave of serious illnesses or even deaths. In this respect, the results of this study are subject to the following caveat—inherent in all early interpretations with insufficient data: that uncertainty is comparatively high, and that new information in the sense of Tetlock and Gardner (2015) also requires a review of the main messages.

Nevertheless, we consider the central theses and messages in this study to be comparatively solid, because many developments observed before the pandemic were primarily accelerated in the last 18 months and not restarted. This is also underlined by the fact that our core messages are based on the analyses of many experts from different specialist disciplines, as well as an extensive survey and practical reports. It is true though that the ongoing uncertainty with regard to future developments is reflected in several inconsistent evaluations, assessments, and

T. Just · F. Plößl (✉)
IRE|BS International Real Estate Business School, University of Regensburg, Regensburg, Germany
e-mail: tobias.just@irebs.de; franziska.ploessl@irebs.de

T. Just, F. Plößl (eds.), *European Cities After COVID-19*, Future of Business and Finance, https://doi.org/10.1007/978-3-030-89788-8_23

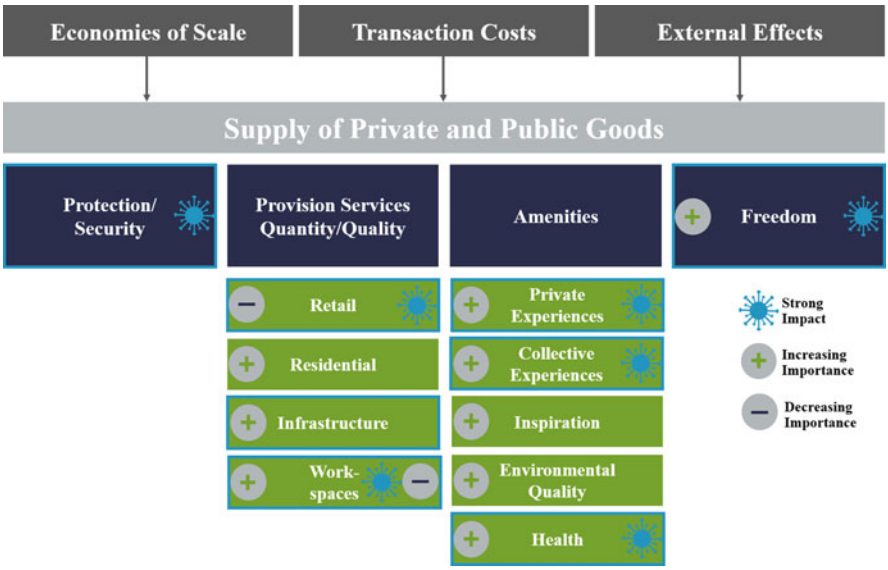

Fig. 1 Supply advantages in cities (post-COVID-19). Source: Own illustration based on Glaeser (1998) and Quigley (1998)

forecasts. The following ten key messages are focusing on the connections between the various articles rather than the differences. As for the disconnects—and there are definitely some of them between individual contributions—reference is made to individual chapters.

Precisely because adaptation processes in cities have been accelerated by the pandemic, we should not waste any time waiting for the last wave to subside. Faults can already be seen today, especially in city centres, as retailers or restaurateurs, for example must go out of business. If one waits too long to have enough data to achieve a possible long-term first-best, companies, households, and municipalities may need to make decisions and thus create new path dependencies that could represent a meaningful short-term adjustment but prevent the achievement of a long-term second-best. This could happen, for example if traffic infrastructures or building uses must be changed and planning-law measures would be required to that end. So, the price of waiting is not zero.

The pandemic has dealt a massive blow to cities and real estate markets (see Fig. 1). Since both rental and investment real estate markets usually react with a long lag, and because there have rightly been massive stabilisation measures by the public sector, some reactions have been muffled. This final chapter is divided into two parts: the first one outlines direct implications of the pandemic for cities and their uses, while the second one discusses possible measures for policy makers and actors on real estate markets.

1 Direct Impact on Cities and Real Estate Markets

1. In the wake of the pandemic, many companies (and households) invested in information and communication technology. The employee experience, i.e. investments in human capital, are possibly more relevant than the expenditure on hardware and software. This created path dependencies, some of which are likely to be irreversible. With the internet, social media, and consumer and communication platforms, a new digital infrastructure has been lying under cities for decades. During the pandemic, this "second city under the city" took over more of the classic urban functions. In fact, because of its economies of scale, the internet actually serves as a mega-city network. This affects both production and consumption. Overall, comparative advantages of ever-larger cities in Europe have been (somewhat) reduced as a result. This has become blatantly clear in the retail sector, but the same applies to conferences, trade fairs, and meetings. In many—but by no means all—cases, the virtual data world even turned out to be a superior substitute for physical meetings.
2. In the future, cities will have to concentrate much more on their consumption advantages beyond mere supply and strengthen the social and interactive aspects of production. This is initially possible through the level of care achieved and now through the learned use of different supply channels.
3. This shock affects individual real estate asset classes very differently. While demand for housing grows as many households ask for additional indoor and outdoor space, there will be permanent and significant declines in space occupancy in the retail sector. Even if demand for logistics space has increased during the pandemic—and this demand also falls on inner city last-mile logistics, one cannot generally and simply replace former retail space with logistics space. The extent to which hotels can be repurposed—and thus the increased demand for space for other uses met—will also be determined by the future legal planning framework. For office properties, the results are less clear: on the one hand, more people will (want to) do part of their work from home on a permanent basis, which reduces the need for office workplaces in metropolitan areas. On the other hand, a new network of decentralised co-working offers could be created as a replacement or additional office. It is to be expected that office workplaces themselves will change as more value is placed on collaboration and an incentive for teamwork. Both would require more space. Thus, the net effect on office space absorption does not need to be negative. However, the productivity of some inner-city areas could change, and this could be negatively related to the flexibility and/or the age of the buildings.
4. Overall, inner-city space requirements could even increase. This is especially true for vacancies that cannot be quickly reactivated. The growth dynamic, especially in the housing industry, would then be directed outwards. This is because the desire for more indoor and outdoor space, especially in residential demand, cannot be fulfilled for many households in view of rising apartment rents and prices, especially in core cities.

5. This additional space requirement also stems from a sought-after increase in communal experiences and get-togethers in public spaces. Efficient space management of these scarce areas leads to the "multicoding" of such spaces, i.e. the multiple use of certain spaces, sometimes as trading, sometimes as meeting, sometimes as traffic areas (Bundesstiftung Baukultur, 2020).

2 Shifts in and between Cities

6. Asymmetries arising during the pandemic will unevenly affect different stakeholders in cities and the real estate industry. There will be winners and losers. Cooperation between private and public stakeholders is essential for necessary changes to be initiated early and in a coordinated manner. Public city representatives play a central role in changing the planning law, but private knowledge and capital are necessary for their concrete implementation. Redensification through growth in height could represent part of the solution wherever ground floor retail space loses value, and private investors need an incentive to invest (in additional space on the upper floors).
7. This implies a greater mix of uses in buildings. The strong separation of uses was ultimately an expression of a nearly industrialised division of labour in cities. This could be reversed to some extent by making the buildings more permeable and amorphous in their use. So far, mixed-use buildings have not generally been popular with investors because they often implement a clear strategy for direct investments, avoiding the diversification of the property itself. Moreover, mixed-use buildings impose non-negligible complexities for individual uses despite sometimes positive economic factors (Nakamura et al., 2018). The pandemic is now changing the relative financial conditions in favour of mixed-use buildings, and the public sector can support such advantages through planning requirements. Flexible building typologies that also favour faster renovations would be promoted.
8. This mix of uses should not be limited to individual buildings. It is even more important to push this mixed use further into districts to clear cities as a whole of traffic areas. Strengthening short distances (within districts) forces more mixed uses in more districts. The image of the 15-minute city here is a simplification of what seems possible and necessary. Ultimately, it is about a greater relocation of central city functions (both production and consumption) from a few central locations to several locations, with a view to reducing traffic and the scarcity of space in areas that cannot be expanded. It is about a shift from a monocentric city to a polycentric one. While this process has been active in Europe for decades (Ahlfeldt & Wendland, 2013) and the call for stronger political support for polycentric structures is not new by any means (Gordon et al., 1986; Ortiz, 2014; Yin et al., 2013) the pandemic will likely accelerate it further. This does not contradict the idea that inner cities must retain core functions for the city as a whole—both in production and consumption.

9. This strengthening of districts can—if competitive freedom is indeed created—trigger innovative dynamics when districts are also conceived as innovation laboratories. For this dynamic to develop fast spillover effects, an urban platform must be created to bundle and channel learning experiences. In line with the above, all of the city's stakeholders must be represented here. There is also no reason to keep this learning process at the respective city limits. Just as the internet, like a second city network, has moved in below the cities, cities should also network themselves more closely for these "laboratory experiences".
10. For this networking to succeed, however, inner-city traffic and technical infrastructure must be updated. The smart city arises at the building, district, city, and probably also city network level. The pandemic has—among other things—led to a re-strengthening of motorised private transport. This gave rise to a new conflict of goals between climate and health goals. To ensure conflict resolution, it is helpful to strengthen the districts, use technically-supported traffic management, and promote active movement as a form of resilient mobility. This is also easier to implement in a local city, i.e. primarily oriented towards districts, than in one arranged around a single centre.

Many of these elements point in one and the same direction, which the Leipzig Charter already indicated (Bundesministerium des Inneren, für Bau und Heimat, 2020). The pandemic in no way leads to the death of the cities nor to the end of inner cities. Once again, cities are renewing themselves, and this renewal process has been accelerated by the pandemic. Real estate market players can actively help shape this process. In the end, cities that focus more on experiences, social interaction and less on structures based on the division of labour may arise. This is a process that will take decades rather than years. The more this development is opposed, however, the more likely cities could drift apart in a centrifugal fashion.

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Tobias Just is a Managing Director at the IRE|BS Immobilienakademie and professor of Real Estate at the University of Regensburg. Tobias studied economics in Hamburg and Uppsala (Sweden). In 1997, he started to work at the University of the Federal Armed Forces Hamburg. His PhD dissertation was awarded the university science prize in 2001. For more than 10 years, Tobias worked at Deutsche Bank Research. He headed the unit's sector and real estate team and was a member of Deutsche Bank's group-wide Environmental Steering Committee. In 2006, Tobias was a Research Fellow at the American Institute of Contemporary German Studies at the Johns Hopkins University. Tobias published more than 200 papers in professional and academic journals and books. Until 2021 he was President of the German Society of Property Researchers and is the editor of the ZIÖ—the German Journal of Real Estate Research. In 2018, Tobias became a Fellow of the RICS by nomination.

Franziska Plößl is a Research Assistant and doctoral candidate at the International Real Estate Business School/University of Regensburg. Franziska studied Real Estate Business (MSc) at the University of Regensburg and International Real Estate (MSc) at Florida International University, graduating at the best of her class. She has published on various topics, including CREM, nursing homes, and megatrends, in the real estate industry.