THE COLOURS OF SPATIAL PLANNING

PERSPECTIVES FROM THE TU WIEN'S RESEARCH UNITS

Thomas Dillinger
Michael Getzner
Arthur Kanonier
Sibylla Zech
(Ed.)

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INTRODUCTION

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The Spatial Planning programme of study at the Faculty of Architecture and Planning of the TU Wien celebrated its 50th anniversary in 2020. Numerous activities were planned. In November 2019, an International Urban Studies Conference launched the jubilee year, followed by a conference on spatial energy planning in February 2020, itself closely followed by the AESOP Heads of School Meetings in March 2020, which only partially took place. It was during the AESOP event that the COVID-19 pandemic broke out, with hitherto unimaginable restrictions on academic activities and public life.

This first COVID year was also the year when the Spatial Planning 2020 yearbook, titled *Fifty Years of Spatial Planning at TU Wien. Studying – Teaching – Research,* was completed. The approximately 690-page anniversary volume offers a colourful spectrum of some sixty very diverse contributions. The first part, Studying Spatial Planning, provides insights into the formative period of spatial planning training, sheds light on the current education approaches, and offers perspectives on the future. In the second part, the eleven research units that play a major role in teaching explain their individual conceptions of spatial planning. In addition, you can read contributions, looking back or taking a forward-looking perspective on our course of study, by former professors and long-standing colleagues who have significantly influenced its development in recent decades. These include a rector, a vice-rector, three deans of the Faculty of Architecture and Spatial Planning, and a former board member of the Institute of Spatial Planning, which was created by merging in 2004. The third and fourth parts contain contributions by colleagues from various fields of activity who responded to our call for chapters. The contributions are dazzling and unique, as are the authors. The titles of the two main parts are: Understanding Spatial Planning and its Challenges, and Disciplinary Perspectives on Spatial Planning.

It is hoped that readers will enjoy reading the yearbook. The contributions are meant to show the diversity of our teaching, planning, and research, stimulate thinking, encourage reflection on one's own spatial planning activities, and fuel discourse. On 19th November 2020, the yearbook was presented as part of a two-day online event celebrating the 50th anniversary of the course of study and, the next day, yearbook contributors read excerpts from their texts during a spatial planning matinee. Afterwards, selected quotes of the yearbook were discussed. In 2021, yearbook contributions formed the basis for technical discussion events that took place on 15th April and 23rd June on the following topics: Back Then & Tomorrow, and Country & City.

Looking back, one may conclude that the yearbook has lived up to its claims. It has contributed to the German-language scientific discourse and will, hopefully, continue to do so. Hence the motivation for the present English-language excerpt from the Yearbook of Spatial Planning is already clear. The team of authors received a great deal of appreciative feedback on this book, both nationally and internationally, and it was often suggested that an English-language version should also be published.

We have taken up this suggestion with much gratitude; now the eleven yearbook contributions by the research units, some of them edited, can be read in English in this book. At this point, many thanks go to Denis Wizke, who is responsible for the design, as he already was for the German-language version, as well as to Roxanne Powell for the translation.

To conclude, may we quote from the editor's foreword to the German-language Spatial Planning 2020 yearbook: 'Securing the sustainable future development of our society through planning — in order to combat the climate crisis, biodiversity loss, land take and urban sprawl, dwindling natural resources, and social inequalities — is our primary normative goal, no matter how seemingly insurmountable the framework conditions may shape up. Universities, and in particular the Spatial Planning course of study at the TU Wien, will in any case continue to make their contributions to research and teaching. We are fully convinced of that.'

'In the coming years, it will be one of the core tasks of the Research unit of Law to explore such a comprehensive new conception of spatial planning legislation at the Länder *level. Comparative legal work provides a good angle for this.'*

D. DAMJANOVIC

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50 YEARS OF SPATIAL PLANNING FROM THE PERSPECTIVE OF THE RESEARCH UNIT OF LAW

LAW RESEARCH UNIT
UNIV.-PROF. DR.
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1. AT THE BEGINNING

The Law research unit has been part of the Institute of Spatial Planning since the 1971/72 academic year. In this respect, the Law unit was one of the pioneers of the newly founded field of spatial planning studies. The 1971/72 academic year came at a time when spatial planning legislation was undergoing a deep transformation. From a legal framework whose primary objective was security (i.e. mutual impairment or endangering of other types of designation should be avoided as much as possible) towards a legal framework aiming for a more comprehensive content and planning-oriented spatial design (Lendi 1998, p. 5; ÖROK 2018, p. 71). Overall, this period was marked by a planning and management 'euphoria' (Ritter 1998, p. 14). It is probably in connection with this larger picture that law was allocated an important role in spatial planning studies right from the start.

2. FRAGMENTED COMPETENCES IN SPATIAL PLANNING: AN ONGOING LEGAL PROBLEM

At that time, all the Austrian *Länder* had enacted their own spatial planning laws, which replaced the original housing laws: Salzburg was the first to do so in 1956, Vorarlberg the last in 1973. This development stemmed from the well-known competence decision by the Austrian Constitutional Court in 1954, in which it defined the legal situation as regards competence in the field of spatial planning, which is still valid to this day: *'The orderly, anticipatory overall design of a given area* [...] *is* [...] *a matter for the Land insofar as none of the planning measures, in particular those pertaining to the domains of the railways, mining, forestry, and water legislation* [...] *are expressly reserved for legislation, or even enforcement purposes, to the federal level'* (VfSlg 2674/1954). Even then, the Constitutional Court itself admitted that such a division of powers *'with regard to one and the same space, because it exists only once'*, could entail *'difficulties and friction'*, as such *'stemming from the nature of the federal state'*. Indeed, this fragmented jurisdictional framework in relation to competence and, in particular, the fact that overall spatial planning is reserved solely for the *Länder,* while the Federal level does not assume any coordinating role (unlike in Germany or Switzerland, for example), has often led to difficulties in adequately grasping the challenges in spatial planning.

This, in the literature and legal policy discussion, has already been pointed out several times. Meaningful proposals for a redesign of the allocation of competences in spatial planning aiming for *'unity in diversity'* have been around for a long time (Madner & Grob 2019, p. 522). However, in view of the fact that such a reform of competence would not only require a two-thirds majority in parliament but also the consent of the *Bundesrat* and, thus, ultimately of the *Länder*, it does not seem politically feasible in the foreseeable future. Therefore, one

THANK YOU SO MUCH!
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of the main tasks of spatial planning lawyers will continue to be to learn to deal with the present legal framework concerning competence in the best possible way and to develop instruments that enable an efficient coordination of the various levels of planning in accordance with the principle of consideration developed by the Constitutional Court (Öhlinger & Eberhard 2019, margin number 284 et seqq.).

This also seems to be particularly appropriate at the moment if we wish to deal properly with key future spatial planning issues, which are discussed under the heading of spatial energy planning. If, thanks to land management, spatial planning is to contribute to promoting climate-friendly mobility, reducing energy consumption and CO_2 emissions, and increasing the share of renewable energies, then spatial, energy, and transport planning procedures will have to be more closely interlinked (Madner & Parapatics 2016, p. 134). It is questionable whether the existing purely informal cooperation and coordination channels between the Federal level and the *Länder,* for example through the Austrian Conference on Spatial Planning (ÖROK) or the 'ÖREK Partnership', in the wake of the 'Austrian Spatial Development Concept' (see Gruber & Pohn-Weidinger 2018, p. 45), will be sufficient for this purpose. These non-binding instruments could be supplemented and underpinned by agreements between the Federal level and *Länder* according to Article 15a of the Federal Constitutional Act (B-VG). Research is needed on whether and to what extent such a binding coordination mechanism could be called upon additionally in the field of spatial energy planning, and on the formulation that it would require in order to grant the pursuit of spatial energy planning objectives an increased binding force. In addition, binding requirements for sustainable settlement structures and coordinated spatial energy planning could also be created through the sectoral planning competences which the Federal Government possesses (for example in the energy and transport sectors). Indeed, as Madner & Grob explain, the Federal level has not made full use of its sectoral planning powers yet: there is still some more *'elbow room'* here (2019, p. 523). In this respect, too, it is still necessary to investigate in detail — according to the specific requirements of spatial energy planning — how far the options of the Federal level actually extend, in particular also taking into account the *Länder's* overall spatial planning competences.

3. THE NEED FOR A COMPREHENSIVE REDESIGN OF SPATIAL PLANNING LEGISLATION AT *LÄNDER* LEVEL

Another aspect of the competence mix in spatial planning, which is also frequently criticised from an environmental perspective, is the fact that municipalities adopt Local Plans as part of local spatial planning within their own sphere of influence. Amongst other things, according to expert opinion (including Holzer 2016, p. 135), this is said to have contributed to the fact that land take and urban sprawl in Austria have increased sharply over the past decades. This is because municipalities, competing with each other for residents and jobs, have usually given preference to economic and financial interests (at least until now) and, accordingly, to the overbuilding

these entailed over the requirements of settlement developments that would reduce land take.

The fact that local spatial planning is part of municipal self-governance was expressly stated in 1962 in the Federal Constitutional Law in Art. 118 para. 3 (Federal Law Gazette I 205/1962) and has since been confirmed by several rulings of the Constitutional Court (VfSlg 8227/1977 and 12169/1989). The constitutionally protected right to self-governance is a guarantee for municipalities that they can exercise their duties without being instructed to do so and that supervision by the *Land* will be limited to violations of the law. However, it does not include the right to a specific formulation of the substance of the duties assigned to them by law (VfSlg 14073/1995). It is therefore legally possible to lay down by law specific requirements for municipalities with regard to implementation in their own sphere of activity.

So far, the planning laws of the *Länder* have largely emphasised final regulation, i.e. primarily enshrining principles and objectives. This is claimed to be justified, on the one hand, by the nature of planning law and, on the other hand, by the need to ensure administrative flexibility in this domain (for more details, see Kleewein 2019, p. 213 et seqq.). This approach certainly needs to be questioned, especially in view of current developments. It is clear that the actual designation of land cannot be decided by law. However, far more precise requirements are already possible at the legislative level, going beyond the mere definition of principles and objectives which, besides, often contradict each other. Hence, apart from setting principles and objectives, spatial planning legislation has already begun to establish concrete instruments for sustainable settlement development and land-take reduction. In particular, the various instruments for building land 'mobilisation' should be mentioned, for instance: legal rules on the conclusion of agreements between a municipality and a landowner (so-called 'contract-based spatial planning'); temporary building land designations; or service infrastructure or development levies (for an overview, see Kleewein 2017).

So far, however, these instruments have produced little effect. Indeed, according to the Federal Environment Agency, within Europe Austria continues to experience the highest per capita loss of land owing to soil sealing. We can therefore only concur with Weber, who calls for a fundamental rethink of the spatial planning legal regime. It was primarily conceived as a way to regulate how greenfield land could be designated into building land. This originated in the above-cited Constitutional Court judgement in 1954; it defined overall spatial planning, which falls within the competence of the *Länder,* as follows: *'The orderly, anticipatory overall design of a given area with regard to its development, in particular for residential and industrial purposes, on the one hand, and for the preservation of essentially undeveloped areas, on the other'* (VfSlg [decision] 2674/1954). At the level of local spatial planning, this has led to all instruments *'being fixated on the transformation of green meadows into built-up land'* (Weber 2016, p. 8 & 11). In order to actually achieve an economical land take and avoid urban sprawl through local spatial planning, a fundamental paradigm shift — from *'building-land increase to building-land reduction'* — is required (Weber 2016, p. 12).

In the coming years, it will be one of the core tasks of the Research Unit of Law to explore such a comprehensive new conception of spatial planning legislation at *Länder* level. Comparative legal scholarship provides a good angle for this.

4. THE INCREASED GREENING OF SPATIAL PLANNING LEGISLATION THROUGH EUROPEAN UNION LEGISLATION

The configuration of spatial planning laws and, thus, of spatial planning, was and still is to a great extent determined by the fundamental right to property (Art. 5 StGG, Art. 1 1. ZPEMRK) and, in conjunction with this, the principle of equality (Art. 7 B-VG). Indeed, at the constitutional level, these guarantee subjective rights such as the protection of individual property against state interference. They play a particularly important role when spatial planning measures might interfere with the existing, acquired rights of landowners, such as a building land designation. This is increasingly the case, in view of the fact that spatial planning must deal with existing conditions (e.g. approved designations or oversupply of building land) and make corrections to undesirable developments over recent years. With reference to Helmut Feuerstein, Weber once described this figuratively as follows: *'We are writing on a board that is already completely scribbled over'*, whereby the board here *'stands for the urban sprawl and fragmentation of the open, settled landscape that is far advanced throughout Austria'* (Weber 2016, p. 8).

Until the late 1990s, the interests of landowners were given priority over the interests of meaningful spatial planning. Rill summarised this in 1991 as follows: *'Fundamentally, the shaping of spatial planning as positive planning runs contrary to the protection of ownership rights, because the sole interest in the realisation of a planning scheme cannot be considered a worthy public interest in view of the protection of ownership rights.'* In addition, the protection of ownership rights entails the preservation of trust in the assets recorded on the plan, which is why any changes to spatial plans may only be carried out under strict conditions (Rill 1991, p. 195 et seqq.). This view is essentially based on the fact that a fundamental right to property and other fundamental rights of economic life (e.g. freedom of acquisition) are enshrined in the Austrian Constitution, whereas, for example, a fundamental right to environmental protection is not. In addition, in the 1970s, the view prevailed that the constitutional protection of ownership rights fundamentally aimed to safeguard a market economy regime (Korinek 1977, p. 15; Rill 1991, p. 186). Rill concludes from his review that no decisive obstacles to land and environment policy will arise: *'Meaningful land and environment policy cannot and will not fail because of fundamental rights'* (Rill 1991, p. 205).

In view of undesirable developments in spatial planning over recent years —as regards land take and urban sprawl — and the resulting need for corrections to approved designations, which would interfere with the protection of ownership rights (e.g. land 'mobilisation' measures or redesignation to reduce the oversupply of building land), one would probably form a different opinion today.

In the case law of the Constitutional Court, the incorporation of environmental aspects into spatial planning, especially since the 1990s, has already led to some shifting in the importance attributed to the interests of landowners as regards property rights protection and those of the public as regards environmental protection. On the one hand, incorporation took place for the first time in 1984 by embedding environmental protection at the constitutional level, at least as a state objective (Federal Law Gazette 491/1984), and in revised form in 2013 (Federal Law Gazette I 111/2013). On the other hand, Austria's accession to the European Union (EU) has led to some greening of spatial planning legislation, since it required the implementation of a number of EU environmental regulations, including some concerning spatial planning, in particular: Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (OJ 1992 L 206/7 as amended by OJ 2014 L 95/70); Directive 2009/147/EC on the conservation of wild birds (OJ 2010 L 20/7 as amended by OJ 2019 L 170/115); Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (OJ 2012 L 26/1 as amended by OJ 2014 L 124/1); and Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (OJ 2001 L 197/30).

Nonetheless, the Constitutional Court continues to regard the redesignation of building land into greenfield land without any compensation as unjustified if this is solely based on the need to reduce the oversupply of building land (VfSlg [decision] 17112/2004; 17223/2004). It has also ruled that private law instruments (so-called 'contract-based spatial regulation') cannot be used at the discretion of municipalities for legal protection reasons; in particular they may not be linked to public law measures, such as designation (VfSlg 15625/1999). However, it does allow redesignations of building land into greenfield land (without any compensation as well) if these are required for legal nature conservation purposes (VfSlg 18304/2007). In principle, it also allows the use of contract-based spatial rules as a tool for building land 'mobilisation', provided that certain requirements are observed. Likewise, temporary building land designations and service infrastructure or development levies may be defensible, with the public interest concerning sustainable settlement development in mind and, to that extent, may qualify as permissible restrictions to the fundamental right to property (for details, see Onz & Mendel 2017, p. 11 et seq.).

It is to be expected that further action by the European Union in the field of environmental protection and, in particular, climate protection will lead to a further greening of Austrian spatial planning legislation. This is because land-use issues are relevant to climate protection in several respects: to ensure the development of energy-saving, traffic-avoiding settlements and built-up transport infrastructure areas; to provide space for the 'space-friendly' expansion of renewable energies; and as a precaution to safeguard ground areas for CO_2 storage purposes (Fleischhauer et al. 2013, p. 95 et seq.). For legal scholars and, in particular, for business and environmental lawyers, an absolutely crucial question in future will be to bring the requirements of environment and climate protection into line with the fundamental, constitu-

tionally protected right to property as well as with other fundamental rights of economic life (e.g. freedom of acquisition). In this regard, at an abstract level, the general question is about how to achieve a balance of economic interests with those of environmental protection, and how these trade-offs might be translated into general rules by the legislator. In other words, what would the legal framework for an ecological market economy look like?

5. LIBERALISATION OF INFRASTRUCTURE SECTORS: THE GROWING COMPLEXITY OF PLANNING ESSENTIAL PUBLIC SERVICES

The Europeanisation of the Austrian legal system has not only led to a greening of the spatial planning regime but also to the liberalisation of sectors of general interest. These are, above all, nationwide network industries, such as electronic communications and the railways, as well as the energy sector. On the other hand, for those essential public services that are primarily provided by local authorities (e.g. waste disposal, sewage, water, public passenger transport, and local transport), no opening up of the market through the introduction of market competition has taken place; rather, the market has definitely been circumvented by commissioning the provision of services to private third parties (Damjanovic 2015, p. 218 et seq.).

In any case, wherever private companies now operate under market competition as a result of these developments (instead of, as previously, state monopolies), state planning in these sectors and coordination with spatial planning are becoming much more complex. This calls for new instruments that would enable collaboration with third parties (so-called 'public-private partnership' arrangements) yet at the same time must not lead to distortions in the competitive market in which they operate. The necessary state planning in the sector of essential public services (ÖREK 2011, p. 50 et seqq.) and the associated collaboration with private companies must therefore be brought into line with the principles of an open competitive market. The main sets of regulations that can ensure the latter are public procurement law (in the case of commissioning by the state) and state aid law (in the case of state financing of private companies).

The principles of open market competition and the requirements of EU state aid legislation also pose major challenges to the legal framework for non-profit housing, as such a well-established sector in Austria: its compliance with state aid law has been called into question (Gruis & Elsinga 2014, p. 463ff; Storr 2012, p. 401 et seqq.). At the same time, social housing requirements (i.e. building more and cheaper units) conflict with environmental housing requirements, namely: the reduction of land take and the construction of energy-efficient housing, which entail additional costs. The specific task of the legal framework will therefore be to fulfil both the principles of open market competition and the requirements of social as well as environmental housing by reforming housing subsidy rules.

The fact that environmental and social objectives are often not easy to reconcile in the provision of essential public services is also shown by the call for the true costs of infrastructure development to be made public in order to avoid urban sprawl; this is diametrically opposed to the principle of non-discriminatory provision of essential public services (= guaranteed basic services) to all (ÖIR 2008, p. 43). Whether and how such contradictions between social and environmental concerns in the essential public services sector can be resolved through legal provisions is an equally interesting and important question.

6. FUTURE TOPIC: SMART CITIES — A LEGAL CROSS-CUTTING MATTER

Another future topic at the Institute of Spatial Planning, to which the Research Unit of Law would like to devote particular attention to in future, are so-called *smart cities* (Frey et al. 2016; Arleo et al. 2019). This umbrella term basically describes holistic urban development schemes. These schemes seek to make cities more environment-friendly, technologically advanced, efficient, and inclusive in economic and social terms (Rödig 2015, p. 14 et seq.). They are primarily to be implemented through technical innovations and, also, economic and social ones.

Data protection and data ownership, for example, are important aspects that must be taken into account in the context of smart cities. With regard to the implementation of Big Data applications, a balance between the protection of individual personal data and the public interest above all needs to be found. In this context, data security (e.g. the protection of smart city systems against hacking) will also play an important role (Berger 2018, p. 10 et seq.). It is precisely those new technologies that are to be used in smart cities that must be examined from this perspective. Thus, for example, 'Internet of Things' applications allow numerous devices to be interconnected (e.g. control of heating via mobile phone app). Although this leads to systems operating more efficiently (e.g. energy savings), conversely, more and more personal data is being generated and collected. In the absence of safeguards with regard to data protection and security, not only the legal admissibility of these systems, but also user acceptance, might be in doubt (Pollirer 2019).

Another point is data ownership: local authorities often collaborate with private companies within the framework of smart city projects. These, in turn, generally collect raw data (e.g. sensor data in the traffic domain) and are thus, in effect, 'owners' of these data. In order to retain control over the (further) use of smart city data, the competent authorities must ensure that, ultimately, they have the power to control these data (Morozov & Bria 2017, p. 68).

Conversely, in some cases the local authority itself might have data at its disposal (e.g. geodata or environmental data) (Riesenecker-Caba 2016, p. 15) that might be of interest for science or industry. For instance, such data may enable research institutions to derive analyses of urban changes or ICT companies to develop new services (Riesenecker-Caba 2016, p. 23). The extent to which public authorities may, or even must, make such data available (so-called 'open data systems') is therefore debatable. Since data generation is often associated with costs, the question also arises as to whether a corresponding fee may be charged (BBSR 2019, p. 9 et seq.).

As in other domains of spatial planning, contracts under private law (under the catchword 'urban development contract') and other private law

legal entities (e.g. companies) will also play a key role during the transformation into smart cities as public authority instruments for the implementation of smart city projects. Here, too, the public sector will have to rely heavily on collaboration with private companies in order to achieve its goals. The use of private law instruments by the public sector is, in turn, associated with specific legal issues that are addressed under the heading of 'private-sector management': for example, does the public sector enjoy the discretionary power to depart from its classical forms of action (e.g. ordinance and decision) and carry out public tasks through private law instruments? To what extent is public action carried out by private entities to be predetermined by law? However, the use of agreements or limited companies by public authorities also raises a number of questions from a civil law perspective: how can the city's obligations towards its citizens with regard to certain public tasks be implemented through contracts with private companies and transferred to these or, in other words: how can the joint exercise of responsibility by the public and private sectors be managed by contract and where are the limits of contractual freedom? If innovations are jointly developed through collaboration between the public sector and private companies, above all the use of intellectual property rights thus produced has to be managed by contract.

Of course, the conclusion of public-sector contracts with private companies also puts the public procurement regime at centre stage of these processes, since public procurement law will, in principle, always apply when a public authority concludes a contract with a private company. With innovative procurement made possible through the so-called innovation partnership created by the latest amendment to public procurement legislation, public procurement is also gaining in importance as a demand-side instrument of innovation policy: as market buyer, public authorities can steer the technologies that are to be developed at all and thus adjust these processes to meet the needs of the city and society (Edquist et al. 2015, p. 1 et seqq.). Our future task will consist in exploring in more detail how to best exploit this potential for future challenges in urban development.

In addition to public procurement, public participation processes are another tool that can ensure that the residents concerned and society can also have a say in the deployment of new technologies, and that these decisions are not taken solely by the market on the basis of economic interests. Public participation processes have long been highly rated in urban planning (Altermann 1982, p. 295), but this is not reflected in the relevant procedural rules. In contrast to environmental procedures (e.g. an environmental impact assessment), for which residents and the general public are granted legally safeguarded participation rights thanks to the institution of subjective rights, in informal urban planning public participation processes these are still largely lacking. In view of their increasing importance for the development of smart cities, we wish to work towards the creation of a procedural basis that would also legally safeguard the democratic design of participatory processes within the framework of smart cities.

7. CONCLUSION

The present chapter showed that spatial and urban planning currently raise a variety of legal issues. Above all, it is clear that many — sometimes conflicting — interests are at play in this sector. An essential task for legal science is, precisely, to reconcile these interests and find answers to the questions raised. The staff of the Research Unit of Law— which has radically renewed itself in this anniversary year — has set itself the goal of investigating these issues thoroughly, as well as work out sustainable and innovative solutions through interdisciplinary collaboration.

In this sense, here is to another exciting fifty years of spatial planning and law!

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‘Research at the SRF is not an end in itself. In terms of content, all research activities are characterised by an effort to achieve a clear problem orientation and socio-political relevance. This is the best basis for research-led teaching, which is organised in didactically clearly structured courses on theories and methods.’

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THE ROLE OF URBAN AND REGIONAL RESEARCH IN SPATIAL PLANNING AND DEVELOPMENT

RESEARCH UNIT ON URBAN AND REGIONAL RESEARCH

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1. INTRODUCTION

‘There is nothing more practical than a good theory’. This sentence was originally attributed to Ludwig Boltzmann (1844–1906), a physicist and philosopher. But Hermann Ludwig Ferdinand Helmholtz (1821–1894), polymath, and Kurt Lewin (1890–1947), the founder of modern social psychology, also affirmed that, as the level of complexity of issues increased, theory and practice would become inseparable. This aspiration — not separating theory (research) from practice (planning) — should be self-evident in an application-oriented domain such as spatial planning education at the TU Wien. The research unit on Urban and Regional Research is all the more committed to this *leitmotif* as the requirements for researching and understanding spatial development, in general, and urban and regional development, in particular, become more complex. Without going into paradigmatic requirements regarding the question of which philosophy of science we, as researchers or planners, are committed to, two major challenges confront transparent, understandable spatial research and effective spatial planning now more than ever: (1) a methodology that is as comprehensive and precise as possible, based on a clearly recognisable understanding of space (see Läpple 1991; Werlen 1987; Weichhart 2008; Löw 2001, and others) and thus adopts a certain methodological canon; (2) a multi-level perspective, which is indispensable for explaining and understanding spatial development or its targeted management. For only if these two challenges are met will it be possible to: (a) contextualise local problematic situations and planning tasks at the macro level, (b) work out their significance and impacts as regards sustainable and resilient development at the meso level and, (c) evaluate positive effects on the quality of life and of the environment at the micro level, and support these through planning strategies and measures.

Spatial development and planning practice are determined by the actions of the actors involved under certain economic, social, and institutional conditions. These framework conditions allow room for manoeuvre and establish social power structures through which interests may be asserted. Spatial development and spatial planning therefore become all the more complex the more the interaction between individual action and community structures (i.e. spatial, social, economic, ecological, and political ones) is viewed as an object of research or planning (Geels 2020). The question of the significance of new technologies, which are themselves the result of the socio-technical environment of a region or a city, should always be considered as well. As already pointed out by Balducci (2012) in the early phase of the Smart City debate, technology plays a twofold role: on the one hand, it is a driver of development, since it brings about massive changes to production and communication options; on the other hand, it is at the same time an instrument for improved spatial observation, namely both of spatial changes or trends and planning interventions (Batty et al. 2012).

This chapter seeks to consider the activities of the research unit from two perspectives: first, the most important research work of recent years — its themes and underlying theoretical and methodological approaches (for example with regard to the understanding of space or the methods used) — is briefly presented with regard to the three research priorities of the SRF (see section 2, 3 and 4). Building up on this, the major urban and regional research challenges and topics of the coming years are discussed: here, the focus lies on the question of which approaches and methods will be needed in order to be able to analyse, assess, and explain spatial development in a goal and problem-oriented manner in the future and how, to this end, theory and practice should be integrated differently/in a better way than before in order to strengthen sustainable urban and regional development.

2. THE 'URBAN DEVELOPMENT, SITE USE AND ASSESSMENT IN A GLOBAL-LOCAL CONTEXT' RESEARCH FIELD

Against the background of given territorial conditions, local use patterns, as well as urban development and transformation processes constitute a traditionally important research area. In this regard, the starting points of many years of research activities were the interplay between housing market dynamics and changes in location quality brought about by planning policy interventions in the locational structure of cities. Since the 1980s, various research activities have emerged in this field, for example on the significance of urban renewal policy for urban development (SANSTRAT Vienna) or on the effect of urban renewal and housing policy strategies on structural, market, and socio-spatial dynamics (e.g. STEP05 and SRD Vienna).

Recent research activities in urban settlement areas have been carried out for years on the basis of small-scale analyses of real estate market development and the assessment of individual site uses. The basis for property valuation is the 'hedonic price' model, according to which it is possible and meaningful to estimate and simulate the value of heterogeneous goods' features by using complex statistical methods. From a regional science point of view, property valuation primarily means site valuation, in particular with regard to location and accessibility. In view of the need for reliable value estimates, the models that were conceived for valuation purposes (GP-SIM, LIEBE, PRO-IMMO, MSN, and Immformer) are used, amongst others, at the Austrian National Bank (OENB), by businesses, and public institutions (municipalities, via Donau, etc.). In contrast, the family of behaviour-oriented gravity models forms the basis for the location assessment of pharmacies (supply potential of pharmacies). The sales potential of pharmacy locations is estimated on the basis of precise accessibility and alternative opportunities, taking into account demand behaviour, in order to be able to make comparable appraisals of locational suitability across the entire Austrian territory.

For several years now, research activities have focused on the transformation of energy supply issues — namely, in terms of increased supply efficiency and of increased use of renewable energy resources — taking into account global trends and changing conditions. The central methodological starting point for modelling 'heat requirements' is taking into consideration building shapes and building configurations. In addition to factors (already taken into account in conventional models) such as the date of construction, building type, and building use, energy loss via the building envelope is also included. In the two most recent projects on this topic, the space heating energy requirement thus determined was recorded, together with current heat supply solutions, and compared with potential renewable energy resources at the local level. This comparison forms the basis for the assessment of courses of action for integrated spatial energy planning with regard to strategies towards decarbonisation. In addition to numerous modelling approaches to the analysis of small-scale energy requirements in heterogeneous settlement structures within Austria (e.g. Energy-related Spatial Typology Vienna, AnergieUrban), some projects (e.g. E_Profil) focus on web-based tools that enable and support this transformation at the neighbourhood level, or deal with process analysis from the point of view of spatial energy planning (PBM_integrativ).

This work on small-scale development in the dimensions of 'socio-spatial changes', 'assessment of site use', 'price development' or 'energy requirement' is characterised by the effort to promote sustainable development as well as a theory-based, transparent processing with high methodological standards. This is achieved, in particular, by using mainly quantitative methods (multivariant statistics and GIS-based modelling).

The main challenges

In the context of fast-growing cities, the provision of high-quality and, above all, affordable housing constitutes an urgent challenge, as one Ph.D. dissertation currently discusses with the help of multivariate statistical procedures. Regional economic research, taking into account spatial effects on social affordability, promises to make an important contribution in view of the social issue of housing. The long-term provision of affordable housing requires a fundamental understanding of local housing markets, their dynamics, and their spatial organisation, as well as their integration into global structures, in particular international financial markets. At the same time, the consequences of housing policy must be made measurable and practical strategies for ensuring housing provision must be evaluated on an empirical basis.

For about ten years, spatial energy planning has been pursued in research and teaching at the Institute of Spatial Planning at an accelerated pace. Research on spatial energy planning, in view of environmental problems or global climate protection goals, has been gaining increasing importance in the long term. At the SRF, research on energy requirements is being promoted in two directions: on the one hand, the usability of small-scale or property-related data must be accurately assessed, and they are to be improved to enable meaningful use in research projects. It is only on the basis of improved small-scale data (which are increasingly available thanks to smart technologies) that models can estimate local energy resource usage and local energy supply, along with the effects of planned measures towards energy efficiency or the effectiveness of climate protection measures. On the other hand, building structures and building qualities are of great and

lasting importance for energy provision, especially in view of the persistence of long-running infrastructure systems and the varied lengths of structural life cycles. It is precisely thanks to the comparatively long period of use of buildings that there is great potential for increased energy efficiency or switching to renewable energy sources. However, this is an area in which public planning decisions and business decisions often conflict or, in any case, suffer from reciprocal information deficits, as recent research at the SRF showed. In addition to quantitative GIS-based modelling work, a thorough process-oriented analysis of the interests of actors and stakeholders would be required; priority in this regard is to be given to transdisciplinary studies of social networks and stakeholders. The research approach to energy planning at district level is to be further intensified on the basis of integrated information concerning buildings, property uses, and the embedding of energy generation and supply into neighbourhood conditions.

3. THE 'URBAN SYSTEMS AND URBAN TRANSFORMATION UNDER GLOBALISED CONDITIONS' RESEARCH FIELD

In a second research perspective, cities and urban regions are examined with regard to their positions and the challenges they face within European or global urban systems. In particular, geopolitical changes brought about by integration and globalisation processes in recent decades have given rise to questions such as: in what ways are the positions of cities and regions changing in the face of increasing competition? What does competitiveness mean and which locational factors are gaining or losing ground as a result of changed national or regional conditions? What is meant by new planning concepts such as the Smart City and, in this regard, what role do new technologies play in urban development and strategic planning?

These research activities began at the end of the 1990s at the SRF in the light of geopolitical changes brought about by the European integration process, which placed urban land-use systems and individual cities under new development conditions. Competitiveness issues were first addressed by the first, smaller projects dealing with spatial development in Vienna, Budapest or Bratislava and, later, by international research projects. On the one hand, research was conducted on metropolitanisation processes and polycentric developments in Central Europe, in order to create development potentials and strategies based on the components of territorial capital (POLYCE). On the other hand, the European integration process and national border effects were analysed in detail through social network analysis in cross-border regions (MetroNet).

Smart city research activities began in the 2000s with a project aiming to position Austrian medium-sized cities within the European urban system (Graz Smart City). Several smaller projects followed, making use of updated data or examining various urban groupings in Europe. Here, on the basis of their individual paths, cities were viewed as the result of the interaction between various actors in dealing with existing assets and deficits. Using a holistic point of view, urban development was described according to six dimensions on the basis of numerous indicators and with the help of a hierarchically structured city profile; thanks to an easily understandable benchmarking, cities may thus be compared with each other. This evidence-based and transparent approach is easy to understand despite the complex facts related to the generated city profiles; it provides an empirical starting point for comparative assessments of cities as well as for working out strategic recommendations and roadmaps (for information, see the *European Smart City* website). This approach has become the foundation for further projects on sustainable strategic planning, both at the national (Smart City Profiles) and international levels (PLEEC and Smart KOM Kraków). By building on identified potential and in-depth analysis, it was possible to work out strategic recommendations for energy-efficient urban development projects for each city together with local stakeholders. Furthermore, benchmarking was the starting point for a network-oriented approach in which both assets and deficits could be assessed during numerousfocus group workshops, while corresponding roadmaps for specific urban development domains could be prepared.

The main challenges

For cities, governance and planning issues are becoming increasingly complex in the face of massive global trends such as climate change, pandemics or economic crises. Previous development paths are being called into question; planning approaches must be redesigned in view of their insufficient effectiveness to achieve sustainable development in times of socio-spatial polarisation, massive environmental and emission problems or congested infrastructure systems.

Two specific challenges are viewed as particularly pressing within SRF research activities: (1) issues related to the significance of new technologies and an up-to-date understanding of 'open innovation' in planning processes and, (2) issues related to the requirements for the improved resilience of urban systems in the face of changing climatic, health-related or socio-economic conditions.

New technologies in the field of ICT and digitalisation have a massive impact on energy supply, energy efficiency, travel behaviour, and Industry 4.0. This is changing behaviour patterns and lifestyles as well as interdependencies within production processes and value chains. The structures of cities are changing and developments are taking place under altered conditions, which require new responses to critical trends and the adjustment of transformation processes. Technical innovations in the ICT sector, at least since Web 2.0, have boosted the smart city debate; this has prompted new questions about opportunities and threats for management and planning. Hence central research questions must address the effects on urban development that we can identify and the opportunities opening up for new steering mechanisms. Two doctoral dissertations on different topics, and applying different methods, are dealing with such questions: while one thesis, which meanwhile has been accepted, used various social network analysis methods and indicators to assess the quality of the transdisciplinary implementation of green infrastructure projects, a second thesis is currently dealing with the implications of new technologies (drone recordings) for planning processes in informal settlements.

Research in this area must also critically examine the opportunities that technological innovation provides for improved, sustainable, and resilient urban development and, above all, how new technologies can contribute to social inclusion. In this regard, smart city projects at the SRF have so far mostly been related to questions of energy efficiency and the transition to renewable energy sources; yet they have also dealt with participation and inclusion in decision-making. In order to counter the technology-driven character of smart city development, from a planning analysis point of view an understanding of open innovation must be placed at the centre of planning-related research, which should link up local and global knowledge within participatory processes. In this way, modern technology, rather than being an objective, is used as a tool specifically to assist planning activities. Scientific work is currently underway on the importance of modern technologies in the planning process and addresses open innovation as a relevant steering mechanism. This topic will also be explored in a publication initiative with the help of globally organised workshops and corresponding research contributions.

4. THE 'DRIVING FORCES AND CONCEPTS FOR REGIONAL DEVELOPMENT IN MULTI-LEVEL PERSPECTIVE' RESEARCH FIELD

The third research priority focuses on the forces that drive the development of regions. Against the background of important global trends (e.g. service economy and knowledge economy, digitisation, climate change, technological progress, etc.) as well as the embedding of regions in institutional (political and administrative) systems, it deals with a wide range of research questions with planning relevance concerning regional development. Since the 1990s, the digital mapping and modelling of transport accessibility within and between regions has been of particular importance. By applying graph-based methods, spatially differentiated indicators mapping travel options between locations featuring different uses can be determined, as well as their significance for traffic performance and regional economic development.

As part of international research projects such as SASI and BW21, or national studies related to the Federal Transport Infrastructure Plan (BVWP), the influence of accessibility levels on regional economic development was estimated with the help of regional production functions, which made it possible to assess the effects of large transport infrastructure projects. In recent years, further efforts have moved towards the most realistic possible recording of walking, driving or journey times, while also including travel time and money expenditures, as well as their subjective perceptions. The small-scale accessibility measurements defined and calculated in this way are always differentiated by the mode of transport and can thus be allocated to multimodal indicators. Preferences of the population with regard to the relevant destination and modal choice are thereby taken into account and differentiated by user group. By means of such differentiated indicators, various research projects (e.g. Mobility2know, GesMo or Active8) investigate the impacts of accessibility levels on user behaviour and derive recommendations for sustainable and demand-oriented mobility and transport infrastructure planning.

Other important research activities analyse regional development with an emphasis on innovation as a driving force. On the one hand, technical and economic innovation is viewed as an essential determinant of regional development, whereby it is clearly evident that there are sizeable regional differences with regard to the emergence and application of new products and technologies. Capital resources, levels of qualification, economic structures, and institutional framework conditions play an essential role in the innovation output of a region. On the other hand, projects such as PLAISIR analyse the conditions under which socially innovative energy projects emerge and are implemented in structurally weak regions. This research initiative thus addresses the research gap at the interface between the notion of endogenous regional development, which is oriented towards social capital, and spatial energy planning, which is rather oriented towards resources. Finally, within the tradition of regional science research, questions surrounding regional disparities are also to be found. In particular, the SRF analyses and assesses the effectiveness of European cohesion policy in terms of its outreach accuracy and the spatial effects of support strategies and measures, as well as in terms of socio-economic and regional convergence.

The main challenges

Mobility research is becoming increasingly important in the face of a wide range of crises (climate change, congested transport infrastructures, urban sprawl, land scarcity, etc.). In this domain, the demand for high-quality planning with regard to acceptance, frequency, and security can be satisfied through the use of new data sources which, as a result of the digital transformation, can also be accessed for mobility research purposes. Against the background of an understanding of space in terms of social relations that not only aims to look at individual interactions, but at the totality of urban transport systems, the explanatory power of conventional data is often limited for various reasons (data granularity, etc.). In contrast, user-generated georeferenced motion data (social mapping and tracing), for example, offer the opportunity to obtain large samples of observed behaviour over a long period of time and, thus, to better understand spatial and surface phenomena.

Although spatial and temporal factors have been relativized by modern information and communication technologies, technical innovations continue to have a significant impact on social polarisation and spatial disparities. Not only do these trends affect regions in the new European Union member states of Central and Eastern Europe, they also constitute a major challenge for the entire European integration process and, also for individual member states. Climate change, pandemics or the economy: these further reinforce the above trends.

Against this background, a wide range of regional development research topics is opening up which, in the future, will continue to be dealt with thoroughly at the SRF. For example, the question arises as to the significance that technical, social, or open innovations might have for regional development, and the extent to which they might be able to aid planning (for example, in

participatory decision-making) to overcome crises. In this context, one should even ponder whether sustainable and resilient development, in the face of climate change and other global challenges, should not be entirely redefined. In any case, urban and regional research will have to grapple with the types of measures and strategic approaches that would be needed in order to effectively address two major challenges: social polarisation and regional disparities — both within nation-states and between EU member countries.

5. CONCLUSION

As part of the Institute of Spatial Planning at the TU Wien, the research unit has determined its research activities within the three priorities described above; these, however, are strongly linked in terms of content and methodology, and should therefore be viewed in their interrelations. In any case, a glance at the scientific publications and projects of recent years reveals some common features of all SRF research priorities:

- the theoretical embedding of empirical work to a greater or lesser extent,
- the requirement for high standards as regards suitable methodologies based on a complex understanding of space,
- the use of mainly quantitative methods and GIS tools for the processing of statistical information in 'container format' or of georeferenced information about given objects in space,
- as well as the increasing triangulation of quantitative and qualitative methods based on an understanding of space in terms of both functions and social relations.

Despite the specialisation of SRF researchers, research activities are usually set up in a highly interdisciplinary way. The professional growth of individual members and of their research interests has therefore led to a degree of heterogeneity of research projects in recent years, but this was also a prerequisite for strong individual commitment and productive contributions to interdisciplinary or transdisciplinary work. All research activities share the same endeavour: to achieve an understandable and transparent argumentation based on a clear theoretical understanding and a well-founded methodological treatment as essential prerequisites for intersubjectively understandable research results.

Research at the SRF is not an end in itself. In terms of content, all research activities are characterised by an effort to achieve a clear problem orientation and socio-political relevance. This is the best basis for research-led teaching, which is organised in didactically clearly structured courses on theories and methods. The clear aspiration of the SRF teaching staff is to convey theoretical and methodological foundations to students, on the one hand, and enable problem-oriented learning by using examples, on the other hand. In our opinion, it is only by following the aspirations of research-led teaching that theory and practice can be brought together and, through mutual critical learning processes, an evidence-based understanding of planning can be made palpable.

In particular, the vastly improved conditions for the production and provision of information and knowledge, as well as for the rapid processing and real-time communication of data and information, pose a major challenge for spatial planning-oriented research. Digitisation processes are massively changing lifestyles, social milieus, and spatial interdependence patterns, while leading to new challenges that require targeted and empirically based strategic planning intervention. It is precisely because of the speed and dynamics of these trends and transformation processes that theoretically and methodologically rigorous research on spatial development issues seems more than ever essential if we are to ensure the sustainable and resilient development of our cities and regions.

OVERVIEW: PROJECTS, AND PUBLICATIONS AT THE SRF

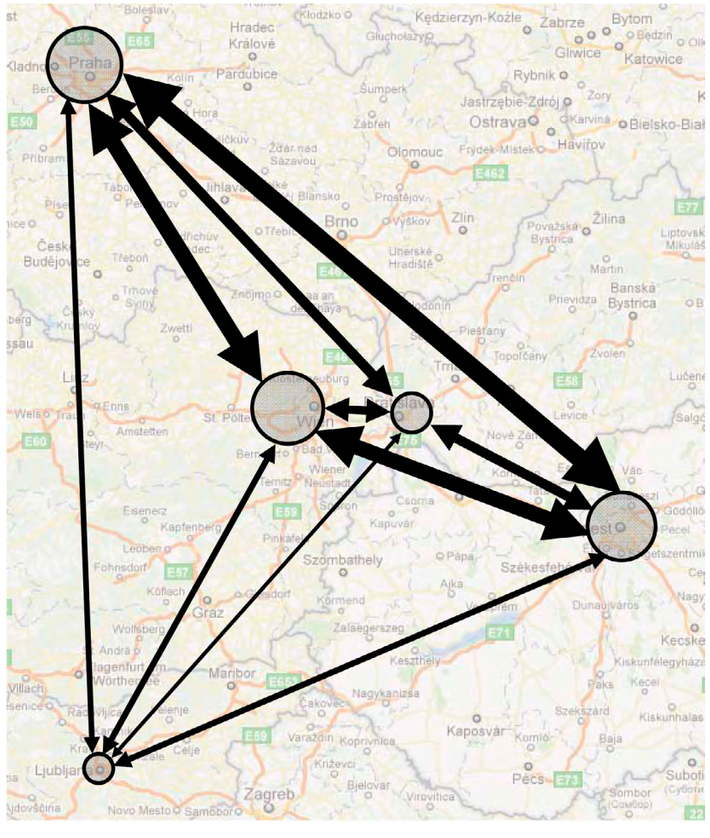
A full overview of publications by SRF staff can be found in the publication database of the TU Wien at: https://repositum.tuwien.at/cris/ou/ou00052

POLYCE

Metropolisation and Polycentric Development in Central Europe — Evidence -Based Strategic Options (2010–2012)

Edited by: Giffinger R., Suitner J., Kadi J., Kramar H. & Hackl R.

Project partners: University of Ljubljana, Slovak University of Technology in Bratislava, University of Szeged, Czech Technical University in Prague, University Prague & CEPS/INSTEAD, Milano Polytechnic.

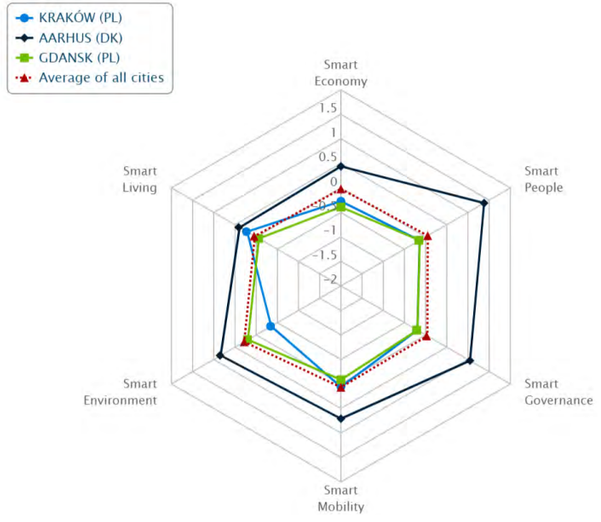


active8

Efficiently promoting active travel (2015–2019)

Edited by: Kramar H., Kalasek R. & Soteropoulos A.

Project partners: TBW Research, Research & Data Competence, Herry Verkehrsanalyse Beratung Forschung.



City profiles: Kraków (PL), Aarhus (DK), Gdansk (PL)

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EUROPEAN SMART CITIES

>> www.smart-cities.eu

Graz Smart City

Positioning of Graz as a Smart City (2008–2009)

Edited by: Giffinger R., Kramar H., Fertner Ch. & Kalasek R.

Project partners: Department of Geography, University of Ljubljana, OTB Research Unit for Housing, Urban and Mobility Studies, TU Delft.
>> www.smart-cities.eu

PLEEC

for Planning Energy Efficient Cities

Edited by: Giffinger R., Strohmayer F. & Haindlmaier G.

Project partners: Eskilstuna Energi Och Miljo Ab; the cities of Eskilstuna, Jyväskylä, Turku, Tartu, Stoke-On-Trent, and Santiago de Compostela, and various universities.
>> cordis.europa.eu/projectid/314704/en

Smart KOM Krakow

Positioning Krakow as a smart city region (2014–2015)

Edited by: Giffinger R. & Strohmayer F.
>> www.smart-cities.eu eu-cid=01&ver=4

‘Our research results enrich planning science and economic policy theory along evidence-based lines, that is to say, above all, by building on a broad theoretical foundation and empirical (i.e., in particular, information and data-driven) quantitative research. Rapid technological progress and the dissemination of new forms of economic organisation influence economic, social, and spatial developments.‘

IFIP RESEARCHERS' COLLECTIVE

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ON THE FOUNDATIONS OF PLANNING: PUBLIC FINANCE, INFRASTRUCTURE ECONOMICS AND ECONOMIC POLICY

PUBLIC FINANCE AND INFRASTRUCTURE POLICY RESEARCH UNIT

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1. INTRODUCTION: ECONOMIC PERSPECTIVES ON PLANNING IN THE WELFARE STATE

The Institute of Public Finance and Infrastructure Policy (IFIP) was founded in 1972 as one of the first institutes in the academic field of spatial planning. Egon Matzner, together with his team (whose staffing was completed in the 1970s), in particular Wilfried Schönbäck, Wolfgang Blaas and Gerhard Rüsch, was the first full professor to develop a number of theoretical strands that, to this day, have significantly shaped the economic discourse on the necessity, effectiveness, limitations and, also, the failures of planning, in particular, of spatial and infrastructure planning (cf. Schönbäck et al., 2008; Blaas & Henseler, 1978).

The ‘functional analysis of the public sector’ is based on modern government objectives and the ways to implement these objectives, for example in the shape of ‘outcome-based budgeting’, recently implemented at all levels of government. These goals have developed over the past fifty years and can be described in the broadest sense by the following notions: economic efficiency; social balance and fairness (participation and acceptance); environmental sustainability; technical functionality and future-oriented technological development; and cultural diversity. Hence economic research at the research unit is understood along multidisciplinary and interdisciplinary lines or, where necessary and meaningful, transdisciplinary ones, for example by taking into account the foundations in technical terms of the natural sciences or the institutional framework conditions of economic processes as proposed by heterodox approaches.

If a company (or the state) accepts the stated objectives as desirable, the failure of individual decisions (also in the sense of market decisions with regard to supply and demand) will initially result in a series of reasons for state intervention and, thus, in concrete terms, will also provide the theoretical basis for spatial planning. The question of why a planning state is needed, also in terms of guidance, is dealt with, amongst other things, by normative theories regarding the resolution of market failures (Schönbäck, 1980; Matzner, 1984).

However, market failures, understood as the inefficiency of individual decisions alone, are not sufficient to fully understand the economic foundations of planning. Even in the eventuality of rational and efficient individual decisions, it will be the task of the state, and thus also planning, to ensure a fair distribution of incomes, wealth, individual risks, and opportunities for participation. Of course, what is considered fair is subject to democratic elections and social negotiation processes time after time. One thing, however, is essential if we wish to understand the basic research approach of the research unit: market decisions (i.e. the many individual decisions) may well be efficient, but in the vast majority of cases they are not consistent with the equity-related considerations addressed here. Only

THANKS A LOT!

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the state can ensure equity through the appropriate instruments, including the welfare state.

However, functional analysis also involves the examination of at least three other functions: stabilizing business cycles, and thus avoiding unemployment and other macroeconomic imbalances, which are also functions of the public sector; long-term coordination (e.g. spatial development or climate policies); and the guarantee and further development of fundamental rights and freedoms — although mentioned last, this is perhaps the most fundamental function of the state.

These basic state functions within functional analysis also correspond to conceptions of the 'welfare state' that have been further developed at IFIP, in particular with regard to ensuring equity. In principle, this conception of the welfare state does not assume that 'the state' must (or should) regulate all areas of life or intervene in all individual decisions. Rather, it involves an extremely nuanced view of the state:

a) The state does not constitute a monolithic block, but is divided into various levels of government (in particular, according to economic subsidiarity and federalism theories).
b) The state does not only operate through official action; rather, it deploys its activities in the most varied ways, through a wide variety of instruments, and also through various organisations.
c) The special recognition and appreciation for private activities and decisions, in particular nonprofit-oriented ones, is also essential for the fulfilment of public tasks, as well as the acknowledgement of commercial activities that are important for prosperity, along with their driving forces, which can also be exploited by public action.
d) Public policy instruments for the many sectors of the state are to be applied in a differentiated manner, inter alia with regard to their binding effect on the behaviour of people and companies (e.g. regulatory instruments such as the prescription or prohibition of certain actions, market-based stimulus instruments for the exploitation of economic incentives, and macroeconomic cost savings for the achievement of political objectives, all the way to process, information, and communication instruments).

The conception of the welfare state has faced a number of challenges of a theoretical, methodical and, also, political (e.g. neoliberal) nature (Getzner, 2008), especially in recent years. Research conducted at IFIP has taken up this challenge, amongst other things, by researching state failures in a variety of ways and also by critically questioning instruments and their effects on an ongoing basis. In addition, the performance of government tasks, for example as in regard to the provision of infrastructure, has been assessed in a nuanced manner, inter alia with respect to the responsibilities for tasks, expenditure, and financing borne by local authorities and to various possible organisational forms (cf. Bröthaler et al., 2012).

In addition to these fundamental considerations concerning the roles and tasks of the state, the research unit has dealt with theoretical, methodical, and empirical research questions in various research fields:

- **Public finance:** Analysis and forecasting of government budgets; federalism; revenue sharing; and regulatory and funding instruments.
- **Infrastructure economics and policy:** Market analysis and regulation in the transport, energy, water and sanitation, waste, telecommunications, and social and health service sectors; digital platforms and their effects and regulation.
- **Resource and environmental economics:** Economic assessment of natural resources consumption and of the environmental dimensions of economic processes; valuation of ecosystem services; and appraisal of climate protection and adaptation measures.
- **Housing policy and real estate economics:** Economic analysis of land and real estate activities in their urban, regional, and national economic dimensions; land and housing policy; housing and real estate-related social and spatial inequality.
- **Urban and regional economics:** Sectoral, regional, and local economic analysis and policy; spatial distribution of economic activities.
- **Software and method development:** Subject-specific software, modelling, and information systems in public finance and several infrastructure sectors, and e-government.

In line with these fundamental perspectives, a number of existing and future challenges for economic research will be outlined below; by tackling these, an important contribution to spatial development and spatial planning research can be made in support of evidence-based policies.

2. PUBLIC FINANCE RESEARCH FOR SPATIAL PLANNING: BUDGET ANALYSIS AND MODELLING, FEDERALISM, REVENUE SHARING, AND THE COSTS AND BENEFITS OF PUBLIC SCHEMES

Since the foundation of the institute, both public finance and financial economics research at the research unit have always had a spatial and functional orientation that differentiates between the different levels of government. Besides 'classical' public finance research issues, such as the economic examination of government revenues and expenditures (e.g. determining factors for municipal expenditures for certain infrastructure sectors), specific spatial determinants and their importance for spatial planning have received particular attention.

Until now, the research unit has therefore mainly concentrated on the following research domains, and will continue to do so in future (e.g. Bröthaler & Getzner, 2011; Bröthaler et al., 2014; Mitterer et al., 2016):

- The significance of autonomy and of the decentralisation of government revenue and expenditure for the state's claims for resources;
- Efficiency conditions for revenue-sharing instruments and strategies in a federal system of accountability for public tasks, revenue, and expenditure;
- Modelling of government revenue and expenditure, as well as their allocation to the specific (levels of) local authorities;
- The sustainability of local authorities' fiscal policies, in particular those of the *Länder* and municipalities (cities);

- Spatial dependencies of public service and expenditure policy;
- Regional supply functions and the design of revenue-sharing policy instruments (e.g. task orientation of revenue-sharing);
- Effects of spatial planning and infrastructure decisions on overall and regional economic efficiency, as well as social distribution of costs and benefits.

Simulations of the Austrian revenue-sharing system (SimFag), which have been further developed at the research unit for almost three decades, and the creditworthiness of municipalities, which underpins an exhaustive database of municipal revenues and expenditures as regards various budget items (GemBon), provide the methodological and empirical foundations for diverse public finance analyses.

In future, the above-mentioned issues will be supplemented in a multi-faceted theoretical and empirical perspective.

(1) Intermunicipal dependencies in fiscal policy can be taken into account, which complements traditional public finance analysis, by means of spatial econometrics based on GIS-based analysis. Taking centre stage is the extent to which various municipal infrastructure expenditures depend on the position and location of a given municipality (e.g. regional supply function; urban or rural location; cities and conurbations), but also on whether and to what extent the expenditures of a given municipality are determined by those of the neighbouring municipality or of the entire region. In this regard, one methodological approach consists in weighting the expenditures of municipalities within a certain distance, for example on the basis of a distance matrix.

The basic idea to be examined here is the following: planning and coordination are based on the notion that it pays off for an individual to take the interests of others into account regardless of the existence of a direct relationship with others. Let us take a simple example: as an individual, I am friendly to my fellow human beings — regardless of whether I expect a direct 'return' from those towards whom I am friendly. Yet I am contributing to human coexistence, and other people will be friendly towards me. Might this expectation also apply to local decision-makers? Let us assume that a municipality decides to build an infrastructural facility (e.g. a swimming pool or a cultural and events centre) not only for its own citizens, but for the entire region. Then this municipality would expect other municipalities to follow suit and create other infrastructure facilities. Thus, presumably, apart from some relatively frugal communication, there would be no need for further planning steps in terms of intercommunal solidarity or, even better, intercommunal reciprocity. On the one hand, such an approach reduces transaction costs by eliminating the need for complicated revenue-sharing allocation mechanisms (either task or burden-oriented) or comprehensive regional planning. The prerequisites for this would be a basic trust level and — from a theoretical point of view — a rejection of narrow economic rationality. Thus, the phenomenon of free-riding in the production of regional public goods and services would not be an issue. The economic notion of 'club goods' would also lose some significance as the basis for the economic theory of federalism.

Empirical checks as regards this briefly sketched 'intercommunal solidarity' thesis are currently lacking. For example, an Austria-wide distance matrix has only recently become available; it could systematically record the proximity of municipalities to one another and take this into account in spatial econometrics approaches.

(2) In conjunction with future infrastructure policy related to social and climate policy requirements, an important further research strand consists in the discussion of 'inducing solidarity', that is to say, the further development and deepening of the welfare state, which would entail a changed interpretation of the rules on the sustainability of budgetary policies. For one thing, it should be noted that the sustainability of public finances can only be viewed in a broad perspective with regard to revenues and expenditures; implicit (future) claims and liabilities of the state; and the many challenges from a social standpoint. On the other hand, a purely formal interpretation of fiscal rules leads to an aggravation of economic, social, and societal shocks, especially in times of crises (e.g. COVID-19 pandemic caused by SARS-CoV-2; climate crisis and the enormous challenges involved in preventing and managing it). Overall, the resilience of infrastructure and public finance appears to be significantly higher in Central European or Scandinavian welfare states. High public spending ratios are therefore unlikely to be an expression of public inefficiency. In particular, in the light of the two crises mentioned above (short and long-term, respectively), the resilience and evolution of the welfare state — including solidarity-based protection systems, strong public governance, and effective regulation — cannot be overestimated. Perhaps we may speak here of a certain 'efficient redundancy' if — contradicting some national and international evaluations — a certain degree of overcapacity makes infrastructure systems much more crisis-proof.

(3) Basic and fundamental research remains an essential cornerstone of the research unit. For instance, let us sketch the economic viewpoint and assessment of costs and benefits in relation to projects, programmes, and policies. The standardised assessments currently used for many infrastructure schemes do not correspond to the state of the art in technology or science. In transport planning and, also, in the social, open space or health policy sectors, assessment criteria for human health (e.g. heat-related diseases or statistical deaths), scarcity of time (e.g. opportunity costs of time) or environmental resources that are used are often many years, if not decades old. More recent methodological approaches to benefit-cost analysis for the assessment of these effects have hardly been applied in Austria. This results in a broad field of research, which has been explored, for example, by Baron and Getzner (2022) by means of a choice experiment as regards the willingness of private households to pay for the reduction of greenhouse gas emissions (GHG emissions). It turns out that the average willingness to

pay — in the order of around €180 per tonne — is significantly higher than the current average pricing of GHG emissions; this shows how much leeway climate and energy policy currently are enjoying (but not using) and, also, that the currently assumed damage costs of €50 per tonne in the relevant assessment guidelines of the BMVIT [Federal Ministry of Transport, Infrastructure & Technology] (RVS, 2010) are far from the actual damage costs or willingness to pay.

(4) Since the beginning of research work at the IFIP in 1972, scientific studies and proposals for the reform and more efficient and fairer design of revenue sharing have been carried out (e.g. Matzner, 1977; Bröthaler et al., 2006; Bröthaler et al., 2012; Bröthaler & Getzner, 2017). From a public finance point of view, a series of empirical research questions have arisen from many theoretical developments:

- The revenue-sharing system as a solidarity-based liability system or insurance, with consequences in terms of moral hazard;
- the room for manoeuvre of local decision-makers with regard to the efficiency and fairness of budgetary and financial policy;
- urbanisation and contradictions between urban and rural regions with regard to public services (e.g. infrastructure provision in increasingly peripheral regions).

3. THE ECONOMICS OF EVERYDAY LIFE: REFLECTIONS ON ESSENTIAL PUBLIC SERVICES AND INFRASTRUCTURE POLICY

As described above, the welfare state, essential public services, and infrastructures are well-established research fields at the research unit. The Foundational Economy research approach — by analogy also named 'economics of everyday life' — can primarily be assigned to this strand (Foundational Economy Collective, 2019). This is because the foundational economy encompasses broad areas of essential public services that are organised either into network or point infrastructures. In addition to these public goods, which are often provided by the state, some private goods also fall into this basic economy — above all the supply of food, repair and banking services, which are usually paid for out of personal (market-based) incomes.

Even if, at first glance, these economic activities follow different economic logics (e.g. profit vs. common good orientation), what unites them is their 'foundational' importance for a functioning economy. Beyond this, the Foundational Economy also has an economic ethics component, because it is the translation of the abstract idea of 'The Good Life for All' (Novy, 2013) into our societies' practices. The demarcation line is necessarily blurred because it is subject to historical change: what was previously a luxury reserved for the few, such as care for the elderly, has become a legal entitlement for all citizens over the past decades. In addition, this is also a socio-political task, because the construction of the everyday economy puts the spotlight on those economic activities that offer an essential contribution to coping with everyday life. When we talk about economic processes and bring them to the

fore, this makes them visible — as were the 'heroes of everyday life' during the COVID-19 crisis in 2020. In many countries, the latter made painfully visible the fundamental importance — as well as the structural neglect — of this foundational economy far beyond academic circles.

In terms of the history of ideas, the Foundational Economy approach is rooted in the innovative combination of existing heterodox theoretical traditions, as Colin Crouch noted in the foreword to the original English edition of his book, 'Foundational Economy — The Infrastructure of Everyday Life' (Crouch, 2018). Its most important point of reference is the work of Fernand Braudel, the French historian, who traced a precise structural history of the economy and society in *Civilization and Capitalism, 15th–18th Century*. He distinguished between three spheres or zones of the economy: the market economy, the infra economy, and the supra economy. The supra economy featured a small elite that organised international trade. In contrast, most people contended with everyday life in the infra economy, which operated according to different principles. Here, production and consumption mainly took place as part of self-sufficiency or the local supply. It is with this infra economy that the Foundational Economy project connects itself — under the changed historical conditions of the 21st century.

While scientific and political discussions traditionally feature the issue of the role of the state or the market in the provision of essential public services and of infrastructure, the economics of everyday life shift the emphasis. The focus lies not so much on formal ownership, but on the organisational and business models that are appropriate for this type of basic economy and its diverse social objectives. Financialised models based on extractive values are considered inappropriate for essentially durable and low-risk infrastructures (Getzner et al., 2018). Instead, the aim is to strengthen and further develop institutionally diverse models oriented towards the common good (Plank, 2020). The state should by no means always automatically act as a direct service provider itself — even if this is likely to make sense for society as a whole as regards many types of infrastructure. However, in all aspects of the economics of everyday life, at least one central regulatory responsibility lies with public authorities who, beyond this, can also promote the 'foundational economy' through other instruments. By way of example, reference may be made here to the municipality of Stanz im Mürztal, which innovatively designed a competitive tender amongst supermarkets not only to secure local food retailing operations but also obtain high regional added value in the product range (Pölser, 2020). The example illustrates another central idea: the 'social license to operate', that is, a kind of social operating license that is granted to a company if it is allowed to service the local market, which is largely protected from competition. In return for granting this privilege (often a temporary monopoly), a corresponding service in return is expected, which must be negotiated democratically.

Overall, the idea of the foundational economy implies an extension of public regulatory responsibility to these elementary economic activity zones. In this context, the state is called upon to pursue 'experimental governance' (Morgan, 2019), under which it must also test new forms of cooperation

with companies, cooperatives, and grassroots initiatives that differ significantly from public-private partnerships of the past (Plank, 2016). Some ideas concerning Vienna can be found in a recent issue of the *Kurswechsel* magazine [in English: Change of Course] bearing the title: *Wien: ein Modell im Zukunftstest* [Vienna: future-testing a model] (Hamedinger et al., 2020).

The founder of the IFIP institute, Egon Matzner, would probably have been an advocate of this research approach, especially since some fundamental parallels to his position and attitude have emerged, such as: paying attention to the various potentials of individual types of actors, not least the 'autonomous' sector; a fundamentally socio-economic attitude; and an understanding of science that not only encompasses Musil's 'sense of reality', but also his 'sense of possibility' (Schönbäck, 2003). Thus, he was by no means satisfied with the role of a descriptive scientist lacking any commitment to improving people's living conditions. Matzner might well have added more to the following list of starting points for future planning-related agendas:

- Development of spatially differentiated alternative indicators of basic well-being, for instance: residual household income, which deducts the unavoidable expenditure on housing, transport, and energy from disposable income.
- Further advancement of location-based development strategies, in particular by involving strategic public procurement and local anchor institutions, as well as of the required methodological expansion of assessment procedures.
- Reassessment of real estate upgrading strategies in the light of alternative uses in the public interest.
- Sector-specific further development of existing models (e.g. municipal utilities and inter-municipal cooperation) as well as a strengthening of responsible ownership and non-governmental intermediaries (e.g. in line with not-for-profit housing).
- Transdisciplinary research on hybrid alliances for fundamental change and further development of democratic participatory processes that prevent social selectivity.

4. NEW INFRASTRUCTURE POLICY CONCEPTIONS

Besides the discussion about expanding the notion of infrastructure to new forms of infrastructure (e.g. the platform economy or cloud infrastructure, see Gutheil-Knopp-Kirchwald, 2012), current research also often draws on a 'constructivist' perspective, which views infrastructures related to essential public services or the foundational economy as structuring in a social and spatial sense. Indeed, infrastructures may be construed as social structuring elements in society and space, both from a micro perspective — how infrastructures influence the occurrence and characteristics of certain actions (e.g. how smartphones and apps influence communication and mobility in cities) — and a macro perspective — how infrastructures are embedded in social discourse (e.g. how planning paradigms and guiding principles influence the form and existence of infrastructures) (Barlösius, 2019; Müller et al., 2017). By examining infrastructures and their embedding in social structures over a certain period of time, we are above all able to make the connections between social, economic, and political transformations understandable. Technological innovations, for example, show that infrastructures function as a way to reproduce social conditions for the production of a given type of society (e.g. capitalist society) (Soja, 1989).

In all these discussions, infrastructure is seen as a relational concept, 'becoming real infrastructure in relation to organized practices' (Star, 1999, p. 380). Larkin (2013) also understands infrastructures as 'built networks that facilitate the flow of goods, people and ideas and allow for their exchange over space' (p. 328), whereby, in contrast to Star (1999), he explicitly refers to the spatial aspect. This relational approach differs from traditional economic and political science definitions of infrastructure, which essentially focused on the economic functions of infrastructure systems. Thus, the relational approach understands infrastructures, in the sense of essential public services, as the basis for the material, social, and symbolic structures and processes of society. This also means that the centre of attention shifts towards power structures inscribed in infrastructures, (re)produced social inequalities, the latter's symbolic effectiveness, and various constellations of actors (Müller et al., 2017). Thus, for example, the organisational forms of the water supply and the regulation of user access to the network, along with the charging structure, give rise to a particular water supply system that reflects social (power) structures. The same applies, to give another example, in the childcare sector: providers, opening hours, the level of training of caregivers, access, and contributions to costs are all an expression of social values.

Accordingly, infrastructures are particularly suitable for the analysis of social structures, since they always imply an anticipation of possible 'futures' and carry certain ideas and expectations of developments. They are also particularly suitable in the planning sciences, not only to explore future developments but, also, by reference to infrastructure planning and development, to comprehend development dynamics retrospectively in all their economic, political, social, and cultural facets. For example, we can trace back a certain type of spatial development across several, more or less stable phases to a variety of planning ideas, discourses, and institutional framework conditions by observing infrastructure development in Vienna's northeast over the period of the past seventy years; this enables us to make claims about the effectiveness of Vienna's urban policy and planning (Krisch & Suitner, 2020).

Moreover, social and cultural infrastructures also constitute interesting fields of research for planning science: time and again, they show that they provide inputs for the economy and social integration, both directly and indirectly (Barlösius, 2019). In particular, cultural infrastructure provides a basis for sociomaterial structures in the city (Klinenberg, 2018; McFarlane & Silver, 2017). Conceptualised as a social infrastructure, and together with the technical infrastructure, it forms the fundamental configuration of the economy and society, fairness, quality of life, and social well-being, while symbolising specific normative collective values and the cultural meanings of a specific period of time (Krisch & Hiltgartner, 2019). It is evident, especially in Vienna, that cultural infrastructure plays a particularly structuring role in the organisation of space

and society, in that it decisively influenced the image of the city, and has been safeguarded — both discursively and institutionally — by the planning policy of recent decades (Krisch, 2019).

Infrastructures are thus to be understood in their complexity in a more all-embracing way as an interplay of social, cultural, technical, political, and economic conditions. Depending on one's research interest and approach, the political, economic, physical or semantic aspects of infrastructure systems will be at the heart of the analysis.

5. SOCIO-SPATIAL INEQUALITIES AND SOCIAL INFRASTRUCTURE

The state also takes action to reduce inequalities within its boundaries. However, new social risks (Taylor-Gooby, 2004), current global crises, and general fiscal consolidation continue to put pressure on European welfare states. In this respect, several topics have been at the centre of both the academic and political debates. First, there is little consensus about the 'right' instrument for inequality reduction. While monetary transfers are a commonplace approach utilised by welfare states to equalise national income distribution, there has been a general trend towards the provision of social services over the past two decades. This *social investment* perspective stresses that welfare states should move away from pure cash transfers and, instead, focus on risk prevention, for instance through an active unemployment policy or education policy, to decrease dependency in the long term (Morel & Palier, 2011). Social investment hence represents a restructuring of social policies in line with the rise of the knowledge-based and service economy. However, critics of this approach argue that it overemphasises the economic logic perpetuating the commodification of social policies (e.g. 'any job is better than no job') (Hemerijck, 2015). Despite this criticism, the rise of austerity measures has led to a further reorientation of the welfare state, in particular regarding the scope of social policies. Accordingly, social policies can either target specific vulnerable groups (e.g. the unemployed) or the general population. In many welfare states, such as Austria, we find a mix of universal and targeted measures (e.g. child benefits and needs-based minimum benefit [*Mindestsicherung*], respectively). While universal benefits are easier to administer and are often seen as 'morally more acceptable', it has also been argued that they are financially unsustainable and less effective in terms of vertical redistribution. In contrast, targeted benefits are said to reallocate resources more efficiently while, on the other hand, being overly bureaucratic and stigmatising (Rothstein, 2012).

Last, the question arises as to which administrative level should assume responsibility for the alleviation of inequalities. Proponents of social policy decentralisation argue that shifting responsibilities from the national level to provinces or municipalities is more efficient because lower administrative levels are better at assessing local needs. It is further argued that this localised 'model of governance' (Pierre 1999) is more democratic since local government is closer to civil society and hence is able to mediate between central government and local residents. Yet the decentralisation of social policies may also lead to a wasteful use of resources, corruption, and lower service quality (Diaz-Serrano & Rodríguez-Pose, 2015).

It should be noted that all these policies, and how they are implemented, influence the spatial and regional distribution of inequalities. Some local authorities may not have sufficient capacities to counter inequalities and the quality of social services may differ vastly across municipalities. Hence decentralised social policy may exacerbate regional inequalities.

A somewhat alternative approach to traditional social policy, which complements the above-mentioned instruments, is public investment in social infrastructure (SI) to achieve equality of opportunity for all. While the term 'social infrastructure' is a buzzword heavily used in recent policy documents and statements (see e.g. Stadt Berlin, 2022, or Stadt Graz, 2020), it is still ill-defined (Breckner, 2020). Usually, it is used to describe a variety of physical spaces, services, and processes that aim to enhance social welfare, cohesion, participation, and personal quality of life. SI is part of the general infrastructure (but distinct from technical infrastructure) whose objective is the economic development of regions and, more generally, overcoming physical distances through transport and communication.

Schmidt and Monstadt (2018) regard SI, together with parts of the technical infrastructure and the social security system, as a building block of a welfare state's essential public services (i.e. *Daseinsvorsorge*). Additionally, research from the US also emphasises the function of SI as a shared space where people from different backgrounds regularly meet and interact, such as libraries and playgrounds and, also, religious facilities (Klinenberg, 2018). While an agreed definition does not exist, several domains are regularly mentioned as an integral part of SI: health, education, culture, and social services, as well as sports and recreation. How to optimally distribute, finance, and operate the relevant facilities and services in order to yield the expected social and individual benefits is the focus of a rather newly established field: social infrastructure research. The field is inherently interdisciplinary since it builds upon, and combines methodological approaches found in economics, sociology, regional science, human geography, and spatial planning.

6. NEW INFRASTRUCTURES: REGULATING THE PLATFORM ECONOMY

In recent years, internet platforms have not only gained in importance in our everyday lives, but have also established themselves as a controversial field of research. Large platforms such as Google, Facebook or Amazon are particularly challenging as regards welfare state issues. In 2018, The Economist magazine described these 'tech titans' as 'BAADD — big, anti-competitive, addictive and destructive to democracy' (The Economist, 2018) and thus came straight to the point of the economic and political relevance of these platforms. From an economic perspective, Google, Facebook and Amazon are now the largest and financially strongest companies in the world in their respective business areas; as measured by their market capitalisation, they have even overtaken companies in the 'old economy' such as ExxonMobil (Bellak & Reiner, 2018; PWC, 2017). Beside traditional business segments, the platforms are also driving horizontal and vertical expansion, including in the cloud services business segment (Srnicek, 2017). Underwater internet cables are also increasingly provided by internet platforms. These dynamics have led to a growing

trend towards the concentration of internet platforms, which makes them increasingly powerful from both an economic and a political point of view.

This concentration of power can be traced back to various mechanisms, which also feature in classic infrastructure systems: network, scale, and lock-in effects (Clement & Schreiber, 2016). In particular, network effects are characteristic of the business models of internet platforms. Here, platform benefits increase proportionally to the size of the network. Additional platform users generate positive external effects for all existing users, for example easier access to social media platforms. Besides network effects, platforms also benefit from economies of scale. Digital platforms often feature a cost structure with relatively high fixed costs and comparatively low variable costs. For example, the development of databases is associated with relatively high fixed costs, whereas individual transactions based on them entail hardly any additional costs. Thus, average costs for the platforms decrease as the number of transactions increases, which often leads to the fact that it appears to make more sense for the economy as a whole for a single provider to operate on the market, thus promoting the trend towards monopoly formation. The lock-in effects of the platform structures ultimately lead to users being tied to a given system inasmuch as platforms are increasingly integrated into everyday activities, which makes it more difficult to move to other systems. This results in high switching costs, which can be either financial (e.g. access or registration fees) or immaterial (e.g. time expenditure or learning effort). Owing to these mechanisms, large internet platforms often invest in their own technical and logistical infrastructure, as the examples of cloud services or underwater internet cables show, in order for these strategic investments to make it as difficult as possible for new market participants to enter the market.

In addition to these economic mechanisms to retain market power, political and institutional barriers to entry also play a central role. These include, in particular, attempts to influence the regulatory debate through various channels and to secure power through strategies such as lobbying, party donations or the 'revolving doors' mechanism (e.g. regulatory capture).

Media reports in recent years have shown that this economic and political power, along with growing trends towards monopolisation, is problematic. The list of allegations is long: from abuse of market power by favouring one's own platform services (*Bundeskartellamt* [Federal Cartel Office] 2018) to gigantic data collection strategies (Der Standard, 2018) and seeking to influence public opinion formation (Brodnig, 2013, 2016). Another problem is that the economic and political powers of these large internet platforms mutually reinforce each other, thus forming a 'Medici vicious circle' (Zingales, 2017), which must be broken up through regulation. In this regard, the public sector has an important role to play at various administrative levels. At the European level, regulatory approaches are being sought that deliberately contrast with the US and Chinese models: they are based on the notion of digital humanism in line with Enlightenment values (Der Standard, 2019). This orientation revolves around putting people at the centre of the debate on regulatory issues. This is also where the notion of infrastructures that structure societies in a social and spatial sense comes in (Barlösius, 2019). For

platforms may be viewed as infrastructures through their dominance both in the socio-political and economic contexts (Krisch & Plank, 2018). As a result, they have become a new essential public services sector; hence existing regulatory options and instruments may be transferred to internet platforms — viewed as new infrastructure systems.

Besides regulation under competition law, a new 'Law & Economics' movement has emerged in the USA in recent years; it aims to introduce sector-specific 'public utility' regulation in order to place powerful private infrastructure companies under stricter state control in order to ensure non-discriminatory and affordable access to the services of these companies (Clifton et al., 2011). Proposed measures range from separation between various business areas of the platforms, and ensuring data portability and interoperability, to implementing concepts such as 'search neutrality', based on net neutrality. However, there have also been renewed calls for a closer integration of related legal matters, such as media law or data and consumer protection.

Besides the supranational level, the urban level is also playing an increasingly important role in regulatory issues concerning internet platforms. Here, the main task of the public sector is to act in the spirit of essential public services and develop an alternative logic of data collection and extraction. Examples can be found in the cities of Barcelona, which has developed its own data sovereignty strategy, and Vienna, which has developed its own mobility platform to provide an alternative to Google's mobility data within its own sphere of activity.

7. HOUSING POLICY AND REAL ESTATE ECONOMICS

This branch of research involves a nuanced examination of the instruments and actors of housing policy, and their embedding in prevailing economic, political, and social structures, as well as their effects on the housing market (e.g. price trend, market segmentation), housing provision (especially affordability and access), and related social and spatial inequalities (e.g. segregation or gentrification). The spatial focus lies mainly on Austria and Vienna, although international (comparative) studies are increasingly being carried out.

Relevance for the IFIP stems from the role of housing in the welfare state. In the 20th century, in addition to health and education, housing emerged as a pillar of Western European welfare states and, thus, as an essential public services domain (Kemeny, 1995). Although traditional social policy literature originally did not consider housing separately (cf. Esping-Andersen, 1990), there is now a broad consensus on the important role played by housing policy in this context (Harloe, 1995; Matznetter & Mundt, 2012; Ronald et al., 2017).

From the point of view of public finance, state intervention in the housing market is based on the peculiarities of real estate (including immovability, heterogeneity, lack of substitutability, high transaction costs, high financing costs, and scarcity of land), which lead to market failure and inefficient resource allocation. In addition, a housing market run by the private sector fails to provide housing for lower income groups, which is viewed as a central reason for state intervention in the name of the state's role in ensuring equity (Brezina & Blaas, 1991).

From an empirical point of view, housing markets are particularly strongly shaped by state regulation in comparison with other markets (Doling, 1999), although concrete forms of state intervention vary greatly between countries (and cities) (Balchin, 1996; Donner, 2000).[1] From a conceptual point of view, this means that a purely economic perspective on housing markets is insufficient to explain their functioning (or failure) and related effects, and that an integrated approach to land, housing policy, and the housing market is called for.

At the moment, research (both internationally and at the IFIP) is addressing, amongst other things, two major shifts that are currently affecting housing policy and the housing market:

1. **Transformation of the welfare state:** in many places, housing policy has been more affected than other areas by the political restructuring of the welfare state since the 1980s. The market-oriented reorganisation of housing policy has not only led to a change in the use of state instruments (including changes in housing subsidies or shrinking of housing segments remote from the market, see Ronald and Kadi, 2014), but also reflects a new conception of housing in the welfare state. While until the 1980s the welfare state function of the state, in particular, was perceived to involve providing inexpensive housing, since then there has been a turn towards the encouragement of home ownership and property-related asset-building, through which the state promotes personal pension models (Ronald et al., 2017). This form of asset-based welfare is increasingly being criticised in a context of falling home ownership rates and increased inequality concerning real-estate assets in many countries (ibid.; Kadi et al., 2020; Montgomerie and Büdenbender, 2015; Ronald and Kadi, 2018).
2. **Integration of housing markets with financial markets and digital platforms:** last but not least, the 2008 financial crisis, which originated in barely regulated loans for homeowners in American suburbs that were based on unrealistic expectations, was an impressive demonstration of the extent to which housing markets and financial markets are integrated today (Aalbers, 2016). In this context, research into the relationship between these two sectors and the examination of its implications for housing provision have played an increasingly important role in recent years (Schwartz and Seabrooke, 2008). The same applies to the digital platform sector, which increasingly exerts an influence on housing markets, for example via travel booking platforms (e.g. Airbnb or Booking, see Kadi et al., 2019), but also through a large number of other property-related platforms (Fields and Rogers, 2019).

The housing policy and housing market research strand is relevant for the formulation of evidence-based policy, in particular with regard to the forms and effects of housing policy instruments. As discussed, research work not only documents housing policy structures and changes, but also offers an empirical evaluation of the effects of government instruments on the housing market and on housing provision. One of the challenges faced here is that housing policy displays great geographical variation, not only in relation to current structures, but also in relation to changes brought about by the transformation of the welfare state since the 1980s. For this reason, meaningful conclusions can only be drawn for a specific context. In addition, there are no direct causal relationships as regards housing policy instruments, which makes the evaluation of individual instruments more difficult. Firstly, housing policy instruments interact with each other. Secondly, they interact with economic framework conditions at the macro level (interest rate level, available investment capital, etc.) as well as at the regional or local level (supply or demand structures, labour market, and accessibility levels) in the production of effects. Evaluations must therefore always be carried out in the light of these relationships and interactions.

1 It should be noted that government action and planning first require defining, creating, and securing land ownership, and making the associated spatial property rights of private landowners enforceable against other persons. Any attempt to make reference to purely private land ownership and a supposed opposition between private and state decisions must therefore fail, since state action is constitutive of (i.e. fundamental to) private action and, in modern societies, property does not exist in the absence of state action.

8. LAND AS A LIMITED ECONOMIC RESOURCE: LAND USE AND THE EFFECTIVENESS OF LAND POLICY INSTRUMENTS

Not all natural resources are renewable and infinite. However, they do form the basis for all human economic activities. Moreover, the benefits that people can derive from natural resources depend on the latter's availability. This tension between economic and environmental aspects raises numerous questions, amongst which: how can we optimise the consumption of non-renewable resources over time?

One of the most important resources that cannot be renewed, but on which all human activities take place (i.e. living, working, recreation, care, transport, etc.) is land. Owing to its enormous importance and increasing scarcity, demand for land, which increases as the economy grows, meets a rigid supply. This, depending on temporal and spatial circumstances, is bound to lead to higher land prices, at least in the medium and long term, which entails diverse social, economic, and environmental consequences (including intertemporal ones). In connection with this limited resource, there is thus a complex mesh of relationships linking environmental, economic, and social aspects that must be taken into account when making decisions (Doan, 2018).

Land cover can be divided into several types of use (e.g. building land, agricultural land, or woodland), whereby a gain in land area designated for one use leads to a loss of land area for another use. In recent years, much agricultural land has been converted into building land. The increase in land take-up leads to a higher proportion of sealed ground; this not only has negative effects on the environment, leading to floods, microclimate changes, increased pollutant emissions, etc., but also entails economic consequences (Doan, 2018; Getzner and Kadi, 2019; cf. Bonvissuto, 2018). For example, designations on grassland and, what is more, outside the settlement area, not only damage the local ecology, but also cause additional costs linked to infrastructure expansion.

The connection with planning lies in satisfying the increasing demand for housing while ensuring the efficiency of land use, in particular within the framework of land-use planning and infrastructure planning. Since the current land take-up rate (2018: 10.5 ha/day) lies far above the target value of the 2010 sustainability strategy (2.5 ha/day) (UBA, 2020), appropriate measures are needed to reduce land use accordingly.

The extent of land use and land take-up are dependent on several factors. They are influenced not only by economic development, which requires resources for production and infrastructure expansion, but also by demographic developments, which change human preferences and behaviour. Furthermore, policy-makers can exert a significant influence on land use by introducing various regulations (Getzner and Kadi, 2019).

Existing studies on the influencing factors of land use and on the impacts of spatial planning regulations (Getzner and Kadi, 2019; Doan, 2019; Wieser and Schönbäck, 2010) point to the negative externalities of inefficient land use, both in environmental and economic terms. Furthermore, econometric estimates have shown that existing spatial planning regulations, strategies, and conceptions have no significant impact on land use (Getzner and Kadi, 2019). Land price surveys were carried out in numerous studies (Gutheil-Knopp-Kirchwald et al., 2011; Wieser, 2008). Since in economics the price of a good indicates its level of scarcity, land price surveys provide an insight into the situation on the land market and related markets (housing market, mortgage market, etc.) and can serve as information source for land-related considerations and decisions.

Owing to the complexity surrounding the consumption of non-renewable resources such as land, research in resource economics can provide meaningful evidence on the impact of planning schemes and, thus, contribute to the optimisation of resource management. Furthermore, the evaluation of measures (e.g. economic evaluation of designation levies) can provide answers regarding the effectiveness of existing measures. In practice, it is not uncommon for new designations to be approved, if feasible, without thinking about their costs or about alternative solutions, and for land policy measures to be implemented or new measures to be developed without assessing their effects.

In this thematic field, the following challenges are amongst those that future research should address:

- In addition to the already developed Lower Austria Infrastructure Cost Calculator (*Infrastrukturkostenkalkulator*, or NIKK), which is used to calculate infrastructure costs in the event of settlement expansion and compare the costs of several settlement expansion variants, further planning tools (e.g. area management tool) need to be developed in order to decrease land take-up. A first step would be a comprehensive stocktaking of land assets. Such a land database would provide an overview of current opportunities to deliberately 'mobilise' underused and unused building land. However, area potentialities should not only be recorded but also assessed on the basis of various criteria (location, settlement density, expected building typology, proportion of sealed ground, etc.). The results of this subsequent assessment (environmental effects, economic effects, etc.) would provide a foundation for a sensible land use policy. The development of such tools would also help to significantly reduce the planning effort.
- However, efficient land use also depends heavily on legal regulations. Therefore, the 'mobilisation' of identified unused building land would also require strict measures, the implementation of which must be deliberately monitored in order to achieve the desired effect.

- Beyond this, the evaluation of implemented measures is also important in order to determine their effectiveness and carry out any necessary modifications. A preliminary assessment of measures should be carried out wherever possible (e.g. fiscal measures) in order to optimise them before deployment.

Even though developments on the land market are influenced by many determinants and cannot be attributed in a monocausal way to land policy, knowledge of what is happening on this market is of great relevance for land policy discussions and decisions. Owing to the specific characteristics of land (in particular its immovability and heterogeneity), it is extremely difficult to gain an overview of land market developments. A uniformly structured survey of land prices, including criteria for price-setting features — in order to create land price statistics and a land price index at municipal level — would help increase transparency for land market actors. Econometric analysis could be carried out with the help of land price statistics, explaining significant price changes on the basis of empirical evidence. Such a land price overview would thus enable decision-makers to be more aware of developments in order to initiate appropriate (counter) steering measures in good time.

9. NUDGING: A NEW ECONOMIC PERSPECTIVE FOR URBAN POLICY?

Our research unit's research into instruments of state intervention has most recently been complemented by behavioural economics approaches, combining economic reasoning with psychology. One possible set of instruments can be summarised under the term 'nudging': policies that use non-binding (voluntary) incentives to influence the behaviour of citizens.

In the past years, there has been an increasing preoccupation with 'nudging' as a policy tool, reflected in the steady rise of so-called nudging units across European countries. Nudging can be described as public efforts to change people's behaviour in a predictable way through the design of a choice architecture and without prohibiting any options or their basic economic incentives (Thaler & Sunstein, 2008). One prominent example is the 'Competence Centre on Behavioural Insights' of the European Union, which deals with the integration of behavioural insights into EU strategies and covers a broad field of policy areas such as finance, taxes or health.

The original scope for the use of nudges, namely 'health, wealth and happiness' (Thaler & Sunstein, 2008), has recently been expanded to include 'green' issues. Nudging is an increasingly popular research field in environmental and urban policies. Nudges are understood as a tool that might induce more sustainable behaviour amongst citizens. One of the main ingredients is to change the so-called choice architecture, which is the framework within which individual decisions are made. One possible element of the choice architecture is the default option, i.e. the starting point of a certain choice. For instance, empirical studies showed that consumers were more likely to choose the renewable electricity option if they were offered renewables as the basic option from which they could opt-out (instead of opting-in to the renewable electricity plan).

Given the need for fast and effective measures against climate change, green nudges seem to offer simple and, above all, low-cost solutions for policy-makers. But even if the idea itself describes a potentially promising instrument to save water and energy or reduce private car use, scholars point out that the supposedly positive effects for those concerned fail to materialise whenever nudges go beyond voluntariness, simplicity or transparency (e.g. Tiefenbeck et al., 2013; Schubert, 2017). Hence given the neoliberalisation of many urban policies and the imbalance of power relations within cities (Friedmann 1999), one should exercise caution when taking a closer look at the increasing integration of nudging into urban politics in relation to a city's actual infrastructure provision. It remains to be seen (and researched) to what extent governmental use of this behavioural economic instrument might be (un)justified, especially considering possible or lacking welfare effects (Allcott and Kessler, 2019; Andor et al., 2020).

10. THE ECONOMIC VALUE OF ENVIRONMENTAL AND NATURAL GOODS FROM A PUBLIC INTEREST STANDPOINT

One research field that has been increasingly explored in recent years is the economic evaluation of ecosystem services benefitting human welfare. So-called 'ecosystem services', which are based on ecosystem processes and functions, comprise those services provided by nature that are used by humans in the broadest sense and influence welfare.

A direct connection between these, on the one hand, and planning and the evaluation of planning outcomes, on the other hand, arises from the fulfilment of the public interest through government measures and their implementation by means of suitable instruments, in particular in project assessment and infrastructure policy (Getzner, 2012; Schneider, 2020). The economic or welfare state perspective stems from many causes, amongst other things: the inefficiency of individual decisions (markets) when it comes to guaranteeing and providing essential ecosystem services; the effective planning instruments that are needed and their economic assessment; and, also, with regard to equitable access to ecosystem services (e.g. open access to recreation areas).

As briefly mentioned already, the foundation of ecosystem services consists of the natural processes that take place within ecosystems and are based on their individual elements (e.g. species, habitats, and environmental media). Understanding these ecosystem functions is therefore central to the recording and subsequent evaluation of ecosystem services. In addition to this primarily natural sciences-related viewpoint, we also find an individual and socio-economic perspective: on the basis of existing or newly provided information concerning ecosystem services (besides various other factors), certain perceptions, preferences and, ultimately, (economic) evaluations of ecosystem services will arise.

A conception held from such a point of view is therefore an anthropocentric one, since it is geared towards human perception and evaluation. Natural benefits or effects that are not perceived as such or for which there are no preferences consequently have no economic value in a narrow sense (see Getzner, 2018).

Following the implementation of one of the many economic evaluation approaches, an important conclusion may be the existence of demand for the preservation and improvement of ecosystem services: in Austria, recent studies on protected forests (Getzner et al., 2017), the recreational value of woodland (Getzner et al., 2020) or the willingness to pay for the preservation and improvement of naturalness and biodiversity (Getzner et al., 2018) clearly show that ecosystem services are highly regarded, and that there is a strong preference amongst citizens for the improvement of these services. Owing to the inefficiency of individual market decisions, this has direct implications for the extent, intervention intensity, and planning of government action.

For planning purposes, these approaches mean that, in the case of specific projects, an evidence-based assessment of the costs of a program or policy and its beneficial effects is more transparent and feasible. Too often, the public interest is assessed on the basis of a mainly qualitative weighing-up which, in many cases, leads to prevailing private interests (e.g. the development and expansion of ski resorts in the Tyrolean and Salzburg Alps) being greatly detrimental to ecosystem services. Here, research in environmental economics can provide robust evidence on the importance of ecosystem services.

Three challenges are emerging for future research in this key area for infrastructure planning and assessment:

- Economic evaluations of ecosystem services require time and a financial effort which, though seemingly negligible in the light of the total costs of large infrastructure schemes (e.g. transport infrastructure, tourism, energy production), often do not receive funding. In this respect, a normative implication of present studies is that existing guidelines, for example for carrying out cost-benefit analysis, urgently need to be brought up to the state of the art in science and technology.
- Ecosystem services evaluations, because they are not based on easily understandable market prices and available statistics, are highly context-dependent: the ecological, legal, economic, and institutional framework conditions will differ in every study. Consequently, transferring the empirical values of ecosystem services from one space or project to another will not be automatically possible. The development of a database of various types of ecosystem service (e.g. valued by recreational and leisure benefits, or willingness to pay for biodiversity) provided by specific ecosystems (e.g. woodland, water bodies) would therefore improve transferability.
- Finally, the evaluation of ecosystem services contributes essential information to infrastructure planning. Integrating the assessment of the public interest, in particular regarding ecosystem services, into planning and decision-making processes — and into legal, economic, and institutional principles — would constitute possible research avenues.

In addition to the evaluation of ecosystem services, another research strand related to environmental and climate policy is viewed as essential at the research unit: the economic assessment and evaluation of climate policy instruments and the monetisation of greenhouse gas emissions (GHG).

Various climate policy instruments are suitable for regulating GHG levels straightaway and promoting necessary measures, such as improving energy efficiency or expanding renewable energy production (Laes et al., 2018). In order to lay the foundations for rational decision-making as regards the implementation of policy measures, it is important to assess or monetise environmental improvements (e.g. reduction of GHG emissions) or environmental degradation (global warming), given the lack of market prices.

A number of methods are available for assessing GHG emissions, for instance damage costs. Here, it is important to precisely define the damages that are being assessed. Are only climate-related crop failures included in the calculations, or are health damage (e.g. heat stress, deaths) and adaptation measures to protect against rising sea levels also being assessed?

At the same time, an assessment of climate protection measures may be carried out through the avoidance costs approach. These are not directly related to environmental damage but, instead, describe the costs incurred for reducing or avoiding environmental damage. If one then compares the cost of the expected damage with the cost of avoidance, the supposed benefit of the avoidance measure can serve as a basis for the decision to implement it. The literature displays a wide range of monetary values for one tonne of CO_2. For example, a meta-study (Wang et al., 2019) found that, depending on the type of calculation and context, the 'social cost of carbon' ranged between €-11/t CO_2 and more than €2,000/t CO_2.

While in November 2019 the market price in the European Trading System was around €25/t CO_2, the willingness of households to pay for CO_2 reduction was significantly higher (Alberini et al. 2018; Longo et al., 2008). A survey by Baron and Getzner (2022) found that the willingness of Austrian households to pay for reducing GHG emissions at home exceeds €185/t CO_2. It can thus be assumed that there is a great willingness to pay for climate protection measures in Austria and that new climate policy instruments, such as CO_2 taxes, might also hit fertile ground.

From a spatial planning point of view, it should be noted that there are differences between urban and rural households with regard to the estimated willingness to pay. The willingness to pay per saved tonne of GHG emissions was around €204/t CO_2 in urban areas; it decreased, along with the degree of urbanisation, from €191/t in medium-density areas to approx. €165/t in sparsely populated regions (Baron and Getzner, 2022). Thus, the value of one tonne of GHG also seems to correlate with the degree of urbanisation of one's place of residence. The consequences and impacts of climate change affect different regions in different ways and this indeed seems to be reflected in the degree of willingness to pay for the reduction of GHG emissions. Further questions thus arise for future research, such as the extent to which spatial factors might influence the appreciation of specific environmental goods, or whether increased awareness of the consequences of climate change might promote the financing of mitigation measures. The knowledge gained could help with implementing adequate climate protection measures adapted to a variety of regions.

11. SUMMARY: EVIDENCE-BASED PLANNING AND ECONOMIC POLICY AS A PARADIGM OF PLANNING-RELATED ECONOMIC RESEARCH

The sections of this chapter make it clear that the Public Finance and Infrastructure Policy research unit considers that its most important contribution within the Institute of Spatial Planning lies in planning-related economic research, in particular the functional analysis of the public sector. Building on existing knowledge about decision parameters in the public sector and their influence on the economy, society, and the environment, while taking into account spatial aspects, the research unit's priority is to expand this knowledge through theoretical discussion — by using and developing suitable methodological approaches — and through empirical research.

Our research results enrich planning science and economic policy theory along evidence-based lines, that is to say, above all, by building on a broad theoretical foundation and empirical (i.e., in particular, information and data-driven) quantitative research. Rapid technological progress and the dissemination of new forms of economic organisation influence economic, social, and spatial developments. In order to prevent negative developments or to keep these in check, state intervention is indispensable. However, public intervention should be based on sound knowledge in order to achieve the desired and expected effects. This requires a comprehensive examination of the parameters of public sector decisions, together with evidence-based analysis of the (expected) effects of these decisions, taking into account the uncertainty and limitations of knowledge about future processes. The pursuit of the research unit's epistemic goal, and the deepening and further development of theories of regulating government intervention, are not only concerned with assessing the effects of public intervention with regard to economic efficiency but also, above all, with issues such as the environmental compatibility, as well as the justice and fairness, of economic activities, and access to economic, social, and environmental resources in terms of participation opportunities and options (sustainability). Our diverse theoretical and empirical studies — ranging from the analysis of the need for public intervention, planning cost appraisal, and incentive effect analysis of government instruments, to performance tests of these instruments — presuppose the use of suitable methods and tools.

In particular, amongst central methodological tools we find economic models, statistical and econometric modelling and estimates, economic evaluation methods, and decision-support systems. Statistics and data (e.g. register data), as well as a variety of own surveys, sometimes qualitative, lay the groundwork for the research process. These approaches are complemented by conceptual work and research into the legal and institutional foundations of infrastructure policy. This includes widening the theoretical basis beyond (neoclassical) economic theory, for instance, towards socio-economics, as well as heterodox, evolutionary, and institutional approaches. In addition, studies may be based on, or supplemented by, qualitative research results.

In this way, the research unit uses analytical economic methods to put to the test both planning problems (e.g. market failure in spatial coordination tasks) and the functions, areas of responsibility, and instruments of state

intervention in the field of planning (in a strict sense) and economic policy (in a wider sense). These research results form the basis for spatial economic policies: why, in which sectors, and with which instruments and procedures is planning to be carried out? What are the (economic) advantages and disadvantages of economic policy instruments from an economic point of view, and how are planning results or their implementation (e.g. infrastructure schemes) to be appraised in terms of economic, social, and environmental sustainability?

The aspiration of this 'research paradigm' is to promote rational, evidence-based planning as part of economic policy. This includes concrete schemes and planning processes just as much as market regulation and state intervention through a variety of public policy instruments — and the bright side as well as the drawbacks of government action.

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'With their very diverse spatio-temporal structures and development perspectives, municipalities constitute very challenging 'spatial research labs'. The associated, mostly complex spatial and social problems are prompting the emergence of innovative solutions and planning processes, which need to be underpinned by planning theory and methodology.'

A. VOIGT

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LOCAL PLANNING: MUNICIPALITIES AS SPATIAL RESEARCH LABS

LOCAL PLANNING RESEARCH UNIT

Ao. Univ.-Prof. Dipl.-Ing. Dr.
Andreas VOIGT

'All life is problem solving' (Popper 1994) — this fundamental insight applies most definitely to spatial planning and to politics. Ensuring the long-term existence of our settlement areas, which is dependent upon future-proof design, is a major challenge for spatial planning and spatial development. In particular, this includes the inward development of the settlement system as well as designing the co-evolution of spatial, infrastructural, and settlement-related development. A cautious, resource-conserving, and strategic approach is required when dealing with difficult, at times life-threatening problems. This can only succeed if high-level planning culture prerequisites are fulfilled and taken care of, and if the bridge towards 'building culture' is consolidated. The former includes spatial development actors' ability to learn, the willingness to engage in lasting dialogue, mutual respect, and the willingness to take responsibility and seize the initiative. Municipalities constitute the research object of the Local Planning research unit.[1] These are, without prejudice to the diversity of their spatial complexity and structure, size, location, and spatial context, the 'research laboratories' of the research unit. Diverse spatial contexts (e.g. spaces that are urban or rural, Alpine or extra-Alpine, and confronted with growth or shrinking) and diverse inter-municipal and regional connections make for particularly distinct issues. As regards university teaching of 'spatial planning', the following principles apply: research-led teaching; a simulation of planning reality that is as realistic as possible; project-based study that is grounded in concrete 'laboratory spaces' combined with excursions into these spaces; and constructive discussion with political decision-makers and citizens (IFOER 2019).

To apprehend practice, teaching, and research as a whole and forge links between them: this is the main objective of the Local Planning research unit (IFOER), founded in 1974 as an institute,[2] which has been an integral part of today's Institute for Spatial Planning since 2004.[3] The research unit's staff are equally concerned with strategic issues concerning local and urban development, working out spatial development and site design plans that are nearing implementation, and their legal transposition into spatial development schemes, land use plans, and development plans. This involves the examination of inter-municipal planning issues — including functional and spatial integration into the surrounding space.

At the heart of our research and knowledge transfer at the Local Planning research unit, we deal with issues faced by the actual, lived world of space — in particular settlement cores, be they in cities, market towns or villages — and intrinsic future prospects, and the development of the instruments, methods, processes, and strategies for the design of their future.

COMMENT

This chapter is essentially based on parts of the publication: *45 Jahre IFOER. Örtliche Raumplanung: TU Wien* (IFOER 2019), which came into being as part of the 45th anniversary of the Local Planning research unit (IFOER) at the Institute of Spatial Planning.

1 Cf. Austrian Federal Constitution, Art. 118 (9), *Örtliche Raumplanung*.
2 IFOER — Institute for Local Planning (formerly, 2004 to 2018: Department for Local Planning; since 2019: Local Planning research unit).
3 Formerly (2004 to 2012): Department of Spatial Development, Infrastructure and Environmental Planning, then (2013 to 2019) Department of Spatial Planning.

The research and teaching staff constitute the main resource of every academic research institution: on the one hand, they ensure continuity, as far and as meaningfully as possible while, on the other hand, setting up new initiatives, fostering professional exchange and dialogue, imparting knowledge, and actively contributing to social awareness. As of April 2023, the Local Planning research unit comprised 18 people, predominantly from the spatial planning and architecture fields; they have been shaping the research and teaching domains through a variety of priority areas, namely: local and urban development planning; local and urban design; development planning and spatial planning design; rural and urban renewal; and spatial simulation.

1. PRACTICE-ORIENTED RESEARCH

The Local Planning research unit (TU Wien) follows a long tradition of practice-oriented — and thus action-oriented — research on:

- the development and qualification of methods, instruments, processes, and strategies for spatial and urban development, and their underpinning in terms of planning theory;
- the design and management of inward development, and spatial transformation and renewal processes, both in urban and rural or small-town contexts;
- the development and assessment of strategies for a sustainable, energy- and resource-efficient spatial development;
- the development and qualification of urban modules, and their related implementation and quality assurance strategies;
- planning and decision-making support tools, namely spatial simulation as well as multimedia communication and visualisation methods.

Within these priority areas, the Unit carries out research and teaching projects, sets up knowledge platforms, develops publications, and supervises final year projects, master's theses and dissertations. In order to illustrate these priorities, a selection of current research topics is presented below; to start with, we will describe already completed and current dissertations dealing with fundamental local planning issues, such as: designing the planning process as a learning process; facilitating room for manoeuvre/play; the visual depiction, strategic visualisation, and inner-city development of the urban settlement system.

Open spaces. Performative interventions in the urban context (Emanuela Semlitsch) The call for 'open spaces' refers to considerations concerning the potentialities, conditions, and methods of performative practice in the context of urban development. The starting point is the search for ways to apprehend the invisible aspects of urban everyday life — such as atmosphere, emotion or imagination — as components of spatial perception and spatial production processes, and to integrate them into spatial planning practice. Implicit knowledge in this domain is provided by the author's activity as a 'street theatre performer'. The aim of the work is to unlock this knowledge and make it productive at the intersection with spatial planning knowledge (IFOER 2019, p. 28).[4]

Planning as a learning process (Werner Tschirk) *'Planning processes always involve social and cultural learning and qualification processes. Learning from each other takes centre stage'* (IFOER 2019, p. 11). This is the argument that underpins the research work: 'Planning as a learning process'. It deals with the question of how planners might proceed when they are confronted with the task of solving planning problems whose essential characteristics are complexity, intricacy, and uniqueness. Within municipal development planning, how can we create conditions such that learning and unlearning are promoted — not only to 'develop' a plan, but also to empower the people who are involved in shaping our habitat? The practical basis of this work, which emerged within the framework of the International Doctoral College's Spatial Research Lab[5] are complex urban development projects that possess a special procedural, collaborative, and communicative character (IFOER 2019, p. 28).

Strategic Spatial Visualisation (Julia Forster) The 'Strategic Spatial Visualisation' research work[6] deals with the opportunities to identify the potentialities of sites and presents a method localising and superimposing interdisciplinary information as part of a multidimensional visualisation. The result is a digital city model that can be used as an interface for cross-domain collaborative planning processes and as a planning tool for management and administrative tasks. The work was developed as part of the URBEM (Urban Energy and Mobility System)[7] 'doctoral college programme', an interdisciplinary collaboration between TU Wien and the Wiener Stadtwerke. Using Vienna as an example, URBEM developed and explored an interactive environment in order to devise scenarios for a future *'sustainable, liveable, affordable city with a secure energy supply'* (IFOER 2019, p. 26).

Energy-conscious inner-urban development. Analytical design strategies for the post-oil city. Greater Paris case study (Fabian Dembski) This doctoral dissertation deals with the post-oil city and the issue of how urban spaces that were previously occupied by road traffic might be used for inner-city development purposes in the future. The identification of these spaces is made possible by the innovative combination and application of several methods. The function, use, and design of space are closely interwoven with the theme of the energy-conscious and sustainable city. The Paris case study shows that method sets provide manifold opportunities paving the way for the post-oil city of the future. In this work, this was achieved by combining several approaches in a novel way (Dembski 2020).

In the context of the three-tiered European higher education system, namely: Bachelor's, Master's and doctoral studies, doctoral theses have been acquiring a particular, growing importance. The creation of suitable organisational conditions that promote an interdisciplinary and transdisciplinary dialogue well-structured in terms of content and time is therefore an important prerequisite.

Three dissertations briefly described above were written as part of innovative doctoral college programmes, namely:

4 In 2012, the dissertation received the Rudolf Wurzer Prize from the City of Vienna and TU Wien.
5 www.forschungslabor-raum.info/
6 The dissertation was awarded the Ressel Prize of TU Wien in 2017.
7 https://urbem.tuwien.ac.at/

- International Doctoral College Programme (IDK): Spatial Research Lab,
- URBEM (urban energy and mobility system) and,
- EWARD (energy-conscious spatial planning).

The principles underlying these doctoral programmes, which doubtless helped the dissertation projects to develop successfully at a high level of academic achievement, will therefore also be briefly presented.

International Doctoral College Programme: Spatial Research Lab Since 2007, this Programme has been offering participants with outstanding qualifications the opportunity to tackle spatially important issues of high social relevance through interdisciplinary and cross-border interaction, which has been stimulated by concrete case studies and a common thematic framework; independent, original scientific contributions are thus to be promoted. Support courses and guest lectures by renowned experts impart in-depth knowledge on theories, methodologies, design, and communication. Thematic domains include, for example, settlement area management, spatial and infrastructural development, or cross-border tasks in the field of spatial and landscape development. Since 2007, the International Doctoral College Programme has been made up of three phases. Framework topics included the following: 'Development perspectives for metropolitan regions' (2007–2011), 'Urban landscape transformation' (2013–2016) and 'Crossing borders. Activating spaces' (2017–2020). These three successful 'gateways', documented by 'logbooks',[8] in which principles, research priorities, and findings are critically reflected upon, form a solid basis for possible follow-up research in the European context.

URBEM (TU Wien, 2013–2016) Using Vienna as an example, a virtual city prototype was developed, validated with real data; this is an interactive ICT environment in which variants of the path towards a *'sustainable, affordable, and liveable city'* can be explored through scenarios in a holistic and interdisciplinary fashion. As a result, for the first time, changes in social structure, building stock or transport options, as well as their repercussions on the infrastructure and energy supply, and interactions between all these, can be consistently taken into account and visualised. Ten scientific models of the TU Wien have been developed, underpinned by Wiener Stadtwerke's extensive practical expertise. The main output is an interdisciplinary decision-support tool prototype that can be used both for detailed planning and for urban planning scenarios at a higher governance level.

EWARD (TU Vienna, 2014–2017) The TU Wien's Doctoral College Programme, 'Energy and Resource Awareness in Urban and Regional Development' (EWARD), deals with the following research question: *'How can strategies aiming to reduce the energy consumption and improve the energy efficiency of certain social groups be integrated into energy technologies and urban structures under the current municipal administration?'*

The Programme pursues an interdisciplinary approach and is rooted in 'Eco-efficient Development and Design of the Built Environment', a current research field of the Faculty of Architecture and Planning, as well as in the 'Energy and Environment' research priority of the TU Wien.

8 Three 'logbooks' are already available (International Doctoral College Programme's Spatial Research Lab, 2012, 2016 and 2020).

Dissertation projects continue to be a fundamental prerequisite for the further development of the Local Planning research unit. The following topics that are being explored by the research and teaching team may be mentioned by way of example; they deal with current, socially relevant problems within the local planning research field. The research findings concerning the selected topics are also of potential importance on other levels of governance, namely, regional and European planning.

Algorithm-based spatial analysis for planning support (Stefan Bindreiter) The sustainable inward development of our settlement structures requires transport infrastructure and settlement development planning to be meshed. In this regard, besides the municipal perspective, a regional perspective on municipal planning is also required. In Austria, the factual data that must be collected for such investigations are now available digitally in ever increasing quality. In Simlab, the emphasis therefore increasingly lies on *'the opportunities provided by algorithm-based analysis methods and, thus, how planning efficiency and quality can be increased through the automation of analysis processes and digital algorithms'* (IFOER 2019, p. 30).

Weighing the transformative potential of automated mobility (Emilia M. Bruck) Since the early 2010s, claims of an automated revolution that would not only disrupt transportation systems but also transform the urban fabric and life in cities have been mounting. Amidst the reignited euphoria for self-driving vehicles, planning authorities and public agencies are called upon to prepare and manage the complex and likely messy transition to a future with automated mobility. Yet, resources and capacities of planning professionals to be proactive vary significantly among municipalities and regions. To gain a deeper understanding of how, by what means and to what ends planning professionals prepare for the potential introduction of automated mobility, planning initiatives in the Greater Toronto Area (GTA) serve as a case for an in-depth analysis. Challenging common claims of an external disruption by automation, the focus centres on the transformative potential of endogenous change processes, promoted by creative agency and social learning. The case study reveals the capacity of planning actors in the GTA to create and recreate their environment by altering existing forms of practice. It further shows that changing the means of planning may be pivotal to ensure that local and regional pathways to automated mobility align with broader collective interests.

Corridor analyses in a trans-European context (Isabella Buschmann) Transport corridors form the backbone of spatial development and fundamentally determine both potentials and risks in separate areas. At the trans-European level, these 'veins' connect the East and West as well as the North and South of Europe; they thus constitute bridges between widely varying economic parameters and differing planning cultures. Infrastructure measures implemented in this context significantly affect the planning parameters

of individual municipalities and regions. With the help of priority-related assessment of transport corridors, potential local impacts can be proactively addressed at an early stage and opportunities for municipal and regional spatial development can be seized as early as possible (IFOER 2019, p. 36).

The transformative potential of sufficiency-based urban planning (Mara Haas) In planning and the spatial sciences, degrowth approaches are increasingly being recognised as a potential way of expediting the sustainable transformation of cities and reducing the vast global consumption of resources. Within the degrowth discourse there is general consensus that urban planning is too strongly oriented towards the paradigm of green growth and that there is too little scrutiny of whether consistency and efficiency strategies — such as the use of renewables or e-mobility — allow the expansion of the building stock and mobility to be managed in a resource-efficient way. Sufficiency strategies, on the other hand, are seen as having transformative potential. The central question in focus here is the extent to which urban planning can exert an influence on changing established patterns of behaviour with regard to mobility, housing and consumer culture, and which policy instruments and actors can contribute to promoting sufficiency-based lifestyles. The City of Vienna serves as a case study to illustrate approaches to sufficiency-based planning and identify their potentials as well as barriers to their implementation.

Planning and Health (Magdalena Maierhofer) In what ways do space, the city, and planning affect health and where should we locate hospitals and other health infrastructures? Such questions have always played a key role in planning and, against the current background of a comprehensive restructuring of the healthcare landscape, are reclaiming their importance. Devices that are becoming smaller, automation and digitisation, individualised treatment, and constantly evolving medical and pharmaceutical methods are bringing about fundamental changes in the healthcare infrastructure. While hospitals as we know them probably will not be needed much longer, new healthcare locations are likely to emerge. From the point of view of planning, the question arises as to what role health will play in cities and regions of the future. Which variants and healthcare spaces will develop and how will this affect planning? (IFOER 2019, p. 26)

Location as a common good? On the place of residence in urban development planning (Kerstin Pluch) Cities worldwide are facing a worsening housing crisis: for many people housing is becoming an emergency as sharply rising rents become more and more unaffordable. The financialisation of the housing market pushes residents out of certain areas, often further to the outskirts where housing might still be affordable, though mobility costs increase. Those looking for a flat (because of time-limited contracts, new living conditions, a new job offer, or unaffordability of their current flat) are not only restricted in their choice of apartment in terms of size and quality, but significantly also when it comes to choosing where to live, as certain locations or entire areas of the city are simply not financially viable. This trend not only affects lower-income households.

The (in)eligibility of the place or the location of residence depends on many different factors, such as housing and social policies, legal details and explicit or implicit urban development goals, but also common practices without legal basis that shape the city and the housing market. By focusing on the location of residence these circumstances want to be uncovered and quantified as well as checked for spatial justice. Which policies enable or simplify the privatization of publicly financed assets on the land market? What models or instruments are available to counteract the current public financing of private profits on the housing and land markets? What happens if we consider a location to be commonly created and therefore as a common good?

2. SPATIAL SIMULATION LABORATORY

Thanks to Friedrich Moser, the founding professor of the Institute for Local Planning (IFOER), the principles of 'visualisation' and the 'idea of spatial representation' already occupied a central place in research and teaching from the beginning (i.e. since 1974). These principles aim to facilitate constructive dialogue — and, as a further consequence, to the joint design of space — around the design of planning and learning processes meant to 'raise awareness' amongst all those playing a part in successful outcomes. During the transition from the 1980s to the 1990s, digitally supported methods were integrated into research and teaching alongside to proven, analogue methods of spatial perception, analysis, and representation. Following the merger of a large number of Faculty of Architecture and Planning institutes involved in spatial planning into a 'large institute' (2004), the Interdisciplinary Centre for Spatial Simulation and Modelling was founded and an (urban) Spatial Simulation Lab (Simlab) was conceived, built, and equipped with both hardware and software.

Fig. 1 Spatial simulation laboratory, simulation of inward development potential. © IFOER.

Thanks to a remarkable manifold personal commitment on the part of the staff, stable research activity involving a wide range of research projects has been ongoing since 2009. Currently, Simlab, as a 'research platform' of the Institute of Spatial Planning, is organisationally part of the Local Planning research unit. Simlab-based integrative research is promoted within the Institute of Spatial Planning and the Faculty of Architecture and Planning, involving members of the faculties of the TU Wien and, beyond these, a growing number of European universities — for instance, within the framework of the EU's Interreg and Horizon 2020 programmes.

The Simlab[9] research team deals with visual analysis, the visual presentation of spatial information, and its integration into planning and decision-making processes. Digital tools to be applied in planning disciplines are developed, adjusted, and tested in order to process spatial information in real time in a multiscale, multidimensional, and interactive manner. In this way, various scenarios and solutions can be tested at an early stage during planning and decision-making processes; interventions and their effects can be checked; and interactions can be identified. The Simlab team have been working on the use and development (or further development) of data models that enable a wide variety of both quantitative and qualitative domain data to be linked up with spatial objects. This makes it possible to spatially visualise various development scenarios in a holistic, interdisciplinary, and transdisciplinary way in order to explore entire system overviews and interdependencies both individually and, above all, as a team. Research projects carried out at Simlab deal with, amongst other things, the strategic inner-urban development of settlement systems and spatial energy planning, the resilience of spatial and infrastructural structures, and sustainable spatial design (IFOER 2019, p. 41).

3. RESEARCH-BASED TEACHING

With regard to its multifaceted teaching activity — ranging from the collection and processing of spatial information to its evaluation, the design of spatial concepts, and planning-related processes at the site or municipal levels — the Local Planning research unit is keen to forge close links between theory and planning practice. We use various types of teaching arrangements to impart the necessary methodological, instrumental, communicative, and design skills — and train students in these skills. An important teaching area at IFOER consists of concrete projects during which, in close collaboration with other specialist areas and disciplines, we stimulate the discussion of concrete tasks and challenges originating from planning practice. The Local Planning research unit offers some 30 courses per year, mainly as part of the spatial planning curriculum at the TU Wien. These range from foundational lectures (within the Bachelor's programme), and design and project work (within the Bachelor's and Master's programmes), to modules with a special focus within the Master's programme (IFOER 2019, p. 43). These priorities are also pursued within the framework of Doctoral College Programmes and individual doctoral theses, as described at the beginning.

9 https://simlab.tuwien.ac.at/

It is absolutely essential for a spatial planning course with a practical orientation to provide an education grounded in subject-based integrated projects, conducted in concrete research laboratory spaces, and involving interaction with actors and politicians that is as direct as possible. Two integrated, subject-based key projects are offered during the Bachelor's degree programme, along with another project with a wide range of thematic priorities during the Master's degree programme. Out of the large number of courses in which the Local Planning research unit plays a major role, we shall highlight the two key projects of the Bachelor's degree programme, which are prepared and aided by lectures or by workshops, seminars, and other teaching arrangements.

Spatial Design and Urban Development (Project 1) The technical objective of this project, which occupies a central position in the spatial planning course, is the development of spatial concepts for the cross-sectional, sustainable design of landscape, settlement, and built environment structures on the basis of a detailed analysis of the local and landscape spaces to be handled. To this end, the theoretical expertise that has already been acquired is applied in an interdisciplinary way to concepts and designs at the level of the design plan. Within design groups which, over several workshop days, are supervised by spatial planners, architects, and transport and landscape planners, amongst others, students are given the opportunity to immerse themselves into the complex spatial issues and tasks faced by our cities and communities. The systematic development of alternatives and the ability to develop and implement spatial ideas are also part of the training, as well as the visual and verbal description and communication of planning content (IFOER 2019, p. 48).

Fig. 2 Project 1, Design Workshop. © IFOER.

Spatial development planning (Project 2) Today, spatial development planning is viewed as an interactive, complex process involving politicians, sectoral actors, and local residents. Now as before, the Local Development Plan constitutes the pivotal strategic instrument to manage spatial development at municipal level. The objective of Project 2 is to convey the range of municipal planning tasks and impart a holistic approach to development planning. By working out a spatial development plan for a specific project municipality, the students are meant to arrive at the measures and solutions that are needed for implementation; this involves a problem definition and considering possible development scenarios by setting a bundle of targets. Other objectives of the course content include a simulation of new planning situations that is as realistic as possible, as well as the presentation of planning steps by the students on several occasions. In this regard, the formulation of a perspective for the future — a mission statement — becomes key to questioning established ways of thinking, conventions, and spatial patterns, and to work out new models of spatial development. A project priority is to initiate several options for action and processes (IFOER 2019, p. 54).

As already mentioned at the beginning, the municipalities are the 'research laboratories' of the Local Planning research unit, without prejudice to their varied spatial complexity and structure, size, location, and spatial context. Therefore, both research and teaching emphasise issues and corresponding planning processes in urban areas of varying complexity, as well as in rural and Alpine areas in which urban settlement centres also play a central role. Research and teaching projects provide stimulating opportunities to conduct dialogue with key actors and politicians in municipalities that are very diversely structured.

4. DIALOGUE AND PUBLIC RELATIONS

Direct interaction with planning practitioners is essential for the further development of research and teaching. Various arrangements have therefore been or are being tested in the Local Planning research unit. Examples include the following: Autumn Meetings, launched by Heiner Hierzegger and organised over many years; the presentation of the Friedrich Moser Honorary Award for Local Spatial Planning and Urban Design, together with colleagues from the Federal Spatial Planning, Landscape Planning and Geography Group (*Bundeskammer der ZiviltechnikerInnen* | arch+ing), which concerns both municipalities and municipal planners; and the Urban Futures [*Zukunft Stadt*] series initiated by Rudolf Scheuvens:

Urban Futures The field of urban planning practice needs to constantly adapt to the burning issues of our time. Social transformations, climate change, digitalisation, rising land prices — all these have a direct impact on the planning and design of urban developments. The *Zukunft Stadt* lecture series provides a space for interdisciplinary interaction revolving around future urban development issues. In addition to contributions from the planning and architecture sectors, perspectives from politics, the social sciences, and the arts frequently add to the breadth of the discussions (IFOER 2019, p. 76).

5. CONCLUSION

With their very diverse spatio-temporal structures and development perspectives, municipalities constitute very challenging 'spatial research labs'. The associated, mostly complex spatial and social problems are prompting the emergence of innovative solutions and planning processes, which need to be underpinned in terms of planning theory and methodology. We need to cultivate tried-and-tested formal planning tools as well as developing new tools and informal procedures. The design of sustainable, resilient settlement and spatial structures should continue to be pursued as an objective. Multi-scale treatment of the issues is indispensable in terms of sustainability and resilience and, therefore, requires spatial ideas and processes to be integrated across all levels of local government. Clearer processing of problems and problem-solving options thanks to innovative methods is also essential for the purposes of awareness-raising and dialogue.

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THE CHALLENGE OF THE MOBILITY AND TRANSPORT TRANSITION

Strengthening an integrated approach to land use and transport as well as to science and practice

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We live in a mobility-oriented[1] society. Ensuring mobility means that all people in cities and rural areas can be part of, and participate in social life now and in the future. Thus, it is essential for each and every daily life amenity and means of communication to be accessible (Beckmann 2011; Rammler 2016).

To this end, it is necessary to address the challenges of climate protection and social justice, as well as the diverse social, cultural, technological, economic, and spatial dynamics (including rebound effects), which are closely linked to mobility, in a differentiated and thought-out manner, and to break them down for planning practice. At the same time, there are great uncertainties (Lyons & Davidson 2016), for example how automated driving technology will develop or how online shopping will continue to spread. Also, no transport or spatial planner can or may evade the topic of climate protection. Currently, important questions include, for example, how to change travel behaviour in order to achieve climate goals and, at the same time, improve the quality of life; or how to redistribute space in the public realm in order to create more room for cyclists, pedestrians, and urban greenery. In this respect, the question arises as to whether current planning processes and methods are fit for purpose to underpin policy and the authorities in implementing these forward-looking topics.

It is important to rethink planning processes. Strategies, schemes, and measures should be developed and implemented in a more participative, experimental, proactive, and adaptive way, building on stable planning policy guidelines and corresponding objectives. This will also affect the application and development of methods. For example, scenario-making is currently gaining significance against the background of an uncertain future. It is important for planning arguments to be comprehensible, transparent, and verifiable for everyone. This requires critical thinking and the elucidation of one's own values and positions, instead of hiding behind a supposedly academic objectivity (Cahill et al. 2007; Tornaghi 2010). We planners must overcome the fear of values at last (Keller 1996, p. 141). In planning, it is not only what is technically feasible, but also what is desirable and responsible in terms of ethics that must be taken into account (Dietiker et al. 2015). Thus, there exist a multiplicity of rationalities that are intrinsically explainable, together with a multiplicity of forms of knowledge, and these must be taken up in planning processes — in contrast to the unidimensional scientific rationalism of the pure natural sciences (Healey 1992).

This goes hand in hand with the professional positioning of our research unit: the 'mobility and transport' expert community has followed different approaches to scientific theory for many years. On the one hand, we have the engineering and economics disciplines focusing on transport infrastructures and

1 Mobility is an essential part of everyday life, whereby the specific characteristics of different places are made use of, and an increasing variety of wishes and needs (with regard to accommodation, work, leisure, social contacts, etc.) are fulfilled (Bertolini 2012, p. 16 et seq.). Modern lifestyles and business processes are inextricably linked to mobility.

'It is important to rethink planning processes. Strategies, schemes, and measures should be developed and implemented in a more participative, experimental, proactive and adaptive way, building on stable planning policy guidelines and corresponding objectives. This will also affect the application and development of methods.'

M. BERGER ET AL.

quantitative forecasting and evaluation methods, which follow a positivist understanding of science. On the other hand, social science disciplines place people — with their needs, experiences, and values — centre stage under a social-constructivist understanding of science. Although both approaches do deal with 'mobility and transport', a clear demarcation line of the research logic is usually drawn to justify one's own approach (Wilde & Klinger 2017). In future, it will be important to fuse the strengths of both perspectives and to stand open to new methods and approaches — here, spatial planning must take on this integrative function.

In the first part, this chapter will present three important topics that shape the current planning discourse at the interface of land use and transport:

a the integrated transport, mobility, and energy transition in the context of spatial planning as a planning policy framework for action;
b the supply side, displaying powerful dynamics for change as regards new forms of mobility; and,
c the demand side from a social and psychological perspective, in order to better understand travel behaviour and influence it through 'soft policies'.

In the second part, the chapter will focus on a transformative understanding of science, which must combine research and planning even more closely in order to address future challenges.

1. PLANNING DISCOURSE AT THE INTERFACE BETWEEN LAND USE AND TRANSPORT

(a) Integrated transport, mobility, and energy transition in the context of spatial planning

In recent years — against the backdrop of the global climate crisis – the urgency of a transport transition has become increasingly clear.[2] The term 'transport transition'— in accordance with the definition by the Agora Verkehrswende (2017) — includes both the need for a mobility transition and an energy transition. The reduction of energy consumption (mobility transition) and meeting remaining energy needs through climate-neutral energy (energy transition) will be decisive. While the energy transition faces technical challenges above all, the mobility transition must drive forward a new mobility culture. It is important to expand the supply of integrated transport in order to facilitate multimodal behaviour (Agora Verkehrswende 2017).The objectives of the transport transition can be summarised as follows:

better conditions for walking and cycling, greater intermodal services supply (i.e. easy availability of various means of transport), and the electrification of the remaining motorised traffic (Loske 2018). Taking sustainable development seriously, aiming for a *'zero-emission mobility: clean, connected, competitive'* (European Commission 2018) in the field of transport and mobility, therefore means that — in addition to the technical challenges of the energy transition — there must be profound changes in travel behaviour. An integrated transport planning policy will thus require both push and pull measures in this respect. Hence in recent years the pressure on governments and industry to promote radical initiatives in the field of transport in order to reduce CO_2 emissions has intensified. The transport transition is also associated with an added value that goes beyond climate protection: air, noise, and health factors, as well as the quality of enjoyment in public spaces (Agora Verkehrswende 2017, p. 91). In relation to the complex network of actors in the transport sector, spatial planning also plays an essential role, which will be discussed in the following section against the background of the desired transport transition.

Spatial planning in the context of the transport, land-use, and energy transition: transport and accessibility[3] have always had a central, complex mutual significance for the spatial organisation of society ('transport land use feedback cycle'; Wegener & Fürst 1999; Bertolini 2012). Matthes & Gertz (2014 p. 37) provide an overview of settlement structure properties and their effects on transport. In her dissertation, Kasraian (2017) addresses the (long-term) interactions between transport infrastructure, land use, and travel behaviour. Within complex social processes, spatial structure-related aspects have led to the already problematic increase in traffic and its climate impacts. Settlement structures have developed over the past decades in such a way that they have made people dependent on private cars. Together with an 'individualisation trend' that has shaped travel behaviour, the private car has taken a dominant position (Knie 2016, p. 43).

Interactions between land use and transport play a major role in the planning discourse: scattered settlement structures and reduced spatial resistances, on the one hand and, on the other hand, the hope that integrated spatial and traffic planning ('city of short distances' planning paradigm) will reverse these interactions, which until now have had a traffic-inducing effect, and will promote the political and planning objectives of traffic avoidance and modal shift (Holz-Rau & Scheiner 2016, p. 452). However, this interaction has to be considered within a larger context: there are also other, particularly climate-relevant social drivers[4] of traffic growth (e.g. economic growth, globalisation, expansion of education, or emancipation) that fall outside the remit of settlement structure-related measures. In addition, the population structure also differs across a variety of spatial contexts, contributing to differences in spatial structure, described as 'residential self-selection' by Holz-Rau & Schreiner (2019, p. 13). Despite a partial lack of empirical evidence and a high degree of complexity of the changing framework of land use and transport, the design of settlement and spatial structures must be thought of in terms of low traffic. The mission statement of the mixed-use, compact structure and of (urban) sustainable local transport makes a significant contribution to environment-friendly mobility (BBSR 2019, p. 7). Thus, a 'spatial *understanding* transition' (in analogy to the term *'transport* transition') seems indispensable! The starting points for an integrated approach to transport and land use with regard to sustainable mobility include, for example: densification,

2 The transport sector (45.8%) is one of the largest contributors to greenhouse gas emissions in Austria (Umweltbundesamt 2019: 58). With 23.7 million tonnes of CO_2 equivalent, the transport sector was the largest source of greenhouse gas emissions outside the emissions trading system in Austria in 2017. Owing to the increase in road traffic performance and the sharp rise in fossil fuel sales in the transport sector, the sector has seen an increase in emissions of 71.8% since 1990, the strongest growth in all sectors over this period (1990–2017) (Umweltbundesamt 2019, p. 103).

3 Definition of accessibility: 'Focusing on passenger transport, we define accessibility as the extent to which land-use and transport systems enable (groups of) individuals to reach activities or destinations by means of a (combination of) transport mode(s)' (Geurs & van Wee 2004, p. 128).

4 In addition to spatial and infrastructural factors, social dynamics and social change have also contributed to increased transport expenditure. For example, higher incomes, higher educational and specialisation levels, gender equality, virtualisation, multilocation, and dual-career couples lead to greater travel distances and a higher degree of motorisation (Holz-Rau & Scheiner 2019, p. 13 et seq.).

mixed use, choice of residential location,[5] design of buildings and public spaces, public transport-oriented settlement development,[6] etc. (Banister 2008, p. 75).

Spatial planning can also uphold climate protection initiatives in freight transport. In addition to discussions about new engines, location choice issues are also of great importance. The distribution of freight traffic-generating spatial uses and the availability of storage and trans-shipment areas for bundling goods constitute a framework for efficient transport logistics with low traffic overheads (Leerkamp 2019, p. 22). In view of the extremely limited supply of suitable large-volume logistics infrastructures in urban areas, which is due to increasing densification (Todesco 2015), and the potential use conflicts around existing urban zones, distribution points are mainly located outside cities, so that the Last Mile is almost exclusively by truck and van (Schäfer et al. 2017; ZF Future Study 2016). Internationally, some ideas have already been floated concerning micro-depots or city hubs (Holthaus 2016), but implementation often fails owing to space unavailability. The promising RemiHub project (www.remihub.at) of our research unit addresses this challenge by clarifying, designing, and testing requirements for how centrally located public transport spaces might be used as temporary, urban logistics hubs and operated according to a hub & spoke model in combination with cargo bikes and also, in the future, e-transporters or (public transport) automated vehicles for the Last Mile delivery.

Spatial planning will also play an essential role in the energy transition (with regard to schemes, areas, locations, and routes — the keyword being spatial energy planning, see, for example, Erker et al. 2015; Dumke 2017); for example, the expansion of renewable energies is associated with further (conflictual) space requirements and is increasingly the subject of (political and participatory) negotiation processes (Kühne & Weber 2018). Future energy supply will be decentralised, complex, and shaped by a variety of actors. The required transport electrification will need the creation of sectoral coupling between (renewable) power and the transport sector (undergoing electrification). The idea is that battery-powered vehicles (in fleets) will operate as energy storage and buffers, thus becoming part of the future renewable energy world. In addition to mastering numerous technical challenges, this will also require new business models, i.e. organisational innovation (Canzler & Knie 2019, p. 18).

However, (scientific) findings on the interactions between spatial aspects and transport and the contribution of spatial planning to the transport transition will not be sufficient. A major challenge here lies in the purposeful influencing of the roots of the causal relationships between land use and transport. Thus, for example, schemes that tackle spatial permeability are hardly capable of achieving a political majority (Holz-Rau & Scheiner 2019, p. 13). The practical implementation of plans is therefore inadequate. Indeed, while increasingly normative objectives of the transport transition are now to be found in various high-level position papers (e.g. *Österreichisches Regierungsabkommen* 2020), it remains to be seen how these might be anchored in everyday planning practice and in local politics.

5 The issue of residential locations as starting and ending points is of crucial importance in this respect: if it were possible to encourage people into sustainable means of transport right at their residential location, this would have a great potential for a more environment-friendly overall transport system.

6 The 'BahnRaum' project, in which the Transportation System Planning research unit was significantly involved, investigated the potential and processes of railway-bound settlement development in Austria. Substantial spatial planning options can be found at various levels: regional planning, location planning, local development schemes, zoning, development planning, active land policy, awareness-raising, and mobility management (BahnRaum internal final report: p. 256 et seq.).

Significance in terms of planning practice I: Planning is design! We can't do without any objectives! The field of tension between technical competence and political legitimacy can become visible, for example in established fora where traffic planning regulations are formulated. It will be decisive for these to be increasingly aligned with normatively, politically legitimised objectives (e.g. the transport transition), self-evidently without compromising technical competence or evidence. In this regard, an appeal to the supposed independence, neutrality, and objectivity of science will require a critical examination of ideology and, in the face of pressing challenges, must be questioned. Ultimately, normative orientations — through their anchoring in traffic planning regulations, legislation, etc. — must also be translated into clear conceptions of objectives at the integrated planning level (Hoor 2020, p. 23 et seq.). It is important to break up rigid administrative and planning processes, and to view research and planning as tasks (with their own normative objectives) striving to shape reality.

Significance in terms of planning practice II: Planning is communication! Without a tangible transmission of normative strategic objectives, it will not work! A strong narrative is important to drive forward the transport transition! Thus, the current dominance of private traffic, and its legal, fiscal, and infrastructural prerequisites, is primarily due to a strong narrative and a political programme oriented towards it. The objectives of the transport transition (normative prioritisation of active travel, strengthening of public transport and of intermodality, and electrification) must now be pursued with the same consistency — yet indeed, but a narrative is still missing (Canzler & Knie 2019, p. 18). The necessary transport transition is above all a problem of implementation. So far, science has barely managed to convey insights and necessary strategic objectives to various target groups. So how might research and planning communicate strategic objectives and make them tangible? Storytelling is a tool of scientific communication that is increasingly being used to present complex issues in an understandable way.

A first attempt showing how one can strengthen social acceptance of the necessity for a transport transition and prepare the subject matter beyond technical language and the expert community is a comic by the Agora Verkehrswende in collaboration with Ellery Studio (Agora Verkehrswende 2020). It should be borne in mind, however, that content preparation is not enough: target group-specific dissemination and communication are crucial.

An extended form of storytelling is data storytelling: '[...] *trans-forming data into information, information into knowledge, and knowledge into stories*' (Klanten 2008, p. 108). Maps are often presented as the end result, but this frequently triggers a certain distrust on the part of the viewer, since the formation process is not transparent — especially if little knowledge of how to use data processing tools is available. By disclosing the formation process (stages of data preparation and aggregation), for instance by embedding it in a participatory process, the effectiveness of telling planning stories in this way can be multiplied (Berchtold 2016, p. 230 et seq.). For a long time, it was difficult to represent and convey temporal dynamics in map shape. The Seestadt Aspern Mobility Panel is following innovative paths with regard to data storytelling by sharing videos on travel behaviour, including temporal dynamics, on social media (https://bit.ly/2wEdj3q). As a result, scientific

surveys and their results become tangible for residents, and ought to strengthen the individual motivation to engage in multimodal travel.

Apart from innovative methods of scientific communication, the credibility of science and research also plays an important role. In addition to professional competence, acting consistently in accordance with one's own research results (e.g. sustainable travel behaviour) is absolutely required (Getzinger et al. 2015), wholly in line with the English expression: 'Walk the talk!' This responsibility must also be taken on by the university 's spatial and transport planning discipline — a) coupled with a high degree of self-reflection through the individual behaviour of researchers, b) by actively taking a stand and, c) by naming planning conflicts and considerations in a language that is understandable to as many non-experts as possible.

(b) New forms of mobility and their contributions to the transition

In recent years, organisational and technological innovations in the field of transport have mushroomed, bearing hope for the development of climate-friendly mobility. The goal must be that (automated) zero-emission vehicles will be used for shared travel and embedded in an integrated mobility service plan (MaaS) (Lennert & Schönduwe 2017, Mitteregger et al. 2020). However, transformation processes, i.e. the far-reaching transformation of systems in the field of transport, do not follow linear paths and are complex, which means that many factors have to act in concert in order for innovation or implementation processes to be successful. The multi-level perspective (Geels 2012) describes socio-technical systems as a structure consisting of three levels: 'niches, regime and landscape'; it thus combines structuralist and action-centric approaches. For instance, technological or social innovation might arise in protected niches and subsidised programmes, before being gradually adapted and establishing itself in the regime across society as a whole. The process perspective makes it possible to systematically comprehend traffic innovations, such as the introduction of mobility-as-a-service, shared mobility or e-mobility, taking into account both the action logics of actors and the influence of structural framework conditions (Wilde & Klinger 2016, p. 18).

In particular, digitisation highlights the technological developments that are currently bringing organisational travel innovation into focus. In the future, integrated services should be an even more attractive prospect than car ownership. At the heart of MaaS, public and private transport services[7] and different types of traffic may be combined and accessed on a uniform, digital portal (e.g. an app) (EPOMM 2017; Jittrapirom et al. 2017, p. 14). MaaS is intended, on the one hand, to offer users individual, tailor-made travel solutions and, on the other hand, to improve the efficiency of current transport systems and public resources, also with regard to areas with a dispersed population (Hoadley 2017, p. 5 et seq.). Depending on the spatial context, there will be different needs for different vehicle categories and different objectives as to what MaaS can achieve (MaaS Alliance 2017, p. 19). It is crucial for MaaS to be rolled out across the board and for politically clear rules to exist in order to minimise the risk of new, worsening socio-spatial inequalities. Operator structures with a purely commercial orientation can namely lead to MaaS being provided exclusively in dense urban fabrics, whereas those people living in sparsely populated areas have no (or limited) access to it. In the context of rural areas, the MICHAEL project, which was led by the research unit, has been working on creating an integrated offering of car and ride-sharing. The greatest challenge in this regard was to attract a sufficiently large number of users. Infrastructural conditions therefore do not automatically lead to changes in travel behaviour per se (see Section (c) for details). This is precisely where the ULTIMOB project comes into play: in order to create new mobility services in the sense promoted by MaaS and to combine them with existing solutions in a meaningful way, it is not sufficient to solely engage in the development of technical solutions or digital offerings. Rather, it is much more important to also pay attention to topics such as users and governance and thereby overcome obstacles, create trust, and develop new collaborative models. The project, in which the research unit is involved, is helping position the topic of MaaS in Austria solidly and in terms of social added value.

Automated vehicles (AV) are a technological innovation that will radically reorganise traffic and the way we travel. While much research is being conducted in the field of technological development, the research unit is dealing with the interface between AV, spatial structures, and their use (Soteropoulos et al. 2019). As a result of providing more comfort and the availability of journey time for other activities, AV will influence accessibility and, thus, also transport demand. Hence in the long term, it is likely that AV will also affect the location choices of households and companies and, thus, modify settlement structures.

Soteropoulos et al. (2019) provide an overview of current scientific findings on this topic. Their study, *Systemszenarien Automatisiertes Fahren* in der Personenmobilität (SAFiP), in which the research unit was significantly involved, shows how automated vehicles might transform passenger travel and thus, also, spatial structures in the future. The scenarios that it developed demonstrate that automated driving will create new modes of transport that might supplement the existing transport system, or replace or displace the use of established means of transport. There is a risk that sustainable (transport policy) development goals will be counteracted by an increase in the number and length of journeys induced by the new qualities of the private motor vehicle. Against this background, it is important to prioritise the modes of transport (Soteropoulos et al. 2019). Purely technological development must go hand in hand with a transformation of travel behaviour. In this regard, it is imperative that social divisions do not become more entrenched, and that transport innovation remains accessible to all social groups (see also project AVENUE21, Mitteregger et al. 2020).

(c) Understanding and Changing Travel Behaviour

In addition to the technical aspects of (transport) innovation, as already mentioned shortly before, social and psychological factors related to future users, which often tend to be ignored, will play a decisive role in accelerating the transport transition (Barr 2018; Whittle et al. 2019). Modern society is characterised by increasing inequalities and differences: in socio-economic terms (for example, contrasts between wealth and poverty, or a more flexible labour market);

7 At the heart of MaaS (in addition to public transport), we also find shared mobility services, i.e. mobility services that enable shared use by different people (BMVIT 2016, p. 12). This gives people access to means of transport without having to own them (Kollosche & Schwedes 2016, p. 26). In recent years, in particular, a strong dynamic in the shared transport market could be observed; as a consequence, stakeholder structures are changing rapidly and new negotiation processes (including in public space) are needed.

in socio-demographic terms (e.g. ageing society, smaller household structures, or migration); and in socio-cultural terms (e.g. changing values, lifestyle, travel behaviour, social background) (Dangschat 2019). New transport solutions go hand in hand with changes in social practices and, vice versa, social practices create new solutions through sharing and community building, amongst other things. A sound understanding of the transport culture, and of cultural car dependency — in the sense of a symbolic and affective charge of meaning — is essential (Hoor 2020) in order to be able to effectively combine 'hard' and 'soft' measures (Schwedes et al. 2018). Behavioural change theories (e.g. Bamberg 2013) assume that different phases/degrees of motivation must be experienced before a change in behaviour can take place (Prochaska & DiClemente 1984). In this respect, psychological influencing factors also play an essential role, for instance attitudes, social norms, and perceived behavioural control (Theory of Planned Behavior, Ajzen 1991) as well as personal norms (Value-Belief-Norm Theory, Stern et al. 1999; Norm Activation Model, Schwartz 1977). Affective (e.g. driving pleasure), symbolic (e.g. status, external perception), and instrumental motives (e.g. costs, time) also play a role in the choice of means of transport (Steg 2005). How might one influence travel behaviour in a differentiated society?

One approach consists in apprehending various target groups within the population, and their 'mental barriers' with regard to new forms of mobility, in a differentiated manner, and then developing incentive and learning systems that are tailored accordingly (Dangschat 2017). Hence in recent years, an increasing number of projects have emerged that place person-focused interventions centre stage and, in this way, address individual circumstances, for instance through mobility management and communication as well as dialogue marketing (Müller-Eie et al. 2019). We must aim for new forms of mobility (e-mobility, shared travel, etc.) to be used not only by early adopters but also more widely across society. In this context, it is particularly relevant to analyse possible rebound effects. For numerous transport innovations (see Section (b)) run the risk of rebound effects, which must always be taken into account ('Dynamik und Prävention von Rebound-Effekten bei Mobilitätsinnovationen', study by Seebauer et al. 2018).

In future, it will be crucial for social dynamics and the travel behaviour, attitudes, values, and motives of the population to be more deeply incorporated into the interactions between land use and transport in the context of the transport transition (Holz-Rau & Scheiner 2016).

2. SPATIAL PLANNING, A SCIENTIFIC DISCIPLINE: TRANSFORMATIVE SCIENCE IN THE TRANSPORTATION SYSTEM PLANNING RESEARCH UNIT

So in what ways can integrated spatial and transport planning as a scientific discipline with a great deal of practical relevance position itself, and how should it do so in future? Land-use and transport-related research is — owing to its social relevance in the design of living environments and realms of experience — not to be regarded as an 'elitist' task for scientists, but requires various actors to act in concert. A crucial keyword here is 'transdisciplinarity', understood as an organisational principle for the integration of different forms of knowledge and an accelerated exchange with practitioners.[8] The aim is to generate *'socially robust knowledge'* (Nowotny et al. 2001) — that is to say, knowledge that is both relevant to the scientific discourse and functions as an orientation and action guide for practitioners, while having the potential to drive change processes such as the transport transition (mobility transition and energy transition) (Schneidewind 2018). The aim is to build up knowledge that is essentially based on the 'implicit knowledge' ('user knowledge') of people and is connected with the scientific expertise of various disciplines. In this context, there are also participatory research approaches, such as real-life laboratories and living labs, which underline the importance of early and continuous involvement of (end) users in the development process through joint co-creation with the developers (Quadruple Helix Model: dynamics from the University — Industry — State — (media-related) Public Sphere, and their specific forms of knowledge; Carayannis & Campbell 2009). Against this background, in recent years urban mobility laboratories (UMLs)[9] have been established in Austria; they function as an organisational structure and a process at the same time, and have a local connection. In the aspern.mobil LAB, our research unit is actively building up a UML, thus creating tangible experimental spaces as a research environment for residents, researchers, public authorities, and companies (https://www.mobillab.wien/). As a result, social and technological transport innovations can be developed and tested on site in the Seestadt Aspern [urban development area on the edge of Vienna] in the actual physical environment. The aspern.mobil LAB provides a wide array of infrastructures for this purpose, ranging from technical tools (such as sensors) and premises to a social user community. So far, 24 research and development projects have made use of this institutionalised framework in order to be able to carry out their projects more efficiently and closer to real practice. Furthermore, the multidisciplinary team of aspern.mobil LABs (Faculties of Architecture and Planning as well as Informatics) can make use of these projects as well as a broad practice-oriented, methodological development, thus offering usable tools straightforwardly, including outside of research in a narrow sense.

Planning practice benefits greatly from experimentation rooms. In one current research project, Tactical Mobilism, (municipal) administrations and the local population are trying out how traffic organisation in public space can be changed through temporary interventions. This opens up new possibilities to use the space, a new atmosphere becomes perceptible, diverse perspectives can be formulated on site, and conflicts are named and dealt with. The aim is to dismantle mental barriers that are obstacles to a redistribution of road space and to pave the way for the permanent transformation of public spaces in favour of a greater quality of enjoyment as well as of cycling and walking. In public spaces, in particular, a new culture of experimentation and testing can be translated into practice in a tangible and participative way for various actors and residents (Canzler & Knie 2019, p. 18 et seq.). We need science[10] that can stimulate changes in practice and practice that is open to the findings of science (Bertolini 2012, p. 22). In this understanding, learning is a collective process that intertwines action and knowledge, experience and conceptualisation. Our scientific research practice is

8 The basis for this approach is excellent disciplinary and interdisciplinary research.

9 In 2016, the Transportation System Planning research unit was significantly involved in the complementary study that explored the topic of Austrian Urban Mobility Laboratories (UMLs) (Berger et al. 2016).

10 What is problematic in this context is that science is still predominantly measured according to academic success (international publications, international reputation) and the exchange of ideas with planning practice does not gain any appreciation in this system (Bertolini 2012, p. 23). University teaching also ought to be oriented in such a way that future spatial planning graduates can combine these two worlds (research and planning practice) and act as mediators.

Tab. 1 Criteria for future land-use and transport research. Source: Helming et al. 2016, p. 162, supplemented by Nelson & Cheng 2017.

Ethics	Dealing with diverse norms and values
Integr. approach	Inclusion of interactions between several systems (temporal, spatial, analytical, and methodological)
Interdisciplinarity	Integration of approaches (and methods) from different disciplines in order to work on complex problems
User orientation	Taking into account the needs of (potential) users of research
Examination of effects	Preliminary assessment and project evaluation regarding direct/indirect, intended/unintended consequences for communities and the environment
Transdisciplinarity	Embedding practical knowledge (external to science)
Transparency	Open approach to normative foundations, impact of financing, etc.
Dealing with complexity and uncertainties	Disclosure of risks and uncertainties (research question, methods, results)
Diversity	Aiming for greater diversity amongst all actors involved (scientists, users, etc.)

based on criteria favouring socially responsible research, both with regard to the choice of topics and the design of the research process. Indeed, the responsibility for social transformation lies not only with politics, business, and civil society, but also with science (Helming et al. 2016, p. 161). In future, land-use and transport-related research should apply the following criteria more strongly:
Apart from the above-mentioned criteria, it is becoming increasingly important — especially for academic structures — not only to inform in a passive way, but also to play an active role and promote implementation in practice. In this respect, one should not underestimate one's own responsibility as a scientist and one's own role in transformation processes (Fazey et al. 2018).

Position statements of the Transportation System Planning research unit:

- We will take greater account of the interfaces between transport and spatial planning both in research and in planning in the context of our mobility-oriented society.
- We will consider interactions between transport and spatial use above all in a small-scale and socially differentiated way, and discuss anew 'accessibility' as the key link between spatial and transport planning.
- We will consolidate climate protection and the environmental aspects of transport planning in our research and teaching.
- We deem necessary a normative positioning and prioritisation of the means of transport as a basis for implementation in planning practice.

- We will continue to strengthen actor-centredness (users and their mobility) in research and planning (in relation to transport planning, mobility management, and mobility evaluation).
- We will drive forward the transport transition (both on the supply and demand sides) and provide experimentation spaces for planning practice in order to learn better together.
- We will expand our scientific communication and collaborate with experts to achieve target group-specific communication so that positions and results stemming from research may be disseminated to a large number of stakeholders.
- We will actively convey the consequences and effects of planning and research activities in our teaching, and raise the awareness of future spatial and transport planners.
- We will keep an open mind for new topics and for exchanging ideas with other disciplines and practitioners.
- We will act as role models with regard to sustainable everyday travel.

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SPATIAL PLANNING SCIENCE FOR THE SOCIO-ECOLOGICAL TRANSFORMATION

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But if there is such a thing as a sense of reality—and no one will doubt that it has its raison d'être—then there must also be something that one can call a sense of possibility. Anyone possessing it does not say, for instance: Here this or that has happened, will happen, must happen. He uses his imagination and says: Here such and such might, should or ought to happen. And if he is told that something is the way it is, then he thinks: Well, it could probably be just as easily be some other way. So the sense of possibility might be defined outright as the capacity to think how everything could 'just as easily' be, and to attach no more importance to what is than to what is not. (Robert Musil, *The Man Without Qualities*, transl. Wilkins and Kaiser)

Spatial planning deals with the design of appropriate spatial framework conditions at different levels for a future worth living in and, today more than ever, with the management of mutually reinforcing processes in society, the economy, politics, and nature (including climate change and increasing social inequality), which are currently perceived as crises ('climate crisis', 'refugee crisis', and 'economic crisis'). In spring 2020, the 'Covid crisis', in addition to its very own problems, exacerbated some of the challenges already present. Opinions differ widely as to how to proceed after the forced break and who is to pay the bill.

From a social-science point of view, crises are not least perceptual phenomena and patterns of interpretation. They disrupt established routines, create uncertainty, and suggest the need for a solution (cf. Schulze 2011, Mergel 2011, Koselleck 1959). Various actors and institutions — including from the spatial planning field — are involved in their construction and interpretation.

In discussing the future of spatial planning, we will address by way of example the 'climate crisis' and the debate (with ramifications far beyond this) about a socio-ecological transformation. In doing so, we test Musil's notions of 'sense of reality' and 'sense of possibility'.

Spatial planning actors and institutions possess an extensive knowledge and set of tools (sense of reality) enabling them to meet current challenges in the economy, society, and the environment. But in view of continually increasing land take, intra- and interregional disparities, socio-spatial inequalities, and civil protests in many cities, their outreach seems limited. Knowledge about interrelationships in spatial development, to which, amongst others, sociology has been making a significant contribution through spatial planning research and teaching at the TU Wien since the late 1990s (including lifestyles, social *milieux*, participation, and governance), is necessary, but apparently not sufficient.

In addition to a diagnostic 'sense of reality', a pronounced 'sense of possibility' is needed, especially in times of crisis, in order to point out new avenues, and

NOTE

This chapter is based on a collective brainstorming session of the Sociology research unit at the TU Wien, held in January 2020, on the future of spatial planning science from a sociological perspective. The wording, and thus also the content and editorial responsibility, therefore lies with the authors.

'Spatial planning can make an important contribution to a socio-ecological, "re-embedding" transformation. To this end, its diagnostic sense of reality, as well as its mobilizing sense of possibility, are required.'

S. GÜNTNER ET AL.

to motivate and mobilise the relevant social forces. This requires considered assessment, evaluation, and interpretation strategies of the knowledge base that indicate how available knowledge should be handled in spatial policy and administration.

Current discussions on a so-called 'New Green Deal' reveal the interpretive frame of the current understanding and management of the crisis in an exemplary fashion. Amongst large sections of decision-makers, they are characterised by a path-dependent tendency towards the growth paradigm. Alternative positions that call for a shift away from growth models and a socio-ecological transformation may be sensed, but have not yet prevailed in the struggle for interpretation. Unlike reformist policies, a transformation policy aims to fundamentally re-embed the economy within society and the environment, the requirements for which were already worked out by Karl Polanyi in his book, *The Great Transformation* (Polanyi 1944). Environmental destruction and increasing social inequality are, if nothing else, linked to capitalism, the growth paradigm, and the neoliberalisation of politics. A 're-embedding' transformation therefore requires a fundamental change, a *Great Mindshift* (Göpel 2016) in thought and action in all sectors of society, not only in politics. For example, the notion of a socio-ecological transformation complements demands for justice and sustainable prosperity for all, democratisation and solidarity, the reduction of resource consumption, an end to the focus on fossil fuels, and a strengthening of the public sector (cf. Brand 2014).

Spatial planning can make an important contribution to a socio-ecological 're-embedding' transformation. Its diagnostic sense of reality and its mobilizing sense of possibility are both required — from knowledge about the patterns, rationales, and relationships in connection with current land take and resource consumption to approaches regarding (re-)direction, regulation, communication, and participation at various scales. Some points of departure for this are to be developed below.

1. SPATIAL PLANNING, POLITICS, AND KNOWLEDGE

In terms of the sociology of planning, the political framework for spatial planning may be viewed as fluctuating and, at all times, set in relation with a changing society. It is the result of negotiation processes between various actors from the political arena, public authorities, the economy, and society. Sociological contributions repeatedly make recommendations for governance structures, especially with regard to the implementation of cooperative, collaborative, and participative procedures. The influence of the so-called 'communicative turn' is clearly visible, above all in the scientific tradition of spatial planning. In planning policy practice, this has also led — albeit with limited scope — to expanding the participation of citizens, in particular in terms of quality and quantity, various cities and regions. Accordingly, in addition to spatial analysis expertise, spatial planners should also acquire social and communicative skills along with competences in the design of joint and participatory processes during their studies in order to be able to successfully design and implement such processes.

The combination of diagnostic and mobilising competences is fundamental, because it is all about initiating social processes within planning projects, the outcome of which cannot (really) be foreseen. However, communicative planning and also, more essentially, spatial governance, understood as collaborative and network-like forms of steering and coordination of state and non-state actors, has been the subject of criticism for some time: it has been accused of, amongst other things, power blindness and the aggravation of social inequality. In order not to degenerate into ineffective *'particitainment'* (Selle 2011) but, rather, to pave the way for a socio-ecological transformation, a planning policy framing of communicative procedures is required, which both gives unassertive population groups a voice and also keeps an eye on the environmental footprint of planning schemes.

Sociology has also addressed the topic of *'societal relationships with nature'* (Görg 1999) at an early stage, focusing on the role of spatial planning. Although the notion of 'sustainability' constituted the framework for the debate about the future and the goals of spatial developments for a long time, it soon also became the object of critical attention — the dominance of the growth paradigm was all too obvious: not so much in the theoretical foundations, which take 'harmony' or an integrative balance of the key dimensions as a starting point, but rather in the economic hierarchisation of objectives in the context of planning practice-related and political action. Thus, the 'imperial way of life' remained firmly anchored in production, consumption, and everyday life (Brand & Wissen 2017), that is to say, exploitative ways of life in the so-called Global North at the expense of the ways of life in the Global South (Lessenich 2016). According to the current diagnosis, the *'society of sustainability'* (Neckel et al 2018) is rather characterised by *'sustainable unsustainability'* (Blühdorn et al 2019). Spatial planning should also ponder this discrepancy between (above all) political objectives and discourses, on the one hand, and production and consumption patterns, on the other hand, because this strengthens its sense of reality.

The knowledge base in spatial planning is already well differentiated and sensitive to socio-spatial problem statements. In addition to 'classical' social structure data, social space studies now constitute the self-evident foundation for development plans in many cities and shed light on living conditions in urban districts. They provide evidence of increasing segregation, social polarisation, and declining cohesion. Hence if these insights have not led to any fundamental changes in housing, land use, transport, and other spatial or planning-related policies, this is not necessarily due to a lack of knowledge but, above all, to the fact that within neoliberal and austerity policy discourses and policies, such good arguments do not carry enough weight to win the day. Moreover, in practice such principles often remain closely linked to sectoral contexts of application; connections between social, economic, and environmental issues are either omitted or merely alluded to.

2. THE 'CLIMATE CRISIS' AS A CHALLENGE AND AN OPPORTUNITY FOR SPATIAL PLANNING

One of the greatest societal challenges of the present times, anthropogenic climate change, which is widely interpreted as a crisis, poses difficult challenges for spatial planning. Both at the local and supra-local levels, it has a special significance for the past and future evolution of the climate; now, in the face of acute threats, it must re-examine its areas of operation, its strategies and its tools. If we wish spatial planning to work towards a socio-ecological transformation beyond adaptation to changing climatic conditions, several fields of operation are worth mentioning, in which no less than a paradigm shift seems necessary: land use or land take, energy-related spatial planning or energy consumption, transport planning or mobility, urban planning (also in terms of protective public space), civil protection, and infrastructure planning..., the list is not exhaustive.

In these fields, the bearers of know-how can benefit from the analytical competence of sociology in order to embed the change of course in both formal and informal instruments and in social reality.

In order to understand the causes and effects of climate change, it must be considered in its social dimension. For it results from human actions while simultaneously affecting them. Against this background, spatial planning must therefore deal with the social actions of actors in their structures both past and present (e.g. the distribution of responsibility and competences) as well as anticipate future actions and developments. On the other hand, however, it must also identify the social and socio-spatial contexts and take effects into account at various scales. In this context, it is particularly necessary to address social inequalities since they determine both the ability to influence climate change and whether one bears the full brunt of it (Lessenich 2016). This consideration plays a role not only at the global level (e.g. climate flight) but also on a small scale. As an example of the latter, we may mention so-called urban heat islands, which can mainly be found in densely built-up settlements in which predominantly low-income population groups live (Chakraporty et al. 2019). In addition to the analysis of actions and effects, we must more intensively explore social and political perceptions, as well as the significance of challenges for spatial planning, since these are decisive for the delineation of a possible space for action (cf. discussions on the construction of social problems, e.g. Grönemeyer 2010).

3. CHANGE, CRISIS, OR TRANSFORMATION? A SPATIAL SCIENCE SENSORIUM FOR PROBLEM INTERPRETATION

If spatial planning wishes to (co-)shape a socio-ecological transformation, we must first ask its sense of reality: what is it actually all about? Media and political interpretations are abundant; a veritable struggle for the interpretation of data and events has flared up. At present, scientific modelling and forecasting are once again taking centre stage in the dispute. In addition to understanding the causes, forms, and spatial consequences of global warming (e.g. heavy rain, storm, or heat), the planning community also needs to understand discourse patterns in order to be able to connect and legitimise planning interventions through the right arguments.

Ulrich Beck's influential book, *Risk Society* (1987) is regarded as an early sociological examination of the field of tension between abstract environmental risks (i.e. time-delayed and with few specific local repercussions) and the concrete need for action. Since its publication, this book has also been widely adopted in planning and, for example, has influenced the field of risk management planning. Stephan Lessenich's more recent sketching of an *'externalization society'* that accepts the devastating costs and side-effects with open eyes (2016), can be understood as a provocation and criticism of current paradigms of action, including planning policies and their current arrangement into communicative procedures, making them appear as either naive, a rip-off or cynical.

Against the background of ambiguous diagnoses and weakly implemented policies to combat the causes of climate change, these authors' argumentative framework is highly relevant. In the recent past, neoliberal frames and the associated economisation and financialisation of infrastructures have brought about a constant weakening of (state) spatial planning. On the other hand, protest movements such as *Fridays for Future* and the recent electoral successes of the Greens in Austria and Germany, display the potential for insight and a willingness to change course, especially amongst the younger generation. Their sense of possibility should be taken up by spatial planning actors, who should involve them in the development of new instruments that rely on socially and environmentally equitable interventions and, thanks to these, point the way to a socio-ecological transformation (the inclusion of 'young experts' in the — transformation-oriented — ÖREK 2030 is a positive instance of this).

In addition to analytical competence, times of upheaval also require a compass that — in terms of a sense of possibility — can point the way, even if the goal cannot yet be seen. Last but not least, there has been much discussion recently about 'spatial justice'. It is clear that the negative effects and costs of climate change are not evenly distributed across all sectors of society. Rather, they exacerbate existing social and economic inequalities. This aspect is central to a planning approach that concerns itself with a socio-ecological transformation and must guide adaptation and mitigation strategies. Here, too, we must point to the multiscalarity of climate change, which requires joined-up thinking to deal with the levels concerned — in analysis, strategy, and interventions. The orientation towards social, environmental, and spatial justice entails paying attention to the various contexts of climate change production, or climate-damaging production and consumption, as well as its impact. Intersectional considerations, which point to the entanglement and interaction of burdens, constitute an important basis for sustainable and effective planning approaches. Appropriate methodologies and methods, as well as a planning theory orientation that is sensitive to the production and reproduction of inequalities, are required in order to adequately take them into account.

There are a number of possible orientations for this 'compass'. Above all, in addition to the notion of sustainability, conceptions of resilience have been under discussion for several years as guiding principles for a dynamic adaptation to climate change (for an overview, see Homagk 2019). Yet their suitability for a socio-ecological transformation must also be questioned. The notion of resilience — as regards its application in spatial planning — has been

criticised, for example, for laying an excessive emphasis on environmental risks and extreme events while at the same time neglecting social and spatial inequalities (Bürkner 2010, p. 35ff). In addition, in the context of discussions about resilience, a truncated application of scientific models and biologistic analogies has also been criticised.

Therefore, the development of a compass for planning ethics should above all be motivated by the transdisciplinary claim of planning, in order to shape pathway choices in accordance with the local reality of planning contexts — in opposition to the lure of positivist steering fantasies.

4. SPATIAL PLANNING SCIENCE FOR THE SOCIO-ECOLOGICAL TRANSFORMATION

At the time of the founding of the Sociology research unit at the TU Wien (in 1998, under the name of Institute for Sociology in Spatial Planning and Architecture), Jens S. Dangschat, tenured professor, already defined the mandate of spatial planning as *'ensuring the volatile and pervasive development of the economy, the environment, and society in space'* (Dangschat 1996). In particular, it was also necessary to shine a light on the requirements and interests of population groups who, until then, had remained unnoticed in the academic field as well as being socially marginalised. In the interest of strengthening democracy and justice, these groups should be integrated. This mandate has been maintained until today, albeit under tighter conditions.

In order to achieve a socio-ecological transformation, the above demands must be taken up in terms of knowledge and planning theory, as well as planning practice; methodologically-speaking, key words are: transdisciplinarity and collaborative urban research. For a 're-embedding' transformation, actors need a sound knowledge of interdependencies between society, the economy, and the environment. Without effective spatial planning, a profound transformation is inconceivable. Here, the actors are faced with the following choice: go along with 'business as usual' or find and activate levers for a transformation in the sense of a *'solidary modernity'* (Brand 2014, p. 11).

The experiences mentioned above in connection with the 'communicative turn' show that transformations without any targeted prioritization and, also, the courage to define normative (goal) settings hardly stand a chance to become systemically relevant. Accordingly, in conclusion, the aim from the point of view of spatial sociology is to formulate essential spatial planning assumptions that might flesh out a socio-ecological transformation and, thereby, make it possible.

Planning towards a socio-ecological transformation requires a clear positioning (including, in a broader sense, a political one). To achieve this transformation, what is missing is not so much methods and instruments as the willingness to set (legal) objectives and consistently prioritise them. Without an explicit political prioritisation of social and environmental goals, the socio-ecological transformation cannot succeed. The force of inertia of economic dominance is also evident in everyday planning. For instance, as long as we refer to social groups as 'clients', spatial planning actors will fail to understand their genuine socio-political mission as well as their steering

options. Even if the requirements for a socio-ecological transition have been on everyone's lips since the new government's term of office started, rapid structural changes in the Austrian spatial planning system are rather unlikely, which is why its instruments might retain a very sectoral character to some extent; there will still be a lack of planning levels, in-between development plans and land-use designation, which are needed, also in terms of flexibility. This makes it all the more essential for structures to be systematically and more tightly tied back to the required contents of planning. The 'old' mandate of spatial planning therefore remains entirely relevant: spatial planning is not mere administration or official regulation, but a socio-political task. In terms of scientific strategy, it therefore seems necessary to consistently pursue lifeworld-related research perspectives. The above-mentioned social space studies, an already well-established form of transdisciplinary addition to knowledge, would have to be consolidated, extended to include environmental issues, and more closely linked to practice for the purpose of mutual learning processes.

Strengthen the position of planning in communicative planning. Even after the 'communicative turn', numerous examples (in particular major EIA-relevant projects) show that planning schemes can reduce the quality of life of residents and/or those affected, and exploit nature in spite of communication efforts. Many planning schemes are still oriented towards the promise of profit rather than towards social or environmental values and goals (cf. Pernicka 2011, p. 2). The starting points for a socio-environmental alternative might involve, for example, cross-financing, as is currently the case in Paris, where a fixed proportion of investment must be provided for social and environmental measures and co-creative planning (cf. Renöckl 2019). In this way, self-organised processes within the community can be deliberately promoted, for instance through commons projects. To ensure the improvement of their quality, for example with regard to the reduction of social exclusion, consistent and, above all, independent scientific support is indispensable.

Review and transform the guidance orientations of the public sector. To achieve a socio-ecological transformation based on solidarity, the public sector must resolutely turn away from the neoliberal guiding principle of New Public Management. The model of *'embedded liberalism'* recently proposed by Andreas Reckwitz (2019) might serve as a new direction. This means a public interest orientation acting as an ordering principle through the *'revitalisation of socio-economic and socio-cultural (state) creation of order'* and targeted decommodification, especially in the areas of land and infrastructure policy, and in the energy and mobility sectors, as well as with regard to process management and forms of collaboration. This does not mean that we have to return to more authoritarian forms of governance; on the contrary, the principles of good governance — fairness, transparency, responsibility, and accountability — if they are consistently institutionalised within the planning apparatus and regulatory framework, can turn orientation towards the public interest into a guide for action. In this respect, spatial planning science could make an

important contribution by dealing more with the effects of various forms of steering and coordination, and by bringing these findings into administrative reform processes.

Strengthen transdisciplinarity and participation in spatial research. In order to ensure that the socio-ecological transformation is systemically relevant, there seems to be an urgent need to overcome hierarchies in knowledge production, which in many respects have been under-theorised. It is precisely planning-relevant knowledge production that must not only take place in appropriate research and development institutions; rather, it deploys its innovative power above all in interaction with institutions and organisations that have an impact on society. Just like space, space-related knowledge is also a public good; hence it must be developed through appropriate co-creative, transdisciplinary, inter-institutional forms of knowledge generation. If the division of labour between 'science' and 'practice', which is often mentioned in everyday life, were to be dissolved in favour of collaborative 'scientific practice', the complex spaces of potentiality of a socio-ecological transformation could be explored and shaped.

From the point of view of the sociology of spatial planning, the sharpening up of the senses of reality and possibility might help contribute effectively to overcoming the aforementioned crises in society, the economy, and the environment. In this chapter, we both shed some light on and explained that the sense of possibility, above all, is currently not highly developed. In order to mobilise social forces for a profound transformation, in addition to reflection, utopias and visions of the future are also needed. Perspective and future-oriented thinking, however, must be guided by theory and methods in order to systematically inform and orientate planning activity, and then become influential within spatial policy and administration. The Research Unit Sociology will contribute to this through teaching and research, and by providing support to planning practice.

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FOREVER YOUNG — 15 YEARS OF (T)RAUM.REGION

REGIONAL PLANNING AND REGIONAL DEVELOPMENT RESEARCH UNIT

REGION TEAM

The staff of the Regional Planning and Regional Development research unit
TU Wien

'How do we see the past, present, and future of regional planning and regional development? We asked ourselves these questions while reflecting on a synchronoptic table — the result reflects a variegated array of opinions of the research unit's staff. It is exciting to read how differently several generations of planners think about what regional planning and regional development have meant, what they mean today, and will mean to us.'

TEAM REGION

The synchronoptic table presented below is an overview of historical and future intermediate steps and turning points, both technical and personal. Not only are we looking back, we also dared to look into the future. As planners and researchers, we do shape the future.

Why forever young? We have already achieved a lot, yet would still like to achieve more, which keeps us young. In addition, working at a university with committed students and colleagues is a great privilege; it stimulates reflection, change, development, and action. In short, we just do not have the time for growing old. Milestone anniversaries always entice one to pause and take stock. We are no exception: we did this beyond the history of the (t)raum.region — on the occasion of the 50th anniversary of the launch of spatial planning studies at the TU Wien.

What has changed over this long period of time? We compiled events, instruments, attitudes, and activities with a spatial character into a synchronoptic table. This list is not intended to be exhaustive: in this yearbook, we can only reproduce a short extract of the chronological table, which would fill an entire wall. Of the almost 1,000 entries (as of July 2020), we selected around 20%, which we considered to be important for the references and relationships between space, regional planning, and regional development in general, and for our research unit in particular. What were the milestones — important projects, legal provisions, publications, and plans? But, also, which events, artworks, and literature have particularly influenced us? How do they relate to the *zeitgeist* of planning and the planning culture of the last half-century? What are they rooted in? At the same time, we wondered about what might happen in the coming ten years — the field of study will then be 60 years old and the (t)raum.region 25. We cannot know about it, but this is precisely what motivates us to think about space in the future — this anniversary year is also underlain by some dream of the future, which may help us backcast to the present from the future and set up new, targeted activities.

How do we see the past, present, and future of regional planning and regional development? We asked ourselves these questions while reflecting on the synchronoptic table — the result reflects a variegated array of opinions of the research unit's staff. It is exciting to read about how differently several generations of planners consider what regional planning and regional development have meant, what they mean today, and later will mean to us.

The following data are a foretaste of a large chronological table on regional planning and development that is being prepared in the research unit. The timelines presented here and the synchronoptic representation cannot, and do not make any claim to completeness. For this reason, we wish to convert the currently static version (Excel file) into a freely accessible, interactive version on the World Wide Web. This will greatly increase visibility and ensure that the records can be easily maintained and, as is appropriate for a synchroptic table, can be expanded in future.

Tab. 1 A selective chronological table of regional planning and development in Austria up to 1970

1814	Stand Montafon
1854	Invention of the planimeter
1920	Land-use plan in the Vienna Building Code
1930	Maps of settlement forms by Adalbert Klaar
1937	First Provincial Planning Act (not implemented), Upper Austria
1938 – 1945	National Socialist Party (NS) spatial planning
1946	Land Use and Development Plans Act, Styria
1950	Adalbert Klaar teaches 'Settlement Studies and Spatial Planning' at the University of Vienna
1951	Founding of the Association of Austrian Planners; dissolved in 1957 following protests by municipal officials
1952	First instance of regional planning: draft regional zoning plan for the Wörthersee
1954	Verdict by the Constitutional Court: spatial planning is a matter for the states and a cross-cutting issue Civilian expansion of Vienna Airport Foundation of ÖGRR (Austrian Society for Spatial Planning; formerly ÖGLL, then ÖGR)
1955	State Treaty, withdrawal of occupying troops
1956	First Spatial Planning Act in Austria: Salzburg Doris Day: Que Sera, Sera
1958	First instance of regional planning in Lower Austria: development of zoning plan for the Marchfeld
1959	Austria has 7 million inhabitants Ybbs-Persenbeug Danube power plant Appointment of Prof. Wurzer to Urban Planning and Spatial Planning at the Technical University Vienna, today's TU Wien
1960	First instance of regional planning in Salzburg: drafting of development plan for the Lungau
1961	First regional development programme in Austria enacted through legislation: Lower Carinthia Lake District Roland Rainer: basic urban development scheme for Vienna Kramergasse pedestrian zone in Klagenfurt
1962	ecoplus, Lower Austria Economic Agency
1965	190 cars/1,000 inhabitants in Austria Ministerial Committee for Regional Planning The Beatles: Nowhere Man
1967	Garden City of Puchenau
1968	Drafting of Provincial Development Programme for Burgenland
1969	First human being on the Moon

Source: own compilation.

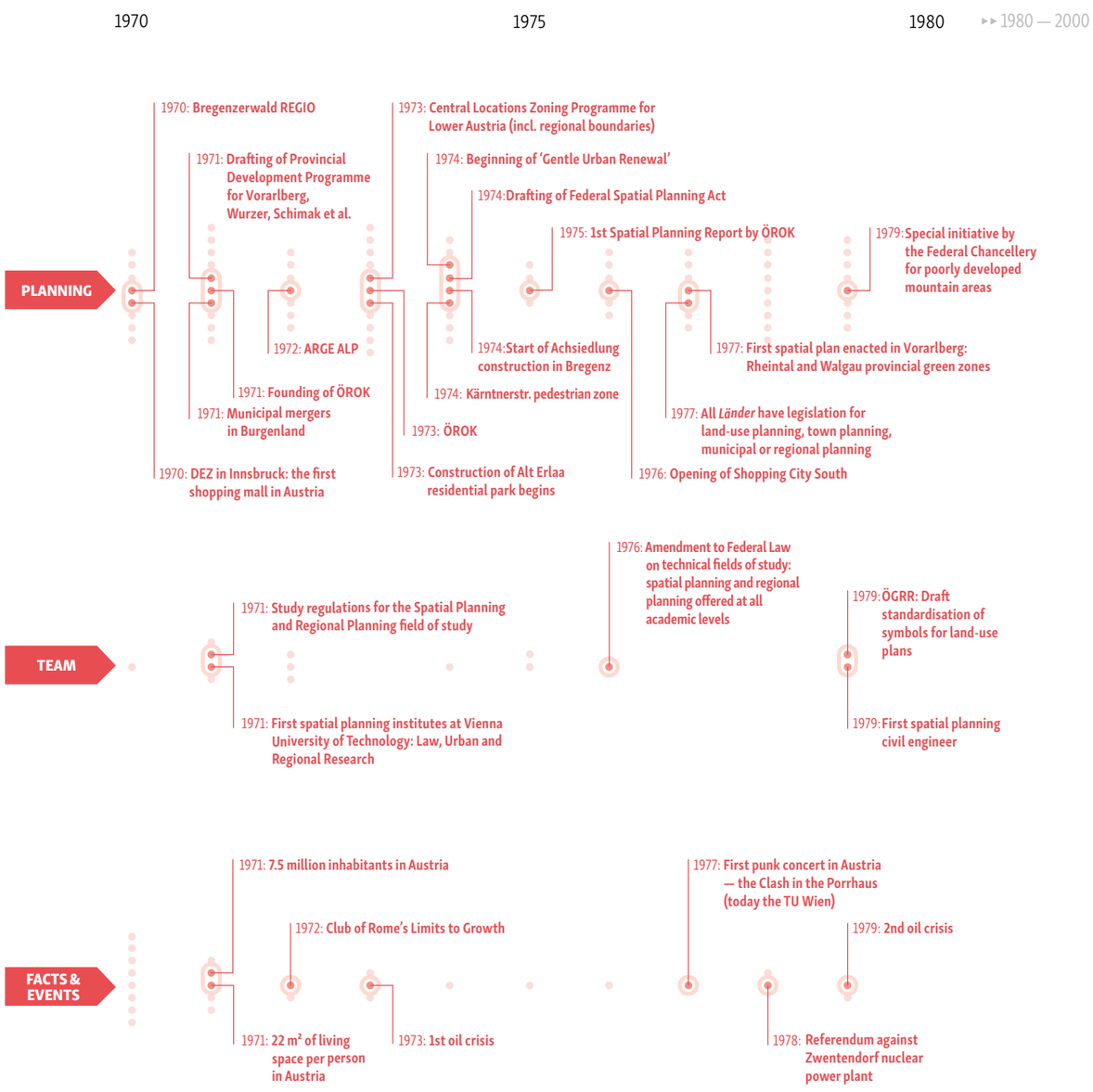

Fig. 1 Regional planning and development in a temporal context — a synchronoptic table from 1970 until 1980. Source: own compilation.

◂ 1970 — 1980 | 1980 | 1985 | 1990 | 1990 | 1995 | 2000 | ▸▸ 2000 — 2020

PLANNING

1981: Cable car and ski slope scheme for Tyrol + recreational space scheme for Tyrol

1981: Landscape framework plan for Danube wetlands, Altenwörth (Vienna)

1982: Waldviertel Reg. Management

1984: Eastern Region Transport Authority (VOR)

1985: Village renewal, Lower Austria

1987: Completion of Danube Island (Vienna)

1988: Golf course scheme for Tyrol

1989: Hagenberg Software Park

1981: Austrian Spatial Planning Concept

1983: Research initiative against forest dieback

1989: First regional zoning programme in Lower Austria: surroundings of Vienna

1981: Hohe Tauern, Austria's first national park

1987: SAGIS (first *Land*-level GIS)

1991: Austrian Spatial Planning Concept 91

1992: Nine regional associations — independent planning levels in Salzburg

1985-93: 'Plus Minus'

1994: Settlement policy scheme for eastern region (PGO)

1994: Expansion of wind power plants begins

1996: Weiz-Gleisdorf energy region

1998: Upper Austria starts generating digital colour orthophotographs

1998: Freudenau power plant

1999: ESDP

1995: Interreg II A-CZ, A-H, A-SLO

1995: Burgenland Regional Management

1999: Founding of LandLuft association

1991: LEADER

1991: Alpine Convention

1994: Tyrolean Land Procurement Fund

1994: AA4 East motorway

1998: Schindegger, Friedrich: Space. Planning. Policy. A manual for spatial planning in Austria

1991: Cancellation of EXPO VIENNA

1993: Regional Management / EUREGIO WEINVIERTEL

1993: UOG amendment: room for manoeuvre and more autonomy for universities

1995: P3 Israel-Jordan; cross-border urban and regional planning

1991: 1st female Professor of Spatial Research and Planning, Gerlind Weber, BOKU Vienna

1994: 1st student project in collaboration with foreign university, cross-border regional planning for the South Moravian region and Lower Austria's Weinviertel

TEAM

1987: Founding of AESOP, Association of European Schools of Planning

FACTS & EVENTS

1980: Einstürzende Neubauten, techno

1981: 1st IBM PC

1981: 28 m² of living space per person in Austria

1984: Unleaded petrol available for the first time in Austria

1984: Occupation of Hainburg wetlands

1985: Live Aid, USA for Africa: We are the World

1985: Gender Mainstreaming World Conference on Women in Nairobi

1986: Nuclear meltdown in Chernobyl

1987: Brundtland Report

1988: Lowest population count in Vienna in the 20th century, 1.48 million

1989: Fall of the Iron Curtain

1990: Piefke Saga Tirol I (a TV series)

1991: 7.75 million inhabitants in Austria

1991: 33 m² of living space per person in Austria

1991: Outbreak of Yugoslav Wars

1992: Founding of Blue Lagoon, the largest prefab house centre in Europe

1993: 'Sea of lights' against xenophobia

1994: 1st GSM grid in Austria

1995: Accession of Austria to the EU

1997: Kyoto Climate Conference sets binding emission targets for the first time

1998: Hinterholz 8, a film by Harald Sicheritz

1999: Equality is a fundamental right (Treaty of Amsterdam)

Fig. 2 Regional planning and development in a temporal context — a synchronoptic table from 1980 until 2000. Source: own compilation.

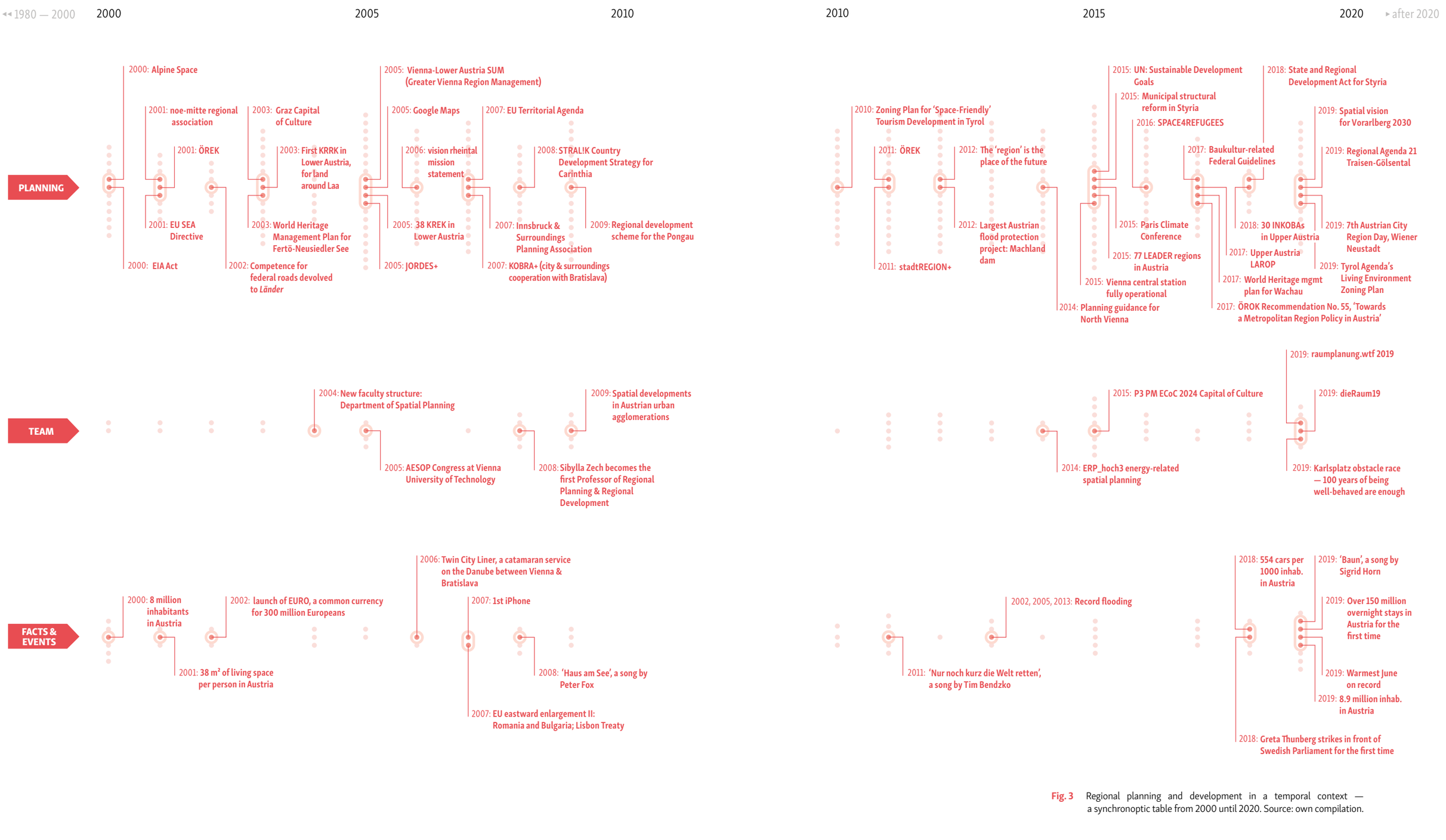

Fig. 3 Regional planning and development in a temporal context — a synchronoptic table from 2000 until 2020. Source: own compilation.

Tab. 2 Outlook — vision and reality from 2020

2020	Investment for growth and employment (IWB/ERDF) 2014–2020 Specialised term: focal points of urban life / polycentric Vienna *Rettet das Dorf*, a film by Teresa Distelberger 6,600 klimaaktiv-mobile projects since 2004 P3 making Karlsgasse COVID-19 pandemic, shutdown from March COVID-19 closure of universities, switch to distance learning Römerland Carnuntum online conference platzfuer.wien initiative Planners4Future Black Lives Matter demonstrations Exhibition and publication on female Planning Pioneers Provincial Development Programme for Upper Austria Baukultur municipal prize for *Boden g'scheit nutzen* ('land use, the clever way') with around 100 submissions
2021	regREK Montafon 1st energy-related spatial plan: e3 Bruck a.d.L. Austrian spatial development scheme ÖREK 2031 Austrian Federal Government adopts a surface unsealing programme: 60% subsidy for ground reclamation; at the same time a sealing levy is introduced Lower Austria Development Scheme *Piefke* Saga Part 5 (TV series)
2022	MORE: the federal government supports 22 spatial development model projects Construction of 3rd runway at Schwechat (Vienna Airport) is cancelled Opening of the Karlsgasse after redesign on the initiative of the Regional Planning and Regional Development research unit
2023	Austria has 9 million inhabitants Opening ceremony of the REGIONAL *landumstadt* City of Vienna-Lower Austria Inner-city development instead of building on green meadows — rules for the absorption of planning proceeds Rural Areas are awarded a chair at the TU Wien
2024	Bad Ischl-Salzkammergut European Capital of Culture
2025	ESDP 2: Second European Spatial Development Perspective with the active participation of the seven new Member States 50% of mayoral office staff are women
2026	Vacant property levy takes effect Petrol and diesel vehicles are banned from public space
2027	Semmering Base Tunnel comes into operation Vienna exceeds historical population peak (2.1 million)
2028	Federal Spatial Planning Act passed Daily land use drops below 2.5 ha (target value of the sustainability strategy 2002), Austria is European champion in ground reclamation
2029	Structural reform: 1001 municipalities, instead of current 2095, in Austria
2030	Half-hourly public transport frequency in every Austrian village National Energy-related Spatial Plan adopted The Spatial Planning field of study celebrates its 60th anniversary at the TU Wien The Regional Planning and Regional Development research unit is 25

Source: own compilation.

STANDPOINTS ON THE REGION — A VIRTUAL DIALOGUE OF THE SPATIAL PLANNERS TEAM AT THE REGIONAL PLANNING AND REGIONAL DEVELOPMENT RESEARCH UNIT

THE UNDER-GRADUATES
Elias GRINZINGER
Theresa JANESCH
(studying)

THE PREDOCS
Isabel STUMFOL
Daniel YOUSSEF
(studied in the 2010s)

THE POSTDOCS
Nina SVANDA
Thomas DILLINGER
Petra HIRSCHLER
Hartmut DUMKE
(studied in the 1990s)

THE SENIORS
Sibylla ZECH
Gerhard SCHIMAK
(studied in the 1980s/1970s)

THE MODERATOR
the unknown interviewer
(in italics)

You are prospective spatial planners or have recently entered the professional field: why are regional planning and regional development your future horizon?

Elias Grinzinger: Regional perspectives can only gain in relevance in the future in view of the increasing proportion of the population living in urban regions, changes in the world of work and, not least, the challenges of the climate crisis.

Theresa Janesch: Yes, indeed; regional planning and regional development are becoming more and more relevant owing to climate change, because they have the big picture in mind.

Daniel Youssef: Generally-speaking, they will gain greater recognition and relevance for solving current and future complex challenges faced by society, which require a holistic approach, and will thus make a significant contribution to a more nature-friendly way of life. This has a significant impact on coordinated and efficient land use beyond municipal boundaries, aiming to achieve a balance of interests, which is a basic principle for the acceptance and implementation of sustainable spatial development. Interdisciplinary methods or spatial planning working methods are to be used in a transdisciplinary way within a regional context in order to be able to design the living environment according to the highest environmental, economic, and social quality criteria.

Isabel Stumfol: In short: regional planning and regional development will learn to rethink regions in order to equip the world to face all challenges and to attend to them with heart and mind.

Is this only something for the future or can you already see and feel some of it happening?

Isabel Stumfol: Yes, I certainly can! Regional planning processes have made the world of collaboration, communication, and cooperation in Austria more varied and successful. Regional planning and regional development provide a basis and opportunity for creative, multifaceted, forward-thinking projects led by a wide variety of project thinkers and project doers.

Theresa Janesch: That means crossing boundaries and achieving something together.

Elias Grinzinger: Exactly, because we know that social interdependencies rarely stick to administrative boundaries. Yet even though regional planning and regional development span an essential competence area as regards the management of land-use claims and conflicts, in reality this is sometimes underestimated.

You are amongst the pioneers of regional planning and regional development in Austria and have helped shape the field in teaching, research, and practice.
How do you see this policy field in retrospect?

Sibylla Zech: Austria has been at the forefront of endogenous regional development since the 1970s. Furthermore, accession to the EU in 1995 and the use of EU funding programmes brought about successful regions and also interregional cooperation. Binding regional planning has been approached rather hesitantly, at least in some *Länder*. The reasons may lie, on the one hand, in the short history of the Republic, during which municipal autonomy and federalism have been particularly highly regarded. At the same time, paradoxically, the willingness of the *Länder* to shape spatial development was limited: management was delegated to cooperation between municipalities. The strategic linking up of regional planning with regional development has only been successful in a few cases.

Gerhard Schimak: Through diverse strategies, regional planning and regional development have created the legal, institutional, and instrumental framework that underpins and promotes endogenous regional development. Today, efforts are being made within participatory processes to develop the identity and branding of regions and thus to stimulate the commitment of regional players.

Sibylla Zech: The Austrian legal and administrative framework and, even more, practice are characterised by a wide range of platforms, instruments, mission statements, and projects that are geared towards a sustainable design of our living and economic space. Numerous creatively designed planning processes show that regional actors increase awareness of 'their' region, develop a common understanding of its development opportunities and, ultimately, turn the region into a common planning and design space.

What will the future bring?

Sibylla Zech: The future belongs to the regions. Today, we cross the boundaries of the 2,095 Austrian municipalities every day — when we go to work, to school, shopping, or to the doctor, to practice sport or visit friends. A new quality of public services and regional identity will be grounded in the combination of a new municipal structure, with around 1,000 municipalities, and work within cooperation areas that implement planning according to need and with pinpoint accuracy.

Gerhard Schimak: It will take a lot of creativity to develop new forms of participatory, organisational, and institutional processes within policy advice for a better and more liveable future for the population.

You are in the middle of your professional careers, have asked regional research questions and set planning tasks in your dissertations and many projects.
How do you see current challenges?

Nina Svanda: ROf all planning levels, regions best represent people's everyday space. This was painfully demonstrated during the COVID crisis, for example if the doctor was not allowed to come from the neighbouring municipality, or if the Viennese were prohibited from having a rest at the nearby Lake Neusiedl. Regional planning and regional development have an essential significance for people's everyday lives, but are underrepresented in the awareness and actions of the political and administrative spheres. Hopefully, by learning from the experience of the COVID crisis, they will become a stronger instrument in the fight against the climate crisis.

Petra Hirschler: I would like to present a positive picture; in retrospect, regional planning and regional development have organised land-use claims while avoiding conflict. They are shaping the spatial future now and will continue to do so in the coming decades, while also paying even more, lasting attention to social values, protecting resources, and contributing to sustainable development.

Thomas Dillinger: At first, regional planning was very much influenced by spatial planning notions. It was Austria's accession to the EU that particularly brought to the fore the spatial development aspect. Access to European funding has led to numerous regional initiatives, projects, and programmes, and has made a significant contribution to the positive development of regions within Austria and Europe. In the current Austrian planning system, regional planning and regional development have reached their limits. Not only do we live in a globalised world, but also a highly regionalised one. As a result, new questions regarding the design of our living environment have arisen. Austrian regional planning has not yet provided the right answers. Often, the answers were not heard or not correctly understood by planning policymakers either. Despite numerous efforts and initiatives, they cannot ensure the coordination of spatial development that is needed in Austrian regions. Regional action will have to grow in importance in order to meet the challenges of the future. The regional planning level must be given a stronger mediating role between provincial and local planning. To this end, the anchoring of regional planning in the planning system must be reconsidered and innovative instruments developed. Regional planning 4.0 is needed!

Hartmut Dumke: In short: regional planning and regional development have (a) had a hard time, (b) are legitimate and (c) will have to be taken for granted.

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LAND POLICY AND LAND MANAGEMENT
A new research unit at the TU Wien

LAND POLICY AND LAND MANAGEMENT RESEARCH UNIT

Univ.-Prof. Dipl.-Ing. Dr.
Arthur KANONIER

'It is very important to the state that immovable goods, and more generally the land of the country, should be used in the best possible way' (von Justi 1760, p. 120).

1. INTRODUCTION

The Land Policy and Land Management research unit was set up in April 2015 at the Faculty of Architecture and Planning of the TU Wien and assigned to the Institute of Spatial Planning as its eighth research unit. With the founding of this research unit, the TU Wien and the Faculty of Architecture and Planning deliberately decided on a thematic and technical expansion and prioritisation in order to meet increasing challenges, for teaching and research, connected to land use and the distribution of land-related use options. Against the background of climate change and continuing high land take-up, the number of tasks dealing with land-use (planning) that require more intensive academic activity will continue to increase.

Even though the research unit at the TU Wien was set up recently, the topics of land policy and land management have a long history (see introductory quote) and have been at the core of teaching and research contents since the field of study was founded fifty years ago. Without going into the long history of land policy research and teaching at the TU Wien, in particular at the Institute of Law (cf. Straube & Siegen 1984), it should be noted that Prof. Josef Kühne — who, in his main work: Land Law, the Economic and Social Significance of the Land, pointed out the *'close connections between land planning and spatial planning'* (Kühne 1970, foreword) — and his staff have been dealing extensively and continuously with land law and policy issues since the 1970s. Accordingly, the orientation of the newly founded research unit was facilitated by the fact that Institute of Law staff at the TU Wien had previously been involved with spatial and land law issues. Thus, specialised technical and institutional knowledge made it possible to rapidly establish and build up teaching and research, along with extensive collaborations.

Given that the research unit has been permeated with legal issues since its founding, its priorities — besides land policy and land management — also lie on landholding allocation, spatial planning, and building law issues. Both in teaching and research activities, political and technical decision-making logics, processes, and actions connected with the use and exploitation of land occupy the foreground. The technical priorities lie on the tension (in terms of property rights) between the public interest (common good) and private concerns in relation to land and use, whereby restrictions on the fundamental right to property for public matters are generally discussed (or questioned) on a case-by-case basis. Against the background of the increasing diversity of interests, instruments, and procedures, steering mechanisms, and their limits, for governmental instruments and measures are subjected to particular attention in order to devise improvements. More specifically, the following topics have been covered by the research unit's research and teaching over the past five years (Kanonier et al. 2020, p. 7):

'Land policy and land management are obviously complex, many-layered issues that are highly topical in spatial planning and social terms. Discussions on the availability of building land, the excessive take-up of land or the avoidance of conflicts of use caused by diverse forms of use are as present in media coverage as they are in scientific discourse.'

A. KANONIER

- Official spatial planning instruments and measures at all planning levels
- Land availability and 'mobilisation' of building land
- Reducing land take and preventing urban sprawl
- Criteria and (balancing of) interests in official planning measures
- Contributions of spatial planning and landholding allocation to affordable housing
- Planning approach to infrastructure and commercial facilities, as well as shopping centres and,
- Planning procedures, participation, and legal protection options.

These priorities are complemented by current challenges, such as climate change and natural hazards management, spatial energy planning or alpine spatial planning, whereby the research unit primarily contributes expertise on land and spatial planning policy as well as on legal aspects of spatial planning.

2. LAND POLICY AS AN IMPORTANT SUBJECT AREA FOR SPATIAL PLANNING

Land policy is a broad and comprehensive subject area if it is understood to generally mean *'the totality of all instruments, actions, and decisions by public authorities that directly or indirectly affect land protection or use'* (Walter & Hänni 2018, p. 89). The 'land issue' addresses the topic of making land available for various use claims under reasonable conditions (Weiss 1998, p. 324), whereby we can derive two sub-questions falling under the use and distribution functions (Hengstermann 2018, p. 28): how can land be made available for particular uses and how should the benefits and drawbacks resulting from land use be distributed? In land policy, designation and distribution are therefore essential differentiating features, whereby in this policy sector designation denotes what a piece of land is used for, whereas distribution means: by whom the piece of land is used, in other words, who enjoys the advantages of this land use and who has to suffer its disadvantages (Davy 2006, p. 30 and p. 32). Under a responsible land policy, the designation of uses and the distribution of benefits and drawbacks are guided by coordinating and balancing the most diverse interests (Davy 2018, p. 267).

The technical connection with spatial planning — *'the totality of the measures and activities of public bodies* […] *whose object is the configuration of localities on the basis of political objectives'* (ÖROK 2018, p. 10) — is particularly close, whereby land, from a planning perspective, may be considered from at least the following three dimensions: 'landholdings' (rights of disposal and use), 'property' (value and gains derived from use functions), and 'environment' (use and preservation of natural land functions) (Davy 2006, p. 20; Hengstermann 2018, p. 24). At the level of objectives, there are considerable synergies between land policy and spatial planning, especially since the economical and efficient use of land is a core concern of both spatial planning and land policy. At the level of measures, land policy forms the interface between the development intentions of spatial planning and the (exploitation) interests of landowners (Davy 2006, p. 28). If land-related rights of disposal and use in planning areas are insufficiently protected by public authorities, the implementation of planning development doctrines is usually endangered or impaired. As a result, ensuring the availability of land is increasingly a central concern, in particular for municipal planning authorities, given increasingly complex property rights or rights of disposal and use (Hengstermann 2018, p. 29).

Land policy and land management are obviously complex, many-layered issues that are highly topical in spatial planning and social terms. Discussions on the availability of building land, the excessive take-up of land or the avoidance of conflicts of use caused by diverse forms of use are as present in media coverage as they are in scientific discourse. Since the founding of the research unit, the emphasis on this cluster of topics has been built up and intensified in planning education and research at the TU Wien's Institute of Spatial Planning.

Research

The research unit complements the Institute of Spatial Planning's existing research units and builds on the many years of research and teaching experience of its staff. In principle, both research and teaching have been and will continue to be interdisciplinary, while exchanging ideas with colleagues and the public has been pursued through meetings, conference participation, etc. An international orientation and, at the same time, the embedding of the Austrian dimension in the European context, as well as cooperation with Tongji University thanks to the 'Double Degree Programme' are important matters for the research unit (Kanonier et al. 2020, p. 21).

Core topics of the research activity are land availability, building land 'mobilisation', urban sprawl prevention, etc., which are mainly dealt with in cooperation with the Austrian Conference on Spatial Planning (ÖROK). For example, it was possible to make a substantial contribution to the recommendations on 'land-take reduction, land management and land policy' (ÖROK 2017). Cooperation with ÖROK has also taken place within the framework of other ÖREK partnerships and in connection with the preparation of specialised publications (e.g. Raumordnung in Österreich [Spatial Planning in Austria], ÖROK 2018).

Another research priority involves projects on concrete issues around the design and application of planning instruments (e.g. parking space regulation, holiday home quotas, or regulations governing shopping centres). Here, we can see that various types of local authority, such as cities and provinces, appreciate and demand external advice on current land policy and planning law issues with a high degree of practical relevance.

In recent years, the Constitutional Court (VfGH) has increasingly dealt with planning descriptions in enacted spatial plans, whereby in each case the subject of review was the planning accuracy in the presentation of various zoning plans in their statutory form. The Constitutional Court considers that, for various reasons, the requirements of the rule of law are not sufficiently taken into account. In 2019, in a study commissioned by ÖROK, the research unit examined not only the legal regulations governing plan descriptions and requirements for accuracy in relation to various legal matters but, also, the specific Supreme Court case law and the challenges involved in the use of digital maps, before formulating recommendations accordingly.

In the field of natural hazards management, the research unit worked, primarily with the Alpine Convention and EUSALP, on a study of the status quo concerning risk governance on the basis of specialist publications (cf., amongst others, Kanonier & Rudolf-Miklau, 2018); it has taken the lead in drafting the current Alpine status report of the Alpine Convention. Projects for planning-related improvement to natural hazard management have regularly been conducted with the ÖROK and with *Land*-level bodies in charge of hydraulic engineering, and torrent and avalanche control. The commissioned research project 'baubehoerde.at' deals with the digitisation of building authority procedures and is closely interlinked with omnipresent political efforts to digitise public management. In the Urban MoVE project, it provides expertise on the possibilities and limitations of mobility agreements. Within the framework of the COST programme, the research unit is also involved in two ongoing COST actions. In connection with natural hazards, the central questions revolve around the conflictual topics of flood retention on private land and the communitisation of planning gains.

Teaching

The research unit attaches considerable importance to the TU Wien's principle of research-led teaching. In addition to the methods specified by the study plans of the TU Wien, links to current research projects and socio-politically relevant topics are established through specialised and optional courses, and are conveyed through the involvement of representatives from the civil service, politics, and planning practice in specific seminars that have relevance for implementation. Structurally-speaking, the educational emphasis rests on the Bachelor's and Master's degree programmes in spatial planning, supplemented by teaching contributions concerning other fields of study at the TU Wien. In teaching, land and spatial planning-specific content has been newly developed and existing teaching methods continued. In recent years, internationalisation has received greater emphasis: the range of English-language courses in the research unit has been expanded (Kanonier et al. 2020, p. 59).

In the field of teaching, the research unit was, and still is, represented in both the Bachelor's and Master's degree programmes in spatial planning. Teaching on the fundamentals of land and spatial planning law, and selected areas of land policy and land management, as well as in-depth studies in area designation and development planning are among the essential contents of the compulsory subjects supervised by the research unit. In addition, courses on natural hazards, tourism, and spatial energy planning are offered in accordance with the teaching staff's interests and fields of research. It goes without saying that teaching cooperation with other research units of the faculty and with other universities takes place. In this regard, practical relevance is always important: on the one hand, experts from research networks are actively involved and, on the other hand, issues are worked out through dialogue — between students and planning managers and experts — in the context of field trips. The focus is on international destinations; in addition to Ireland, Scotland and Sweden, it was also possible to organise an exchange with administrative bodies and universities in Russia.

A number of courses on special topics related to research and events have also been offered; wherever possible and useful, collaboration with lecturers and the involvement of students from the field of architecture are encouraged. We may mention the following examples: the Urban Regeneration Project for the Calidonia District in Panama City, which was jointly supervised by the institutes for urban design and building in 2016; courses associated with the Archdiploma 2017; or a draft module for the planned adaptation of the Ottakring brewery in the 16th district of Vienna. Bachelor's and diploma seminars enable students to examine relevant land policy issues, the results of which are regularly incorporated into Bachelor's and Master's theses. In architecture, civil engineering, geodesy and (more recently) environmental engineering, basic knowledge in the field of spatial planning and land policy, or else in construction and planning law, is also conveyed within the framework of compulsory subjects.

3. LAND POLICY CHALLENGES

The basic framework conditions for land policy measures are, on the one hand, the limited availability of land resources, which are characterised by a scarcity of space for permanent settlement and, on the other hand, the diverse, increasing land-use claims, as illustrated by the persistently high land take-up. In total, around 39% of Austria's land surface is to be regarded as permanent settlement area, including space available for agricultural settlement and transport facilities (Statistik Austria 2019); of this, around 16% is used for settlement purposes (Amt der Oö. Landesregierung [Office of the Upper Austrian State Government] 2020, p. 11). Owing to natural conditions, suitable areas for potential settlement activities are unevenly distributed amongst the *Länder;* for instance, the permanent settlement area in Tyrol only amounts to 12.4% of the province's surface. In about sixty Austrian municipalities, permanent settlement space has a maximum 6% share of municipal land and in ten municipalities it is less than 2%; the Tyrolean municipalities of Gramais (with 0.37%) and Kaisers (with 0.79%) display the lowest values (Statistik Austria 2019, *Dauersiedlungsraum der Gemeinden* [Permanent Local Settlement Areas]).

Although land take-up across Austria (around 13.2 hectares per day in 2019) and sealed ground ('The sealed proportion lies between 32% and 41% of annual land consumption', Umweltbundesamt 2020) have tended to go down over the years, they are still (significantly) high. The continued expansion of settlement areas and the emergence of fragmented built-up areas make it clear that essential spatial planning objectives with regard to an economical land consumption are difficult to implement. It remains to be seen whether the 2020–2024 government programme, which calls for land take to be kept as low as possible and its daily increase to be reduced to 2.5 hectares by 2030 and, 'in the medium term, [to compensate] additional soil sealing by unsealing other areas accordingly' (Federal Chancellery Austria 2020, p. 104) can actually be implemented.

A thrifty management of land and, more especially, protection against urban sprawl, have long been amongst the central concerns of spatial planning, in particular of (land-)use planning at the local, regional, and *Land* levels.

Supra-local and local spatial planning are to apply various instruments and measures to achieve spatial planning target values concerning settlement developments reducing land take. Hereby, on the one hand, restrictive land-use stipulations can curb construction work; on the other hand, spatial planning measures such as those needed for the 'mobilisation' of building land, inner-urban densification or the revitalisation of brownfield sites within the existing stock of building land, can be used to reduce settlement pressure through more efficient uses for inner-urban locations. Above all, in recent years, and in connection with climate change, varied but generally more restrictive provisions have been taken up in spatial planning legislation in order to reduce land take-up and urban sprawl.

The diversity of rules in legal provisions against the hoarding of building land is particularly evident, whereby making privately-owned land available for public purposes is one of the core concerns of land policy (Davy 2006, p. 11). The (new) spatial planning measures for the 'mobilisation' of undeveloped building land — *'The proportion of designated, undeveloped building land in total building land is on average 26.6 per cent'* (ÖROK 2017, p. 9) — illustrate the variety of regulatory clauses in planning law and can be differentiated in several ways (Kanonier 2020, p. 122):

- Public law or private law measures or coercive measures, performance management measures or informal awareness-raising measures
- *Land*-wide or municipality-wide scope or individual, case-by-case stipulations
- Duty of implementation or enabling power for municipalities
- Detailed content requirements through spatial planning law or (far-reaching) discretionary power as regards content of concrete design
- Application to existing or to be newly designated building land, or to the entire building land, residential building land or specific areas (e.g. densification zones).

The variety of control mechanisms makes it clear that, owing to the diversity of cases, there is not a single instrument that alone would be effective against the hoarding of building land and might eliminate all building-land hoarding problems (Doan 2019, p. 81). Arising from the spatial planning law's long-term objective, namely, not to let undeveloped building land be hoarded in future, but instead let it be used in accordance with designations, a wide range of instruments has been enshrined in law in recent years (Kanonier 2020, p. 122) — each for specific areas of application and modes of action:

- **Private sector measures, in particular contract-based spatial planning:** since the amendment to the Vienna Building Regulations in 2014, all *Länder* have created a legal basis for spatial planning-related agreements between municipalities and landowners, in particular in order to contractually secure the rapid use of building land in accordance with designation requirements and thus promote the 'mobilisation' of building land.
- **Time limitation for designated building land:** some spatial planning laws provide for construction deadlines when designating building land. If no development in accordance with the plan is carried out by the deadline, sanctions are provided for, such as the option of modifying the plan, the invalidation of the designation without any compensation, or imposing charges.
- **Collection of charges:** in some *Länder*, statutory charges may be imposed on undeveloped (over a long period) building land; thus, the hoarding of building land is a financial burden.
- **Purchase of real estate, creation of land funds:** in recent years, either local authorities themselves or outsourced legal entities have become increasingly active on the land market in order to secure, amongst other things, disposal rights for developable real estate ('active land policy').

An additional instrument that has a building land 'mobilisation' effect is the reapportionment of building land, thanks to which areas whose purposeful development has been prevented or significantly impeded owing to an unsuitable plot arrangement can be restructured. As a rule, the preconditions set by land law for meaningful uses applying to large properties can be improved through a building land reallocation, which is often a prerequisite for the realisation of construction projects (Kanonier & Schindelegger 2018, p. 121). The reapportionment of building land — even against the will of individual landowners — is legally enshrined in several *Länder,* whereby it is to be expected that the reorganisation and restructuring of plots of land as a prerequisite for the realisation of housing schemes will gain in importance in planning practice.

A comparatively new topic in official spatial planning with a large land component is to do with affordable housing: as a result of price and cost trends in the housing sector, the question of affordability, in particular of building land and plots of land, is acquiring an increasing significance. Some spatial planning laws provide for special designation definitions as regards residential construction eligible for subsidies; thereby, this (special) designation reserves the relevant areas for specific forms of housing which, as a rule, must comply with the provisions of residential construction subsidies legislation. In 2018, the 'Area for subsidised residential construction' category was introduced in Vienna, whereby land values are limited to €188 per gross m², aiming to cap land prices.

Spatial planning law makes no direct provisions for expropriation by municipalities for the purpose of building land 'mobilisation' or for affordable housing. However, some land-use planning laws do contain expropriation provisions for developments in the public interest; in this regard, Vienna is the only *Land* whose building regulations provide for expropriation if a high-value property is not used in accordance with building regulations. As regards earmarked areas in Burgenland and Lower Austria, which can be assigned to construction schemes for public purposes, or ground areas for public purposes in Vienna, expropriation clauses are also provided for in the Spatial Planning Act or buildung regulations. In principle, expropriation is the last resort for the acquisition of the property concerned and, in any case, is preceded by milder interventions (Pallitsch et al. 2017, § 22 NÖ ROG, p. 1325). In addition to constitutional restrictions, the use of expropriation in Austria gives rise to deep political misgivings. The political will to take aggressive coercive measures is generally weak — even in cases where

a plan-compliant implementation would be justified by a significant public interest — most particularly in the case of expropriations. There are no known cases of expropriations for earmarked areas, urban planning purposes or land procurement (under the Land Procurement Act), in contrast to expropriations in connection with infrastructure projects which, at heart, makes expropriation regulations with reference to spatial planning 'a dead letter'. It remains to be seen whether complete disregard for expropriation options connected with the implementation of spatial planning specifications will continue to be consistent in the future (Kanonier 2020, p. 134).

The inner-urban development of municipalities is seen as a future challenge for sustainable settlement structures in Austria. In this regard, various trends in terms of spatial structure both inside town and city centres (hoarding of building land, vacant properties, low re-use of brownfield sites) and outside them (shopping centres, housing estates, etc.) have resulted in these losing their original function as a spatial, societal, and social centre. The extensive local spatial planning regulations for town and city centres deal with settlement centres, central zones, core zones or densification zones; various planning law requirements apply, such as facilities for shopping centres, minimum building densities, special sanctions for the hoarding of building land or the obligation to conduct development planning. If we compare the regulations applying to local and urban cores in Austrian spatial planning law, we can clearly observe a diversity of steering approaches, with landowners increasingly being required to discharge their duties.

With regard to the steering of the various land-use functions, we can detect a trend towards more complex use specifications in terms of content and structure. In local plans, 'straightforward' building land designations without any planning law obligation or agreement have become something of a rarity. The increased planning 'outreach accuracy' and implementation orientation in building land designations has made land-use planning much more demanding; hence contractual agreements, time limits or (development) conditions are often common in the building land sector. In addition, in particular in the case of special uses for building land, such as shopping centres, large accommodation providers or second homes, the specific content requirements have increased in complexity and are often susceptible to change, which does not always facilitate practical application and interpretation.

Use categories in land-use planning are tending to become more strongly differentiated and thus increasingly detailed land-use specifications are binding, although specific legal effects and designation criteria are not always defined sufficiently precisely.[1]

In particular, the large number of special areas on building land or greenfield sites which, in some cases, only allow specific uses, results in dissimilar requirements in the planning procedure and, subsequently, in the construction method.

On the one hand, binding land-use planning deals with existing stock; on the other hand, it is increasingly project-related and no longer defined in a general sense for the long term: only after a specific proposal has been submitted will project-related basic research and specific planning stipulations follow; these, to an increasing extent, are then supplemented by civil-law agreements (contract-based spatial planning) (Kanonier & Schindelegger 2018, p. 113). Reasons for project-related designation decisions include the fact that traditional land-use planning, on the one hand, proved to be too inflexible and, on the other hand, too generic. The various special requirements stemming from the size, mode of use, and impact of projects cannot be satisfactorily controlled through a building land commercial area designation alone. Thus, this results in case-related project designations, especially if we also take into account the fact that the definition of special areas is not (or no longer) a unilaterally official procedure, but takes place in close consultation with investors and other concerned parties. In urban areas with a high demand for building land, it is particularly the case that building land designation often constitutes (only) one part of an extensive, multi-stage planning or project process, both in terms of content and process. Typically, the project-related designation will not (any longer) be determined unilaterally by the public planning authority, but coordinated through cooperation between several actors (Kanonier & Schindelegger 2018, p. 114). In Austria, comparatively few official regulations explicitly address the balancing of land use-related benefits and drawbacks.

Whereas compensation mechanisms are above all common in the case of redesignation of building land into a greenfield site, until now planning gains resulting from building land designations or improved use options thanks to modifications in the development plan have hardly been addressed, apart from some agreements between municipalities and landowners within the framework of contract-based spatial planning.

4. OUTLOOK

The challenges in dealing with land are overall becoming more diverse and numerous. Increasing development pressure and the growing variety of uses also require more discussions in the scientific field in order to develop practical solution strategies. Planning practice shows that the tasks and positions of official spatial planning, in particular the land-use plan, have changed — just as procedures and criteria for designation specifications have. Legal requirements and actual application requirements in official stipulations only partially overlap. Against this background, the valid legal regime for land-use planning must be compared with planning practice requirements in order to deduce where regulatory or enforcement deficits lie. Higher education will above all need to deal with how to reduce the growing gap between strategic development considerations, on the one hand, and binding implementation measures, on the other, insofar as aspects of land availability and a fair balance of interests are taken into account as early as possible.

Over the next few years, the research unit will face the challenge of making a significant contribution to sustainable and, in particular, economical land use within the academic discourse. Measures and instruments must

1 In contrast, the new South Tyrolean State Law for Space and Landscape (LGBl. No. 9 of 18.7.2018, as laid down in Art. 24 para. 1) mainly views mixed areas as 'urbanistic use designations' — in addition to commercial areas.

be (further) developed to effectively conserve the 'land' resource against a still clearly excessive land take by construction-related uses. In this regard, delicate questions concerning inner-urban development, land 'mobilisation', and the limitation of construction activities will have to be answered. Critical questions will have to be asked about the diverse interests involved in future use proposals, while weighing mechanisms and weighting criteria will need to be worked out, which should lead to understandable decisions based on the common good in the practical weighing of interests. Essentially, the research unit will examine the tension between private property and the public interest more closely, and review the rights of disposal and use of land. In addition, we will have to address the special characteristics and requirements of various development forms, such as shopping centres and commercial areas, second homes, and affordable residential buildings, as well as climate change-related challenges to planning instruments and related processes and procedures.

Another priority of future research activities will be the distributional impact of land policy measures. So far, in Austria, the question of how the benefits and drawbacks are divided up and, most particularly, compensated by land policy regulations has hardly been addressed; hence, through international comparison, relevant mechanisms and solutions dealing with planning gains and restrictions will have to be pointed out.

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INTERDISCIPLINARY CENTRE FOR URBAN CULTURE AND PUBLIC SPACE

INTERDISCIPLINARY CENTRE FOR URBAN CULTURE AND PUBLIC SPACE RESEARCH UNIT

SKuOR RESEARCHERS' COLLECTIVE

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'At the provisional end of this state of emergency, one question remains: what will our social coexistence in cities and regions look like in future? In times shaken by crises such as these, the core objective of our research unit is to translate the demand for a changed reading of normalisation processes, which already pre-structured urban everyday life and places even before the crisis.'

SKuOR RESEARCHERS' COLLECTIVE

1. CURRENT CONTEXT — EVERYDAY LIFE UNDER COVID-19

At the time of writing, it is 2020 and this chapter for the Spatial Planning 2020 yearbook by the *Interdisciplinary Centre for Urban Culture and Public Space* has taken shape through remote work from home. In light of the current exceptional situation, brought about by the COVID-19 pandemic, and the resurgent interest for everyday life, we would like to address the importance of the everyday for space-related research, even before the present changes, from an urban studies perspective. In connection with this, we would like to describe the institutional path of the *Interdisciplinary Centre for Urban Culture and Public Space,* along with its evolving research and teaching work. In May 2020, in connection with COVID-19, TU Wien launched a call for participation in a 'digital salon' entitled *'What is in store for us?'* (TU Wien Vision 2025+ Online). The brief description in the introduction to the e-event began with the observation that the state of emergency had led to fundamental changes in our everyday lives and raised the following question: *in what ways is the COVID-19 pandemic changing our society, cities, and urban life?* (ibid.). The event text ended with some thoughts on the *'fit between public and private'* (ibid.), which should be re-examined within the context of the pandemic.

2. WHAT DO WE KNOW ABOUT THE INITIAL SITUATION — A SCIENTIFIC VACUUM?

The thrust of the argument is that everyday life (which is now being rediscovered in architectural and spatial planning debates) manifestly has suddenly changed owing to a barely visible virus. We can hardly keep track of these rapid current upheavals scientifically speaking and quickly reach the limits of what can be explained. In order to work in a sound scientific manner in the light of social upheavals and the associated changes in our professional practices — how we plan, design, and build space – we, as researchers and planners, cannot avoid concerning ourselves intensively with this 'initial state', that is to say, with the immediate, intermediate, and far-back periods before the change became noticeable. This suggests the following question: until now, have we, the various research units at the Institute of Spatial Planning, part of the Faculty of Architecture and Spatial Planning at TU Wien, insufficiently dealt with urban everyday life in scientific fashion? Does this situation now bring us into a kind of scientific vacuum because we are not able to comprehend the initial state — How was this everyday life actually, before COVID-19? — in depth and beyond simple common sense? What does everyday life actually have to do with urban life, our cities and society and, above all, with built space?

3. URBAN STUDIES — EUROPEAN EXCELLENCE IN UNDERSTANDING CITIES, EVERYDAY LIFE, AND CAPITALISM

Over the past fifty years, these considerations have increasingly become the central subject of an emerging scientific field, which thereafter will be referred to, and characterised as Urban Studies. According to the former Austrian Minister of Education, Science and Research, Heinz Faßmann, this scientific

field is to be dealt with across several disciplines (cf. *Wiener Zeitung* online 2018). In this field of urban studies, according to the Minister, European universities above all (but not only those) could build clusters of excellence as a counterweight to the elite universities of the English-speaking world (see ibid.). Increasingly, universities in various European and non-European countries are establishing new professorships, research units, and excellence programmes in urban studies (see Knierbein 2020). Thereby, they bring together experts from various professions and fields across borders and disciplines to consolidate a kind of *studium generale* through a precise thematic lens (urban development, urbanisation).

This field is also at the interface between basic research (e.g. in political theory) and applied research (e.g. innovation in municipal administration). This is because it enables researchers to establish connections between concrete changes in urban everyday life and broader scientific considerations, for example in social theory, political theory, and theory-building in the humanities. Everyday life, philosophy, and theory of science were never entirely of one mind; rather, multi-faceted areas of tension emerged between them, genuinely touching on areas at the intersection of art, culture, science, society, and democracy. A field such as Urban Studies | *Internationale Urbanistik* seems to be tailor-made for our Faculty of Architecture and Spatial Planning, gently bringing into scientific dialogue several disciplinary approaches and forms of knowledge. A second goal is to guide emerging dissent along productive paths, for a fair collegial conflict between divergent (professional) positions may be supportive of democracy.[1]

4. *INTERDISCIPLINARY CENTRE FOR URBAN CULTURE AND PUBLIC SPACE:* AN ETERNALLY TEMPORARY AREA?

Attentive readers might now wonder about the connection between the Urban Studies field of knowledge and an eternally temporary research unit that cryptically conceals itself either behind the acronym SKuOR or an English-language name: *Interdisciplinary Centre for Urban Culture and Public Space*. These practices of institutional naming are based on an adage used when a Visiting Professorship Programme for Urban Culture and Public Space was established at TU Wien in 2008.[2]

The decision regarding the name — one might ask, retrospectively, the masters of those decisive hours — is either based on prompting by the then founder, the City of Vienna, or resulted from a dialogue between the City Planning Directorate of the City of Vienna and the Dean's Office of the Faculty of Architecture and Spatial Planning at that time. The mission as stated by the founder was: to work on a newly emerging topic within spatial planning in a new manner and across disciplines in order to bring in new expertise on the soft aspects of urban planning in this field of studies and nudge them closer to the concerns of city dwellers living particularly in social housing.[3] A close link with urban design should be established in order to also improve the design quality of submissions to public appraisal procedures, design competitions, and implementation competitions concerning public parks and roads.

1 See, in particular, recent political theory contributions by Rancière (2010), Mouffe (1999, 2000) or also Marchart (2011). According to Mouffe (see Purcell 2009), it would be important not to let the dispute lead to extremes in terms of academic politics (antagonisms), but to conduct it amongst scientists with similar democratic values and basic attitudes (agonisms).

2 The acronym indicates nothing else than the web page of the research unit which, owing to TU Wien's own customs at the time, could not be created as a www yet as an http. The abbreviation means '*Stadtkultur und öffentlicher Raum*' — thereby indicating the current German translation of the research unit's name.

3 This is how the then city planning director, Kurt Puchinger, explained it to the public after visiting professor Dr Chiara Tornaghi had asked him about it, during a public evening event at the *Interdisciplinary Centre for Urban Culture and Public Space* at TU Wien.

5. ESTABLISHMENT OF NEW SCIENTIFIC MAIN TOPIC AT TU WIEN

Unfortunately, nothing came of it, because a different path was envisaged. If the establishment of a new scientific main topic was not considered a priority at that time, in the first three years of preparations for the then *'Arbeitsbereich'* (Interdisciplinary Centre), it already turned out that today's research unit would not view the imposed dictum only as a topic. Rather, the centre's research staff went so far as to regard urban culture and public space in first instance as analytical approaches to contemporary research on urban development from an urban studies perspective. In this view, urban culture and public space are regarded as lenses through which to investigate physical as well as social, cultural, and political changes in urban life and, in a second stage, to establish connections between these and changes in planning, architecture, and urban design. In a third stage, since 2016, the genuine connection between the two analytical entryways — public space and urban culture — has been worked out in greater theoretical depth.

Through a theoretical examination of the everyday with a focus on lived space, incessant changes in urban everyday life could be explored intersectionally against the background of a differentiated methodological repertoire and theoretical framework. Numerous publications from the years related to the Visiting Professorship Programme (Madanipour et al. 2014; Tornaghi & Knierbein 2015; Hou & Knierbein 2017; Knierbein & Viderman 2018; Gabauer et. al. 2022, Viderman et. al. 2023) provided about 80 empirical case studies shedding light on both methodological and theoretical suggestions through the analysis of urban everyday life in many cities and from the standpoints of various disciplines in relation to its context. This laid an empirical foundation for the more recent theoretical postulations.

6. SHIFT IN PERSPECTIVE: FROM RESEARCH ON CITIES TO URBAN STUDIES

In this context, research staff in the eternally temporary research unit also sharpened their arguments, conceptually speaking, with the shift from research on cities (*'Stadtforschung'*) to urban studies (*'Urbanistik'*) (cf. Lefebvre 2003 (1970)), through which the city is no longer primarily understood as a geographical or political and administrative unit. Rather, this traditional understanding should be contrasted with a working definition of a both local and global process of advancing urbanisation. For the purpose of analysing these urbanisation processes, the socio-economic, socio-cultural, socio-ecological, and socio-political aspects of changing everyday routines in cities come into play in addition to the spatial and physical changes to modes of settlement. In many approaches to urbanisation, those considerations that mostly come to the fore interpret urbanisation as a top-down political-economic process that gains international momentum through economic globalisation and leads to a morphologically observable urbanisation of cities, regions, and landscapes.

Such a research approach, anchored in the mainstream of urban studies, to which the primarily human geography work of Harvey (1985), Soja (1989, 1996), Brenner (2009) and Schmid (2005) can be assigned, has lately been underpinned by a more socially, politically, and culturally informed theoretical understanding of urbanisation; the latter breaks down global changes into changes to urban everyday life and does not regard urbanisation primarily as a politico-economic and socio-economic phenomenon, but rather brings socio-cultural, socio-political and socio-ecological aspects into the equation on an equal footing.

This approach neither views everyday life nor lived spaces as a micro space of lived experience, over which the meso spaces of institutions and policy formulation, as well as the macro level of economic globalisation, can be laid. Under this approach, urban everyday life is more likely to be understood as a para or meta level at which changes on all these scale axes come together and become socially as well as structurally and spatially apparent. In urban everyday life, whose continuous transformation manifests itself visibly, especially in public space (and, less observable, in private space), global urbanisation trends are also spatio-materially sedimenting. Thus, economic globalisation and, also, institutional transformation reveal themselves in concrete terms in new design-related governance coalitions that shape, for instance, new microarchitectures in public space (e.g. bus stops, public toilet facilities) (cf. Knierbein 2010). Urbanisation is understood here, above all, in socio-historical terms, as a transgressive unfolding of late capitalism, that is to say, as a societal process in which capitalist social relations constantly materialize. In this process, an intersectional approach, on the one hand, shines a light on constant interactions between socio-economic, socio-political, socio-cultural, and socio-environmental aspects. On the other hand, the intersectional research approaches originating in the feminist humanities and social sciences are also based on an analytical interest in the issue of how various discrimination strands (e.g. education, gender, ethnicity, class, religion, etc.) interfere with and overlap one another (cf. Bargetz 2016). Thus, the research interest that can fundamentally be ascribed to the aforementioned Urban Studies | *Internationale Urbanistik* approach illuminates the constantly changing relationship between majority and minority society in spatial terms against the background of considerations related to democracy theory.

Changes in the late-capitalist production of space can thus be read off everyday life and lived space. This, in turn, provides insights into the interfaces between the social sciences and humanities, on the one hand, and the spatial arts on the other (architecture, planning, urban design, landscape architecture, landscape planning, and the visual arts). As is already evident, such a research perspective is dedicated to taking (amongst other issues, capitalist) processes of urbanisation and urban everyday life as its central objects of investigation; it enquires about the connection between the physical and social, cultural, political, environmental, and economic arrangements of everyday life (such as public spaces, social infrastructures, etc.). This involves various dimensions: empirical research and methodological reflection and exploration, as well as theory building. From the outset, researchers at the centre also considered it a central point to address new ways of learning in the open, democratic knowledge society in order to set new pedagogical and didactic impulses within the European university landscape through the two main topics: public space and urban culture. Since 2010, this has primarily been driven by the establishment of the *Thematic Group for Public Spaces and Urban Cultures at the Association for European Schools of Planning* (AESOP-TG PSUC) (cf. Knierbein & Sezer 2015), thanks to which knowledge already gained could be incorporated into the existing curricula of various study programmes throughout Europe.

7. CHANGES IN EVERYDAY LIFE, TRANSFORMATIONS OF LIVED SPACE

Thanks to its genuinely socio-historical focus on the transformation of everyday places and everyday life, the Urban Studies | *Internationale Urbanistik* field is able to grasp complex socio-spatial relations in tangible terms. In this regard, urbanists seldom endeavour to develop ad-hoc spatial development solutions, since the causes of certain spatial problems are often ambiguous and structurally located at other levels or in other disciplines (e.g. social work, environmental and landscape protection, etc.). Rather, we are more concerned with revisiting urban problem constellations in architecture and planning through a spatial analysis extended to include contents from the social sciences and humanities.

Researchers at the *Interdisciplinary Centre for Urban Culture and Public Space* therefore try to embrace and, as far as possible, explain, the full array of urban ambiguities — situated within varied views and modes of action regarding progress and modernisation, emancipation and democracy.

Even though, in recent years, the centre has developed theoretical foundations for the establishment of a everyday-theory-based urban studies approach by intersecting the most diverse strands of theory that deal with urbanisation and everyday life, this fundamental approach does not make any holistic claims.

Quite on the contrary: because the urban phenomenon is too complex and changing incessantly, that is to say, is subject to continuous socio-spatial transformation, it can never be fully explained. Neither through the perspectives of individual disciplines, nor with the help of interdisciplinary scientific cooperation. Hence the research and teaching efforts of the research unit explicitly follow a non-holistic urban studies approach, which scientifically explores the ambiguities of urban everyday life in lived space. We can get as close to the urban phenomenon as possible, for example through empirical fine-tuning and thick description, yet can never completely grasp it: research into changing everyday life in cities is thus an area in which new research topics always open up while old strands have to be reconsidered and their social relevance checked. Everyday life also harbours emancipatory power, which can be expressed through social movements, protests, and forms of co-production involving civil society which, like any other phenomenon, however, must be investigated with the necessary analytical distance.

8. STRATEGIC MAIN TOPICS IN THEORY OF THE EVERYDAY IN URBAN STUDIES

The *Interdisciplinary Centre for Urban Culture and Public Space* pursues a strategic deepening of urban studies efforts at the intersection of urban research, urban design, and urban planning — with a special emphasis on urban culture and public space. Furthermore, its research staff act on the premise of a critical analysis of capitalist urban development in the 20th and 21st centuries. The entryway into our studies is cities' lived space, where everyday life unfolds in a diverse yet ambiguous manner. Our theoretical research activities on the everyday deal with five areas of scientific work (fields of research) and the interactions between these fields, as detailed below.

(1) Urban society

The urban society field of research points at the positionality of planners in construction, planning, and participation processes; it deals with spatial disadvantages, peripheries, and the spatial needs and demands of marginalised urban groups (e.g. groups with fewer opportunities to access housing, education, and qualified work) as intensively as with those of mainstream society (e.g. urban middle classes, educational climbers, etc.).

In addition to planned, built, and designed settlement structures and their manifold effects on social agency, the spatially constitutive characteristics of social agency are also brought to the fore: here, spatial appropriation processes and the work of self-organised collectives (e.g. NGOs, civil society actors, associations, etc.), as well as sociological and socio-spatial perspectives on public space design processes, play a role. Recently, researchers have also started looking at the connection between housing and open space research. At this analytical level, the connection between the individual (micro level) and institutions in various fields of relevance (work, family, politics, education, leisure, culture, housing, etc.), and the connection between the state, markets, and civil society (e.g. through trade unions, NGOs, churches, or associations), are anchored in the spatial analysis. At this level of analysis, the socio-political and professional-political self-understanding of urban planning and its historical transformation during globalisation are also discussed. An urban studies field of research that is based on planning sociology enables a differentiated view of the multifaceted needs, lifestyles, and everyday practices of very different social groups in the city. In a broader sense, it therefore conveys basic planning ethics-related considerations on possible approaches to negotiated urban development and planning that deal with the city as a collective social actor.

Approaches in the sociology of innovation and in organisational sociology are engaged to accelerate research into social innovation, especially with regard to municipalities as innovative actors. It is the task of the urban society field of research to bring into dialogue everyday-based, action-oriented and practice-focused theoretical conceptions of space with relevant approaches to spatial planning and urban design as a methodically structured field of action of spatial development in the city, characterised and informed by differently constructed values.

Demographic traits and features of settlement patterns play a role in the examination of the city along planning sociology lines, as do the mobility and environmental behaviour topics.

However, ever-present, profound ambiguities underlie the social production of space. These are expressed, for example, in the shape of (in) formal injustices, which may be architecturally reflected in spatial structures of division, segregation, and fragmentation. Socio-economic structural features are also a central entryway into the urban society field of research, within which topics such as social inequality, urban poverty, youth unemployment, informalisation, and precarisation are discussed intersectionally at the *Interdisciplinary Centre for Urban Culture and Public Space*.

(2) Urban economy

Historically speaking, urban development and urban planning have always had a strong economic relevance in the areas of land policy, land management, locational policy, and the negotiation of property and ground rents within the welfare economy. No later than the beginning of the phase of post-industrial urban restructuring, theories about the relationship between the use value and exchange value of space were expanded to include the new roles played by symbolic economies (cultural, media, and attention economy) in urban development (cf. Zukin 1995; Knierbein 2010). Some of these considerations concern, the basic provision of urban services of general interest to local residents, or changes in urban ownership patterns. They are also about the activities of markets and market players in urban space and the role of urban design and urban planning in view of the most diverse partnerships and coalitions. In the course of urban restructuring, an increasing number of spatially relevant coalitions between markets, the state, and civil society (e.g. in the form of public-private partnerships, construction or service concessions, business improvement districts, urban development contracts, etc.) are being forged under the heading of *New Governance Arrangements*.

In addition, in the past decade, municipal administrations have experienced a transition towards the entrepreneurial city which, not unjustly, has been the subject of strong criticism within scientific and socio-political discussions. Whereas a macro-economic view of the urban economy continues to take priority as regards the provision of public infrastructures and supply/disposal monopolies (water, gas, electricity, waste, etc.), business management rationalities (e.g. project life cycles, expectations of short-term returns, controlling, etc.) are increasingly also gaining ground within the public sector.

As a result, economic perspectives have a decisive influence on urban development and planning: they enable us to perceive prevailing innovations and new labour markets in the city, thus, they help researchers understand how urban economies are restructured roughly speaking from an industrial to a service and knowledge economy. At the same time, however, they also point to the economic crises that go hand in hand with the emergence of a global economic model and have repeatedly led to spatial decline or disintegration and to precarious urban living conditions.

It is the task of this field of research to shed more light on the dilemma of an unstable, crisis-prone and, at the same time, innovative capitalist urban development, and to explain it with concrete examples. Thus, with the help of regulation theory approaches, a differentiated, constructive yet critical assessment of the various contributions of business management and marketing studies to planning theory may be conducted. Researchers also come into contact with market players as long as the preconditions for dialogue are met: we consider *open innovation* to be essential, but only if it is radically open during all phases of the innovation cycle. For this reason, we do consider and discuss conceptions of open, cultural, public, and civic innovation while always (critically) bearing in mind that innovation must be understood as creative destruction (cf. Schumpeter 1964). For we are concerned about the social costs of disruptive innovations and analyse from an appropriate distance how (dys)functional routines may be shaken up by innovative impulses (*unsettling*) (Viderman et. al 2023). The key questions in relation to these considerations are: Whom do specific innovations serve? Who is unable to benefit — either individually or collectively — from progress, modernisation, and innovation? When it comes to the social component of economic progress, can spatial planners design or plan spaces for emancipation and innovation at all? Or must planners and the planning profession first make an effort of self-reflection and emancipate and 'innovate' themselves (or let themselves be emancipated and 'innovated'), before presuming to set emancipatory impulses for others?

(3) Urban Ecology

The sustainable use of natural resources is expressly a precondition in places where many people live in a tight space. Cities are therefore ecologically dense and climatically polluted ecosystems that constantly create new niches and opportunities for the conservation of scarce resources (flora, fauna, and the social world). In this field of research, urban-rural dynamics and attempts to overcome urban-rural antagonisms are discussed in the light of the urbanisation debate; moreover, we pay closer attention to ‘other’ urban residents (plants, animals, viruses, nanoparticles, etc.). Aspects such as land reclamation, interim use, and conversion of urban brownfields, open spaces, and ground floors play a key role here, as do innovative ideas concerning urban energy and resource production (e.g. fish farming on urban buildings).

Aspects such as the climate crisis, the urban climate, and transport policy and climate protection, as well as the transformation of (national, regional, and local) energy policy and its effects on urban ecology and urban environmental policy, belong to yet another level of spatial planning decisions. Ecological perspectives are indispensable to the tension field of urban planning. For this reason, this field of research aims at developing in-depth spatial knowledge regarding pressing environmental issues related to the climate crisis, climate protection, resource conservation, and energy transition. In particular, with regard to public space, social movements and forms of protest against the climate crisis (*Fridays for Future,* bicycle path decisions, amongst others) are therefore relevant. The professional policy handling of urban overheating and setting up of cooling streets (especially near schools and childcare facilities), and an increasingly ageing society, are becoming increasingly relevant.

In addition, links to landscape ecology, open space planning, and the landscape architecture have been established. Since the onset of the COVID-19 pandemic, if not earlier, with its restrictive effects on everyday life and social coexistence in cities and settlement areas worldwide, researchers in the urban ecology field of knowledge have had to address more intensively those barely visible or invisible actants (viruses and nanoparticles) whose unfolding effects, both on the design of built environment and on social coexistence, have so far hardly been assessable. How can social coexistence be promoted despite physical distancing, for example in the case of seating mobiliary in public space? How do spatial planners react to increasing trends towards individualisation and the emergence of and retreat to enclaves in urban society?

(4) Urban politics

By looking at the relationship between architecture, urban design, urban planning, and urban politics, it is possible, firstly, within the framework of urban policy analysis, to explain the contents, objectives, and methods of urban politics as an actual political field of action that is divided into various subfields: locational competition, urban development policy, planning policy, and open space and environmental policy (in a narrow sense), as well as other relevant fields of urban policy (e.g. social and labour market policy, education and cultural policy, health policy, and integration policy).

Secondly, this result-oriented *urban policy analysis* can then be extended to include the structural framework conditions of politics (*urban polity analysis*) such as the political organisational structure of districts, city state, regions, and the nation state. In this understanding, planning and urban design, for instance, may be viewed as institutions that are equipped with (sovereign) tasks, responsibilities, and resources within the framework of the democratic constitutional state, and perform alongside a defined 'public interest'. Looking at the history of planning and urban design, it becomes clear that institutions are shaped very differently by specific actors, protagonists, and personalities with specialized modes of action, perceptions, and attitudes with which the approach of actor centred institutionalism (cf. Scharpf & Treib 2000) is engaged, among others.

Thirdly, urban policy analysis and the institutional investigation of the structural arrangements and design dimensions of urban polity analysis are supplemented by the input-oriented investigation of: the politics of urban development (for example, in ongoing projects); the involved actors, resources and interests; and the mode of political decision-making (e.g. conflict management, consensus building, and dealing with dissent) (urban politics analysis). Imparting knowledge about political cultures and political milieus also plays a central role here.

In order to conduct a differentiated investigation of policy, polity, and politics in their urban policy interactions, the governance approach may be called upon as a political science analytical tool for urban research. In this

regard, however, we must take on board the criticism that governance is scientifically considered as an affirmative rhetoric of neoliberal and entrepreneurial urban development policy and, accordingly, explore its theoretical soundness.

In a broader sense, the field of urban politics deals with two perspectives on political action in the city: institutionalised politics (e.g. parties, government, administration, policy programmes) and 'the political' in the city (e.g. political action in public space, protests, social movements, everyday spatial practices). It is only in the interplay between these two perspectives — where an understanding of the right to the city relating to direct urban democracy meets with representative forms of democracy— that emancipatory practices arise for various residents in the city (both for citizens with voting rights and city dwellers without voting rights such as children, migrants, etc.). It is this interplay which supports the emergence of potentially critical (counter)publics, and, thus, the control of state action by many. However, this does not happen automatically and, sometimes, conflicts in public space will show that the public urban realm serves as a seismograph of the social peace in the city and region. Thus, the urban political field of research not only fulfils the task of presenting the inner workings of planning processes in an understandable manner, but it also seeks to explain the basic democratic workings of planning, as well as their transformation.

9. POSITIONS AT THE INTERFACE BETWEEN SCIENCE, CIVIL SOCIETY, AND POLITICS

Within and between these fields of research (*analysis*) and fields of action (*policy*), the *Interdisciplinary Centre for Urban Culture and Public Space* provides a wide range of transdisciplinary transfers between society and universities, between politics and science. This enables constant communication to be maintained between civil society, technique-oriented disciplines, and public institutions. The centre's staff intensively deal both with the visible and invisible changes of everyday life. In each case, the empirical approach is underpinned by theories of space and planning theory; it is embedded, both in terms of method and methodology, in the respective socio-spatial context. In past years, scientific emphasis was placed on the intersection between the urban society, urban culture, and urban politics areas of analysis, whereas our current research increasingly addresses the fields of urban economy, geopolitics and also, urban ecology. This is partly due to scientific conjunctures in public space debates now more strongly emphasizing austerity, climate crisis and, last but not least, the debate surrounding 'Fluchtraum Österreich' ('Space for refugees in Austria'), resulting in a shift in scientific emphasis. However our research foci are determined in equal measure by the existing body of knowledge and expertise of the scientific staff and their specific contributions to urban studies according to their respective disciplinary background.

As a fundamental premise of our many years of research into public space, we would like to take account of the complexity of the subject: after all, public space is not only one of the fields of many academic perspectives but, rather, a social sphere in which both everyday needs and contradictions

and the political assertion of interests and political protest of dwellers, all of which could not be more different, manifest themselves. The empirical exploration of public space uncovers a field of tension between increasing social individualisation, fragmentation, and isolation of social groups whilst simultaneously new forms of collective urban life and collectivised political contestations unfold. Planners, who often stand at the crossroads of interests — of residents, civil society, political parties, and the state — are often assigned a key role in converting these contestations and conflicts into productive negotiations about ways to democratically design a city. Through an urbanistic examination of public space, new models of ideal types of urbanisation and ideas for the 'good city' can be developed. Time after time, these new ideas about the ideal city of the present and about democratic paths towards urbanisation make it clear to planners that we have not yet achieved the objective — to democratically shape spatial processes — and that we are constantly encountering new questions and dilemmas on the way to fulfilling normative planning goals. Exploring lived space is therefore not only a personal lifelong learning process, but also an institutional one. Thanks to this process and the active, permanent debate with the most diverse groups and segments of urbanised societies, knowledge can be transferred from the university to urban society and knowledge from the latter can be conveyed back to the university.

The exploration of spatial practice in concrete spaces of everyday use interacts with those theoretical debates during which empirical findings are connected to the intellectual traditions of social, cultural, and political theories of the city and urbanisation. Here, for example, epistemological links between feminist theory of the everyday, critical social theory, and the field of the philosophy of praxis may emerge. Furthermore, our research also includes traditional urban studies *topoi*, such as urban resistance, emancipation, privatisation, and commercialisation. These social theory efforts serve to bring to the fore particular everyday cultures and path dependencies in relation to specific urbanisation histories and to embed the spatial aspects of urbanisation in the broader investigation of social change. Yet here too, the sphere of influence of the urban studies scientific field is subject to clear boundaries, which are worked out through an in-depth examination of social, cultural, and political critiques of the shortcomings of the commodification of public space and capitalist colonisation of everyday life (cf. Lefebvre 2014).

Epistemologically, lived space provides for the central interface to engage with a spatial analysis of social change and its ambiguities. Our understanding of lived space is relational (cf. Tornaghi & Knierbein 2015), that is to say, public spaces are characterised by social relations and their spatial and material manifestations. Power, likewise viewed from a relational perspective, is omnipresent in these social relations and hence in lived space and its built arrangements as well. Similarly, the potential for change is always inherent in lived spaces — as built places where urban everyday life can potentially unfold. It is the planners' responsibility to stimulate social change positively and indirectly in many different directions through stimulating and inclusive spatial interventions, while clearly distancing themselves from both spatial and

social determinisms (*nudging*, *social engineering*, and *social design*). We therefore locate inclusive planning interventions both at the social level of planning process design and at the material level of the (legal, political, democratic) configuration of land policy, zoning routines, and construction methods.

The debate with urban societies takes place initially at the office, in the seminar room or in the lecture hall. At a second stage, it finally makes its way to the street, the square, into the park and the café, or to the new building plot, where future ways of living and everyday opportunities and their uses have not yet been discussed at all. Conversely, it is in the lived urban spaces, in particular those with public access — the station concourses and trains, ground-floor zones, tramways and social infrastructures, underground stations, and underground trains — that we can develop novel planning and design approaches in conversation with urban (counter-)publics by making contact with various users of the city, diversifying and pluralising the voices that participate in urban development decisions. To sum up, by sensitively combining several schools of thought, we analyse social change by focusing on global urbanisation processes through the lens of a context-specific examination of ever-changing, ambiguous urban everyday life routines, temporalities and contestations.

10. THEORETICAL APPROACH TO THE EVERYDAY IN URBAN STUDIES

Given the changing role of academics in this endeavour, it is also important to delve deeper into everyday life and everyday experiences in terms of the philosophy and politics of science. This goes hand in hand with the demand that theories of everyday life be intensively incorporated into research and teaching at the TU Wien (Knierbein 2020, referring to Bargetz 2016). The field of knowledge through which we wish to establish this important dialogue is precisely that of urban studies, within which new findings from the spatial, social-science, and technical disciplines often meet and sometimes collide, thereby producing new forms of scientific knowledge at the interface of the spatial arts, and the social sciences and humanities. However, in order to cultivate a context-sensitive and complexity-based approach to urban studies, the object of research — the urban phenomenon of interest — must be strictly circumscribed. This makes it possible to make full use of the depths of the relevant disciplinary fields of research and to uncover the breadth of those niches that open up between established fields of research. While researchers at the *Interdisciplinary Centre for Urban Culture and Public Space* work on these gaps empirically, methodically, and conceptually, they also identify and inspect the aporias, shortcomings, and boundaries of all too narrow or all too wide conceptions of cities, urbanisation, and urban life.

In the course of the past decade, staff of the *Interdisciplinary Centre for Urban Culture and Public Space* have published a number of books and organised, or held, more than 100 lectures (see *Interdisciplinary Centre for Urban Culture and Public Space* Online 2019). We have created an open learning environment that includes students, their skills, and their expertise, regardless of their origins or backgrounds: in our view, all students are international researchers. Many groups, associations, and organisations have shown interest in jointly testing

new transdisciplinary learning arrangements with us. In particular, Summer Schools have proven to be a fruitful environment for this exchange of ideas, which has significantly influenced our transdisciplinary connection to theory. External teaching staff have reminded us, thanks to their local and methodological knowledge, that the university must always stand firm in the seminar room or lecture hall, while it equally must position itself alongside those experts who develop and explore spaces of urban life out of their spatial and planning practice. In particular, this refers to connections to those institutions and associations that practice inclusive and egalitarian access (for example, benefitting certain marginalised groups) to everyday spaces in the city and region.

In our scientific context, being 'smart' primarily means promoting a new reflexive humanism, in contrast to a doctrine of avatar-like puppets whose behaviour must be optimised on the basis of rational, economic, or algorithmic calculations. This contemporary humanism, which we help shape actively, addresses the contemporary critique of anthropocentric science and behaviourist determinisms, such as are often found in environmental psychology research on public space design. We consider this humanism to be necessary in order to interlink studies on the transformation of urban forms with research into the ever-changing course of urban everyday life. In this way, we combine research approaches that focus on social encounters between research subjects in order to conceptualise research objects along new paths.

11. CURRENT CHALLENGES TO SPATIAL PLANNING

Against this background, a number of questions need to be asked: how can new technology take into account a new ethics of care that is concerned with basic human needs, most especially for those segments of society that are particularly needy or vulnerable? Who benefits from technological innovations in urban development, and who does not? Can we emphasise spatial planning features even more strongly when it comes to including those who have been left behind? Besides, since we are talking about vulnerability: who is viewed as vulnerable — according to international standards — and does this also include all those who themselves believe that their socio-economic living conditions are to be regarded as vulnerable? How might spatial planners reassess the social relevance and impact of their work? Have academics in spatial planning and research already found ways to interact with society, even beyond unilateral participation processes? How might we, spatially speaking, manage to counter growing social inequality in cities around the world with our resources, in conjunction with other professions? And how can we assess the impact of spatial planning and urban design on the increase in property values, for example through land policy and zoning? In what ways do theoretical considerations on the everyday not only flow into the soft aspects of planning (through an intersectional approach) but also into the hard core of its main business, such as zoning practice? When it comes to the negotiation of concrete details of everyday life, in school, on the street, at home, and at the office, questions must always be asked with a view to specific historical contexts and structural (socio-political, economic-material, and cultural) embedding. We ensure that these can be processed in a series of precisely, differentiated research phases.

Hence we would like to see more discussion forums, new teaching and learning arrangements, and innovative research projects in all areas of our institute, our faculty and, also, the TU Wien, our university; these would deal steadily, and with a critical eye, with our factual/pre-existing everyday life routines. Only then will we be able to achieve the necessary depth to better understand and work out the states of emergency of this everyday life and their urban path dependencies and context-specific features. One question we might like to ask would then be:

- *'So what is in store for us?'* This should always be followed by at least two other questions:
- How (rapidly) had urban everyday life already changed (spatially speaking) before the onset of a state of crisis, for whom, and why? and,
- What roles, resources and responsibilities have planners, urban developers, and architects assumed during these processes, and to what extent were their conceptions previously related to the ambivalent transformation of everyday life?

We are writing in the year 2020 (almost June) and revising this contribution on a COVID-19 sick leave, prevented from travelling but not under quarantine. At the provisional end of this state of emergency one question remains: What will our social coexistence in cities and regions look like in future? In times shaken up by crises such as these, the core objective of our research unit is to translate the demand for a changed reading of normalisation processes, which already pre-structured urban everyday life even before the crisis. For even before the crisis, we could have fathomed the transformation of urban everyday life in spatial terms merely by questioning routines that were regarded as normal, as well as their genealogy. Spatial planners have become aware of the need for such a shift in content at today's point in time as fifty years of spatial planning history have been completed. A point when little seems to be the way it used to be. Whereas built space still seems to radiate steadiness, in everyday life, no single stone has been left standing.

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URBAN DESIGN AND SPATIAL PLANNING
Interfaces, challenges and potentialities

URBAN DESIGN RESEARCH UNIT

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Current considerations on the relationship between urban design and spatial planning allow us to identify a number of similarities. Emphasis lies on those issues that we discuss in our teaching and research practice: what challenges will influence the future development of our society and what spatial preconditions must be created for these? Today as in the future, how can we change and shape habitats within resilient, climate-compatible and inclusive parameters? Which strategies and concepts might lead to a development in which social justice is not just an empty buzzword?

These core questions and numerous related layers of discussion dare us to take a position and offer solutions. In this regard, we can already state that the interpenetration and overlapping of spatial and functional relationships — between micro and macro levels, between urban and rural contexts, and between bottom-up and top-down approaches — and the conceptual overcoming of various patterns of thinking, traditions, and scale levels are amongst the basic prerequisites for answering these questions.

Actively seizing and transcending interfaces, and the associated transdisciplinary dialogue, are part of everyday life in urban design teaching and research, as well as topics such as: housing and open space; transport and socio-economics; building typology and technology; the protection of listed groups and the handling of industrial heritage; and artistic and cultural processes as well, to name just a few. In academic practice, the intensity of the interpenetration between disciplines and fields of work is not only influenced by the above-mentioned technical challenges, but also by the current organisational chart of the Faculty of Architecture and Planning, and the associated spatial situation between fields of study.

A look at history as well as an analysis of status-quo activities reflect these varying intensities of interpenetration between urban design and spatial planning, suggesting common, future areas of responsibility that require a high concentration of staff.

‘From regional planning to local spatial planning, issues are closely connected to urban design. Where a city ends and a region begins can no longer be determined; indeed, one is not conceivable without the other, anyway.’

A. HOFER & M. TOMASELLI

1. URBAN DESIGN AND SPATIAL PLANNING: HISTORICAL INTERDEPENDENCIES

Karl Mayreder (1856–1935) is regarded as the founder of urban design at the Vienna Technical University, and the academic year 1900/01 is repeatedly mentioned as foundation date (Wurzer 1965; idem 1984). The then chief architect of the City Regulation Office of the Imperial Capital and Residence of Vienna called his lecture ‘Open lectures on urban design’ and paid tribute to Camillo Sitte through the subtitle: ‘[…] *paying special attention to his* [Camillo Sitte] *artistic principles* […]’ (Wurzer 1985, p. 57). Interestingly, Karl Mayreder held a professorship for ‘Propaedeutics of Architecture, Architectural Drawing and Picturesque Perspective’; the lectures that he gave on urban design at that time were a teaching assignment. Not until 1932 would urban design be embedded within the Technical University through the establishment of a tenured professorship. Before that, however, after the

end of the First World War, two students of Charles Mayreder, Karl Holey and Karl Heinrich Brunner, would further develop the academic discipline of Urban Design.

The architect Karl Holey (1879–1955), known for the construction of numerous sacred buildings in East Austria, was appointed in 1920 as a private lecturer on the History of Urban Design, which he lectured on, with some interruptions, until his retirement in the early 1950s.

In 1925, Karl Brunner (1887–1960) qualified as a professor thanks to his book: *Baupolitik als Wissenschaft* [Engl.: *The Science of Building Policy*]; the following year, he was appointed as a private lecturer on Urban Design and Settlement Types. Brunner created an 'Open lecture course on building policy and urban design', which included lectures and exercises for advanced students. Rudolf Wurzer called the establishment of Brunner's seminar *'the beginning of real planner training in Austria'* (Wurzer 1969, p. 3). Karl Brunner taught at the Technical University until 1929 before travelling around Chile, Colombia, and Panama for about 20 years. While he was there, he headed several urban planning offices and taught urban design at various universities before being appointed as Vienna's urban planner in 1948 (Hofer 2010). Until the end of his career, this trained architect was actively engaged at the interface with spatial planning; shortly before his death in 1960, he completed a book manuscript, *Raumplanung* which, sadly, was not published.

Erwin Ilz (1891–1954), who had also been an assistant to Karl Mayreder, was appointed a senior lecturer in Housing, Urban Design and Settlement Types in 1932. This was accompanied by the creation of a so-called extraordinary tenured professorship of the same name (Wurzer 1966, p. 6). It was not until the creation of a permanent post for a Professor of Urban Design and Settlement Types in 1939 that Urban Design became a discipline on an equal footing with other disciplines in architectural education.[1] After the end of the war in 1945, Erwin Ilz was sent into retirement and his former assistant, Karl Kupsky (1908–1984), took over teaching on Urban Design and Settlement Types (Az W 2006). In 1954, attempts to rehabilitate Erwin Ilz led to a short-lived change of the designation to 'Chair of Urban Design, Regional Planning and Spatial Planning' (Wurzer 1985, p. 69). This position was then occupied from 1956 by Johannes Ludwig (1904–1996) but only for a short time: in 1957, he answered a call to work in Munich.

In 1959, Rudolf Wurzer (1920–2004) was appointed a Professor of Urban Design, Regional Planning and Spatial Planning at the chair of the same name, which he renamed 'Institute of Urban Design, Spatial Planning and Land Use' in 1962 and headed until his retirement in 1990. Rudolf Wurzer's role at the interface between urban design and spatial planning included multi-faceted activities.

In addition to being well-known for founding the spatial planning field of study at the Technical

1 Nevertheless, in wartime, as a chair holder Ilz played a rather inglorious role, including in Viennese planning history, with conceptions shaped by Nazi style (he had been a member of the NSDAP since 1932). Some of his proposals for loosening up and separating functions may well already have anticipated post-war planning but, at the same time, he joined the choir of those who wanted to bulldoze the Viennese Leopoldstadt to the benefit of monumental planning schemes; he even spoke of the necessary relocation of 500,000 people to undefined satellite cities along new transport links to be created in the area surrounding Vienna (Mattl & Pirhofer 2015).

University in 1970, he also provided a significant impetus through his work as a city councillor in Vienna's urban planning administrative department from 1976 to 1983.

In 1975, the Technical University was renamed TU Wien. Under the new faculty structure that came along with this, the Faculty of Civil Engineering and Architecture became the Faculty of Spatial Planning and Architecture. Here, too, we can see the changed value attached to subject areas in the university's organisational chart and their designations.

In 1990, Klaus Semsroth took over the management of the Institute for Urban Design and Spatial Planning until Kunibert Wachten's appointment in 1994. Wachten was appointed as the Institute's Director on 1 June 1994 and kept this position for five years. In 1999, after Kunibert Wachten, who was also Dean of the Faculty of Spatial Planning and Architecture, accepted a chair at RWTH Aachen, Klaus Semsroth took over the function of Dean and Erich Raith that of Institute Director. That period also witnessed a failed procedure for the appointment of a successor to the chair of Kunibert Wachten; this subsequently led to the loss of one of the two permanent professorships at the Institute.

'Spatial planning', which had been part of the name since the end of the 1950s, has gradually 'disappeared' since 1996. We have not yet been able to find a definitive decision in this regard; in any case, the last documented use was recorded when courses for the 1998/99 academic year were announced. In 2004, a change in the faculty structure once again led to a change in the Institute's organisational chart. The Spatial Planning department was separated from the Institute, while the Landscape Planning and Garden History department was added.

The newly created Institute of Urban Design and Landscape Architecture was headed by Richard Stiles as Institute Director from October 2004; Erich Raith was in charge of the Urban Design department until Christoph Luchsinger's appointment as a Professor of Urban Design in autumn 2009. In December 2009, Christoph Luchsinger was appointed as Director of the Institute which, since 2007, has also included the Real Estate Development and Project Management department, and headed it until 2012. In the following years, again the Institute's directorship changed several times, with Markus Tomaselli (2013 to 2016), Richard Stiles (2016 to 2018) and, again, Markus Tomaselli (from 2018 until today).

Let us summarise again the various names of the current Institute for Urban Design and Landscape Architecture since the founding of the first tenured professorship in 1932. This fluctuation of names and terms provides an insight into self-conceptions regarding interactions between urban design and spatial planning over all the decades of their joint development and up to the above-mentioned separation in 2004/05:

- Extraordinary tenured professorship for Housing, Urban Development and Settlement Types (1932–1939)
- Tenured professorship for Urban Development and Settlement Types (1939–1954)
- Chair of Urban Design, Regional Planning and Spatial Planning (1954–1959)

- Chair of Urban Design, Regional Planning and Spatial Planning (1959–1962)
- Institute of Urban Design, Spatial Planning and Land Use (1962–1999)
- Institute of Urban Design and Spatial Planning (1999–2004)
- Institute of Urban Design and Landscape Architecture; this consists of two departments: Urban Design, and Town and Country Planning and Landscape Gardening (2005–2006)
- Institute of Urban Design and Landscape Architecture; consists of the Urban Design, Town and Country Planning and Landscape Gardening, and Real Estate Development and Project Management departments (since 2007).

In many respects, a multitude of connections have endured between urban design and spatial planning beyond the designations of the research units and institutes. Joint courses are offered in both the Master's and Bachelor's degree programmes, even though the lack of coordination of the two fields of study's syllabuses complicates this. The next section will provide an overview of priorities within the interface between urban design and spatial planning in teaching practice.

2. URBAN DESIGN AND SPATIAL PLANNING: TEACHING PRACTICE AND JOINT PROJECTS

The Urban Design research unit and several research units from the Spatial Planning field of study cooperate on numerous courses, some of which we shall now mention.

Through the Projects 1 exercise, spatial planning students, supervised by Michael Surböck, have been developing urban design for about twenty years. Bohdan Tscherkes, Univ. Lecturer at the Urban Design research unit, lectures on Urban Models and Urban Utopias during the first semester of the Bachelor's programme in Spatial Planning. Cross-curricular collaboration is already everyday practice in the Master's programme as well. In the International Urban and Regional Development and Development Management modules (coordinated by Rudolf Giffinger and Andreas Hofer, respectively), alternatingly delivered lecture series are important components of teaching. Within the associated training building blocks, they also lead to concrete joint projects by students in the architecture and spatial planning fields of study. Furthermore, much collaboration takes place within the practical projects themselves (drafting and P3, joint excursions, joint master's dissertations), during which interfaces between urban design and spatial planning are actively discussed or research units from the two fields of study do tangible work together. Here is a selection of current examples:

- Design / P3 2020: '50 years of Puchenau, what now?' (Urban Design research unit, Regional Planning research unit)
- In the middle of the city: New spaces / New urban development strategies for digital pioneers in the small town of Zeulenroda-Triebes, Thuringia (Master's dissertations 2020, Urban Design and Regional Planning research units)
- Transformation Processes in Metropolitan Development: A study visit to Colombia 2016 (Urban Design and Regional Planning research units)

- Nassau Urban Lab 2015/16 (Urban Design, Housing, and Land policy and Land Management research units).

This list is by no means exhaustive and does not belie the fact that collaborations could definitely be strengthened further. Until recently, the Urban Design Library was a very specific source of inspiration as regards commonalities and the expression of practical collaboration between urban design and spatial planning. The history of the Urban Design Library is closely linked to the historical development of the Urban Design research unit, and that of the Institute, as outlined in Section 1.

The collection was started back in 1900. As a result of the above-mentioned teaching activities of Karl Brunner and, later, of Erwin Ilz, the special library continuously expanded despite the precarious financial situation faced by universities in the interwar period and during the war. Already at that time, the library's acquisition policy not only included purely urban design topics, but also emphasised a holistic architectural and planning education. Following the appointment of Rudolf Wurzer as a Professor of Urban Design, Regional Planning and Spatial Planning, the year 1959 signified a significant boost for the development of the Urban Design Library. During his tenure as the Director of the Institute (until 1990), Wurzer built up the Urban Design Library — around 30,000 volumes — into one of the most extensive specialist libraries in German-speaking countries in the fields of urban design, urban planning, and spatial planning. Continuous technical support for the Urban Design Library has been an essential part of this development and continued until recently, even after Rudolf Wurzer retired in 1990. The library became an important reference point for Viennese architects and planners, both from an academic point of view (for students and lecturers in the two fields of study) and for colleagues from Viennese architecture and urban planning offices. From this point of view, it is incomprehensible that owing to a decision on the part of the TU Library, the position in charge of the Urban Design Library was terminated at the end of February 2020. Since then, care of the Urban Design Library has been carried out as an additional task by employees of the Urban Design research unit; owing to scarce personnel resources, only limited services can be provided.

There is still the option of a faculty library; building on the current holdings of the now 120-year-old Urban Design Library (approximately 40,000 volumes) it could play an important role as an additional interface for our two fields of study.

3. POTENTIALITIES AND CHALLENGES FOR THE FUTURE

Criticism of Austrian spatial planning practice, which has intensified, in part owing to the context of the climate crisis (Berger & Springer 2012), is no longer limited to topics such as land take, urban sprawl or the arbitrariness of area designations, but can also be found in the academic discourse on spatial planning (Schindegger 1998). For the time being, the political reality and fear of losing power (at the municipal level) and lobbying (at the provincial level) are all that prevent a complete paradigm shift. Today, the problems of

an Austrian landscape spoilt by housing sprawl are being raised by the most various initiatives (Gruber 2018) as well as by the first legislative amendments that seek to counteract past developments.

Our faculty adopted more sustainable planning approaches a long time ago. A better coordination of teaching and cross-curricular research collaboration which, so far, have failed, partly owing to personal sensitivities, now seem to become possible. For instance, the Institute of Urban Design and Landscape Architecture and the research unit for Urban and Regional Research will prioritise the topic of climate sustainability in research and teaching through a joint tenure.

From regional planning to local spatial planning, issues are closely connected to urban design. Where a city ends and a region begins can no longer be determined; indeed, one is not conceivable without the other, anyway. Nevertheless, very diverse approaches to planning processes, as well as varied job descriptions, can be found amongst planning professionals and this results in various interface problems. The scale-based split of planning into strategic considerations and concrete implementation steps leads to a thematic incompatibility and to spatial dispersion, which contribute to today's problems in terms of settlement structure.

These gaps in planning culture will be overcome, starting in the academic sphere. Collegial project work during one's studies can help develop an understanding of common concerns, while curricula that are barely interlinked could be brought closer to each other or, possibly, into a common foundation course. Where, on the one hand, the focus might lie on administrative and functional issues, on the other hand, spatial design would be given priority.

In future, overcoming these discrepancies will be indispensable if we wish to achieve a sustainable, resource-efficient, and sustainable design of our habitats. For if we do not learn to work together in a collegial, interdisciplinary manner, we will not attain the goals required to save our planet.

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Wurzer R. (1969). Über die Ausbildung von Städtebauern und Raumplanern – Probleme und Möglichkeiten. Reprint, in: Berichte zur Raumforschung und Raumplanung 3, Österreichische Gesellschaft für Raumforschung und Raumplanung. Vienna, New York: Springer Verlag, 1996.

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Wurzer R. (1985). Über die Entwicklung der Städtebaulehre an der Technischen Hochschule Wien bis 1959. Reprint, in: Berichte zur Raumforschung und Raumplanung 5/6, Österreichische Gesellschaft für Raumforschung und Raumplanung. Vienna, New York: Springer Verlag, 1996.

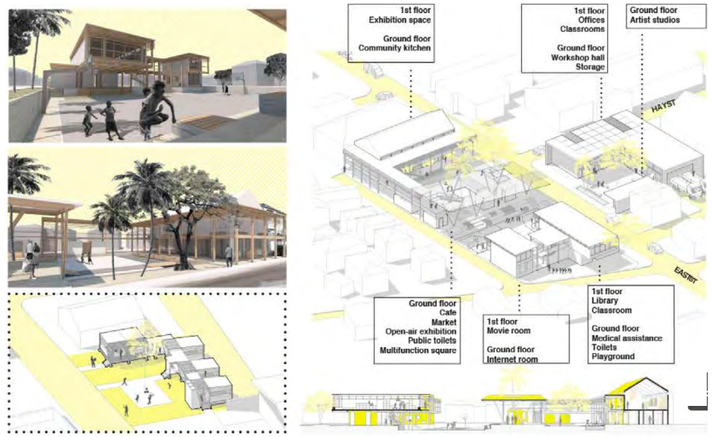
SELECTED STUDENT WORK AT THE URBAN DESIGN RESEARCH UNIT

DIY Grants Town

in Nassau (Bahamas)

Design / P3 Nassau Urban Lab (2015/16 WS)

Authors: Basilis Neururer, Vlad Popa



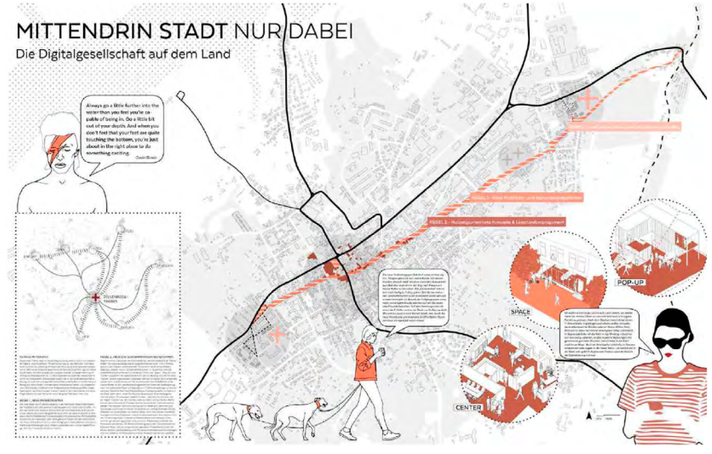
In the middle of the city

Digital work as a removals assistant — new urban development strategies for digital pioneers in the small town of Zeulenroda-Triebes (Thüringen)

Master thesis (p. 209)

Authors: Nina Zawosta, Susanne Böcherer

Supervision: Petra Hirschler, Andreas Hofer



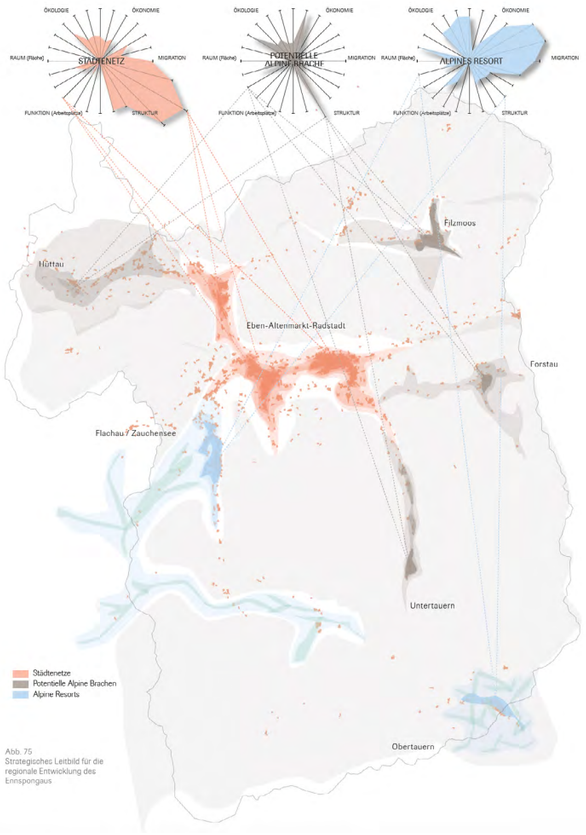


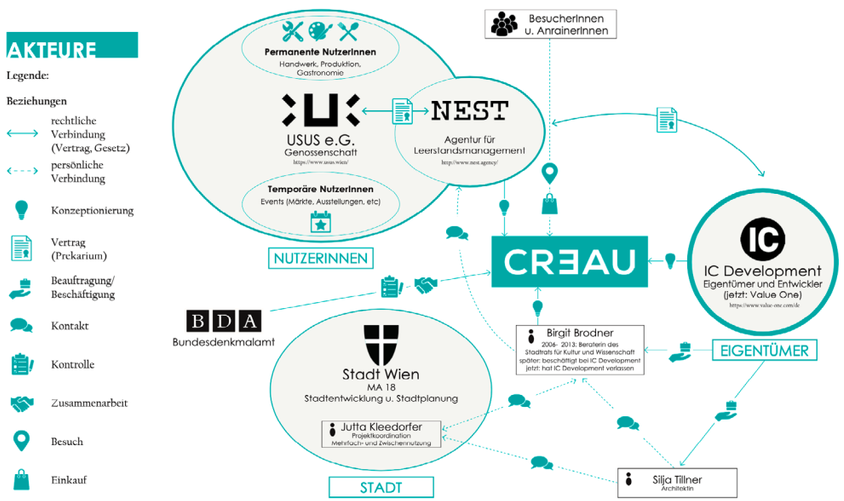
Abb. 75
Strategisches Leitbild für die regionale Entwicklung des Ennspongaus

Ennspongau's strategic mission statement

Strategic Mission Statement for Regional Development in Ennspongau (Salzburg)

Master thesis (2012)

Author: Daniela Allmeier



CREAU

Temporary use project in Vienna

Development Control Module (2019/20 WS)

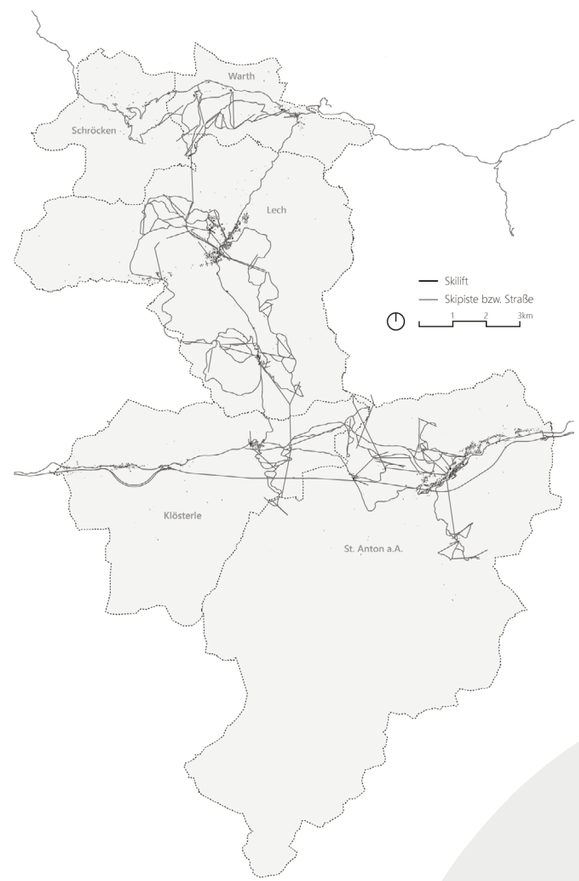
Authors: Anna Brand and Sammy-Jo Steinbacher

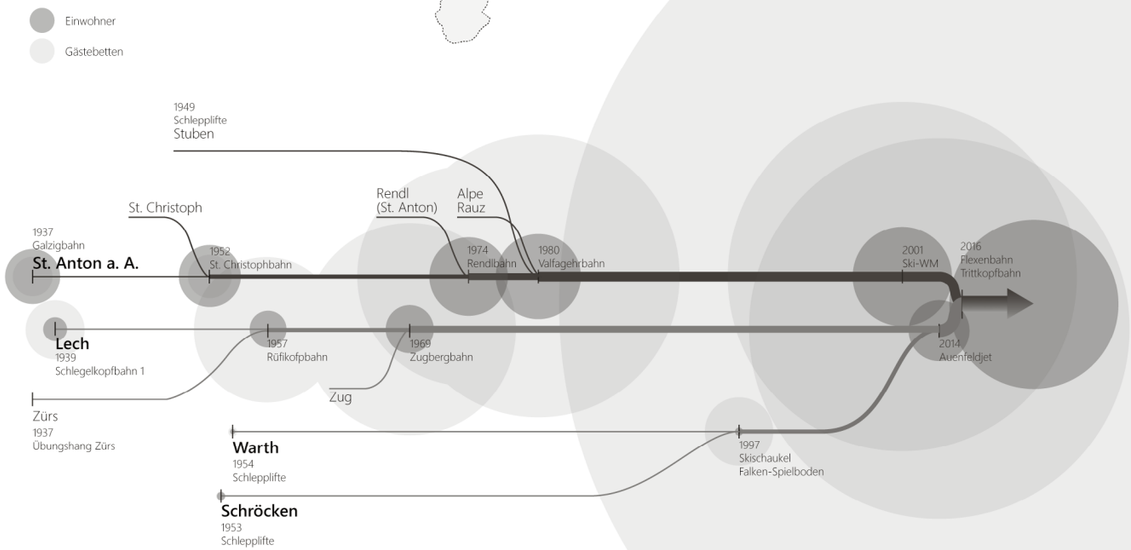
Networking & growing together

Ski Arlberg

Master thesis (2020)

Author: Annika Michel





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PARADIGM CHANGES AND GRAND CHALLENGES

Landscape planning in the context of 50 years of spatial planning education

LANDSCAPE ARCHITECTURE AND PLANNING RESEARCH UNIT

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'The growing awareness of the importance of landscape is attested by the many "new" landscape disciplines that have emerged in recent years, such as Landscape Ecology, Landscape Archaeology or Landscape Urbanism. In architecture and spatial planning, too, the "rediscovery" of "public space" has increasingly moved centre stage in planning tasks — a topic that has always been key for landscape architecture.'

R. STILES ET AL.

1. A CONTEMPORARY UNDERSTANDING OF LANDSCAPE ARCHITECTURE AND LANDSCAPE PLANNING

Just as spatial planning and architecture, with their own priorities and peculiarities, are viewed as distinct disciplines, landscape architecture is more than just a 'green specialism'. It is a distinct discipline and profession that has many interfaces with architecture and spatial planning.

'Landscape architecture' — in English an umbrella term for all related disciplines — is the professional field that deals with the planning, design, and management of landscapes, and their values, for the benefit of both present and future generations.

So far, so good, but what does 'landscape' mean for us today? The European Landscape Convention has defined this notion very comprehensively and holistically: landscape *'means an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors;* [...] [the Convention] *covers natural, rural, urban and peri-urban areas. It includes land, inland water and marine areas. It concerns landscapes that might be considered outstanding as well as everyday or degraded landscapes.'*

In the wider international discourse, the landscape is thus all-encompassing and by no means limited to green spaces, national parks, nature preserves or even rural areas. Landscape knows no territorial limitations, neither beginning nor end. Freely adapted from Hans Hollein's *'Everything is Architecture'*, the Landscape Convention's answer is: *'Everything is Landscape'*! Even though Austria has not ratified the Landscape Convention (yet?), it has been shaping scientific discourse for almost twenty years, and not only in Europe. This holistic and all-encompassing approach has shaped the self-image of the landscape architect profession for many decades.

At the time when spatial planning was born at the TU Wien, landscape architecture was already being taught at university degree level in various foreign universities and had already been differentiated into various specialist areas — such as open space design and landscape planning, as well as garden history.

2. YESTERDAY'S WORLD — LANDSCAPE PLANNING IN THE CONTEXT OF SPATIAL PLANNING 50 YEARS AGO

'We are all children of our times'. This applies not only to us humans, but also to all institutions in which our social values and challenges manifest themselves. This is especially true for scientific disciplines. The establishment of spatial planning in research and teaching, and thus also the establishment of landscape architecture, were *'children of yesteryear'.*

Just as formative as the spatial and temporal context was the prevailing intellectual landscape within which the discipline developed and came of

age. The 1970s were a time of social upheaval. Despite all ongoing social changes, the planning disciplines were still strongly influenced by functional modernism which, in its various forms, had dominated the twentieth century and was now waning. Characteristically, the conviction that the world can and should be reorganised according to rational and scientific principles, because the 'old' world had failed, was dominant.

Indeed, the ideas of the modern era, which featured order, function, and rational thinking and behaviour, made the notion of spatial planning possible at all in the first place. Consequently, the principles of waning modernism also shaped the then emerging spatial planning education, along with its modest landscape planning components.

While modernism manifested itself in the visual arts, architecture, music, and literature before and around the turn of the twentieth century, spatial planning as we understand it today was developed in Europe only after the Second World War. As a result of catastrophic destruction, cities not only had to be rebuilt, but also reorganised; rural areas had to be rearranged in order to produce food even more efficiently. Spatial planning was also called 'town and country planning' and as a distinct academic discipline, its core tasks were viewed as spatial development and post-war reconstruction. In this constellation, landscape and open spaces also had a pertinent role to play.

Almost half a century before spatial planning established itself as a distinct educational course at the TU Wien, the first spatial planning training courses had started in the USA. In 1923, a master's degree in urban planning was set up at Harvard University, nearly twenty years after Frederick Law Olmstead Jr. (the son of the planner of New York's Central Park) had founded a study course for landscape architecture at the same institution (in 1901). By international standards, Austria was lagging behind: until 1970, spatial planning was considered part of architecture or geography.

Indeed, in Austria, the sequence of events was reversed. A good twenty years after the foundation of spatial planning at the TU Wien, a standard study course in landscape planning and landscape management was launched at Vienna's University of Natural Resources and Life Sciences. When the spatial planning study programme was set up at the TU Wien in 1972, the Institute for Landscape Management, Landscape Planning and Garden History was also founded in order to contribute to the new study programme as well as to continue previous architectural teaching. Until that time, landscape architecture at the TU Wien was mainly found in courses with an emphasis on design within architecture studies.

'Garden history' remained, whereas landscape planning was strongly influenced by the paradigms of rationalist modernism. Here, too, it was hoped that objective science might form the basis for a neutral and rational approach to open spaces and landscapes.

In the early 1970s, the scientific focus shifted to the environment. In 1970, President Nixon signed into law the National Environmental Policy Act which, for the first time, legally secured environmental impact assessments in the United States. In 1973, the Federal Nature Conservation Act was enacted in the Federal Republic of Germany. At the core of this legislation was the wish to create

a binding planning toolkit for the preservation and development of landscapes. In Austria, too, the quality and value of landscapes was to be determined from an environmental point of view thanks to relevant assessment methods; recognised standards should precisely define open space requirements and determine optimal locations. This view was clearly derived from the natural sciences. Planning was the task of 'experts' who were to be trained at the TU Wien from now on. Thanks to their objective methods and expertise, they were to decide what was right for the general public.

Although the principles of modernism did influence research and teaching at the new Institute for Landscape Management, Landscape Planning and Garden History, as well as the entire spatial planning sector in Austria, signs of a paradigm shift were multiplying, especially in international circles. According to Charles Jencks, the architectural critic, the beginning of the end of modernism was symbolically heralded in 1972 by the demolition of the modernist Pruitt Igoe housing estate in St Louis, Missouri; at the same time, in far-away Austria, spatial planning education at the TU Wien was just being 'ramped up'.

Soon afterwards, the increasingly evident penetration of the social sciences and its claims into research and teaching consummated the farewell to modernism. The natural science approach to defining a landscape as a clearly measurable geographical, ecological, and historical structure was replaced by a new conception of planning in which human beings generally (and their perceptions), rather than planners, were placed at the centre stage of considerations once again.

Landscape *'means an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors'* (European Landscape Convention 2000, Article 1a). The Convention, which entered into force in 2004, expressed the findings of the Humanities accordingly.

Around the same time, landscape architecture at the TU Wien became the hub of professional discourse in Europe. The research unit initiated and led a EU co-financed thematic network: LE:NOTRE (Landscape Education: New Opportunities for Teaching and Research in Europe). This project (later funded by Socrates and then by ERASMUS) ran from 2002 to 2013; it involved over one hundred European higher-education institutions in the field of landscape architecture as well as several academic institutes overseas.

Within the framework of the project, initial attempts to provide internet-based distance learning in landscape planning were developed and tested. The emphasis lay on the international context and international participation.

3. LANDSCAPE PLANNING IN THE CONTEXT OF SPATIAL PLANNING TODAY

If landscape is understood as a holistic and complex system (as stated in the European Landscape Convention), then it is obvious that all planning interventions in space will, at the very least, bear upon the landscape, if not directly have an impact on it. Landscape planning is thus a key factor in spatial planning and, accordingly, needs to be integrated into the curricula of spatial planning courses at the TU Wien at all levels. Even though there is a distinct degree programme at Vienna's University of Natural Resources and Life Sciences, the countless interfaces between the disciplines require

a mutually constructive dialogue if we wish to be able to design space, and landscapes as well, in a sustainable and integrated manner.

The growing awareness of the importance of landscape is born witness to by the many 'new' landscape disciplines that have emerged in recent years, such as Landscape Ecology, Landscape Archaeology or Landscape Urbanism. In architecture and urban planning, too, the 'rediscovery' of 'public space' has increasingly moved centre stage in planning tasks — a topic that has always been key for landscape architecture.

Landscape architecture and planning have achieved particular prominence in recent years in the context of the growing environmental crisis. Both the climate crisis and important issues such as biodiversity and health are domains to which landscape and open space planning make an important contribution. Against this background, the significance of an efficient green infrastructure has become apparent. Given the growing interest in 'nature-based solutions' and 'ecosystem services', we can almost detect a new paradigm shift that puts natural science solutions in the spotlight again. We are not experiencing a renaissance of the 1970s, but it seems as though a sense of neo-modernism displaying natural science characteristics might be replacing the postmodernism of landscape architecture.

From the point of view of the research unit, it would be very important to strengthen the role of landscape architecture and planning accordingly within spatial planning education at the TU. But desires and objectives are one thing, available resources quite another. This is all the more true since the research unit, with staff levels comparable to those of other planning fields, not only must deal with spatial planning, but also with architecture, which boasts much larger student numbers.

Using existing academic resources as effectively as possible is the logical strategy that the research unit has been pursuing for a long time. In practice, it has concentrated on topics that affect architecture and spatial planning in equal measure for many years. 'Intermediate scale' topics, from the urban development level to the municipal level, have been teaching priorities in recent years.

Nevertheless, the research unit has also made significant contributions to the field of garden history as well as to regional landscape planning and development.

4. THE 'GRAND CHALLENGES': ABOUT THE FUTURE OF LANDSCAPE PLANNING WITHIN SPATIAL PLANNING

As the introduction to the Science Policy Briefing of the European Science Foundation, 'Landscape in a Changing World', states: *'The major grand challenges facing our society are embedded in landscape: climate change, energy needs, health and safety, food security, urbanisation and migration.'*

In this context, the term 'landscape' may be understood as synonymous with the term 'space'. Together with the preamble to the Landscape Convention, which acknowledges, amongst other things, *'that the landscape is an important part of the quality of life for people everywhere: in urban areas and in the countryside, in degraded areas as well as in areas of high quality, in areas recognised as being of outstanding beauty as well as everyday areas'*, the Grand Challenges formulate those tasks that spatial planning and landscape planning will have to face in future.

Of all these issues, **climate change** is certainly the most pressing and all-encompassing. Owing to climate change adaptation, landscape and open space planning are to play an essential role here. Just like the landscape, climate change is also an issue that *'covers natural, rural, urban and peri-urban areas'*, yet urban landscapes and their inhabitants are particularly affected: on the one hand, because the effects are especially noticeable in urban areas owing to high levels of sealed land-cover and a low proportion of greenery and, on the other hand, because precisely in these built-up zones, a particularly large number of people suffer from negative impacts. As for the long-term effects of climatic changes in rural areas — on ecosystems, agricultural and forestry production, and on the dynamics associated with these — these can hardly be quantified today. Hence adaptation strategies at various levels will acquire increasing significance as a field of research in spatial and landscape planning.

The **Urbanisation and Migration** Grand Challenge refers to the process of unrestrained urbanisation and all related issues. Traditionally, in the urban context, the role of open space and landscape was mainly associated with the function of 'recreation'. Urban green spaces or open spaces were often considered 'desirable' but not 'strictly imperative'. In recent years, we have begun to understand that these are not just 'options'; rather, an efficient green infrastructure is an essential basis of life for our cities and metropolitan areas. In many rural areas, the dynamics of migration and its associated contraction processes constitute an increasing challenge that has a lasting impact on the entire infrastructure and, also, on the productive capacity of the landscape.

Pictures of overcrowded green and open spaces during the COVID-19 crisis clearly showed us how important reasonably high-quality green and open spaces are in terms of **Health and Safety.** The contribution that green space can make to our health is beyond dispute. Its positive effect on our health and well-being has been proven in numerous studies over recent years. From now on, we are no longer talking about quality of life but, rather, about a vital necessity.

As regards **Energy Needs,** challenges touch upon several levels. On the one hand, the form of energy production has a direct impact on the landscape, ecosystems, and natural scenery. On the other hand, energy demand is closely linked to the transport issue. Energy-saving sharing models and other sustainable forms of transport have the potential to make us completely rethink road space as part of our cities' green infrastructure. The quality of housing issue is closely linked to the question of the social quality of urban space. If the need for 'green space' can be satisfied in the immediate residential environment, escaping to the countryside on the fringes of urban regions will be largely dispensed with.

Food Security is increasingly becoming a global challenge, on the one hand owing to steady population growth, urbanisation, the loss of valuable soils and, on the other hand, because of the impacts of climate change on global agricultural production. In this context, 'urban gardening' and 'urban agriculture' should be seen as social movements above all, if only because they are only accessible to a small, privileged fraction of the urban population. They are

rather unlikely to satisfy the demand for food in our cities. High-rise gardening for herbs and vegetables is not much more than an utopian fantasy. However exciting such experiments may be, at a strategic and global level, they are unlikely to exert much influence on the global food situation.

Increasingly serious **Biodiversity Loss** is closely linked to the above-mentioned 'Grand Challenges'. Ecosystems are losing their balancing and buffering functions, and becoming increasingly unstable. In the future, a momentous task for landscape and spatial planning will be to stabilise damaged ecosystems through appropriate, large-scale rewilding measures and protect functioning systems accordingly, in order to better compensate for the consequences of climate change, such as fires, severe weather, storms, drought, etc. Large areas of forest will have a special role to play owing to their ability to bind CO_2 emissions.

5. HOW WILL THESE ISSUES BE ADDRESSED IN TEACHING AND RESEARCH?

The 'Grand Challenges' described above constitute a programme for future teaching and research in the fields of landscape architecture and landscape planning, but fortunately the future is already here, and the research unit has been dealing with these topics for some time in modules, bachelor's and master's projects, dissertations, and research projects.

It is the essence of landscapes that many of the Grand Challenges cannot be addressed individually in teaching or research but, spatially embedded at various scales, must be tackled in an integrated manner. Both in teaching and research, it is precisely in the interfaces between spatial planning and architecture that a particularly strong potential can be found.

The following examples will provide a brief look into some of the topics covered.

Modules: The Bachelor's 'Landscape Resources' optional module offers an exciting platform for interdisciplinary collaboration. For several years, this optional module has been coupled with the 'Open Space and Landscape' module for architecture master's students. The didactic objectives are to network competencies, to promote integrated planning ideas, and to stimulate professional dialogue between participants in both courses of study. The planning task is worked on by mixed teams. Thus, the various scale levels of the design are explored and solved jointly. Each year, the course focuses on a specific thematic priority concerning current challenges faced by open space planning in built-up urban or rural regions. Together the students develop strategies for dealing with these challenges; they create ideas and sketches for the implementation of design measures for a concrete project area. For example, in the context of the topics 'Green'o'polis — green paths into the city' (2018) and 'The city as a sponge' (2020), students dealt specifically with the topics of climate change and green-blue infrastructure.

Master's projects: In the past three years, three master's projects have tackled the topic of `Development of new strategic infrastructure for an ecological urban redevelopment', each of them using case studies from Vienna. All three projects, 'Vienna: Streets Ahead', 'Grey-Blue-Green' and 'Vienna Water', were jointly carried out with architecture students. In all cases, climate change adaptation was the key topic, but the point was always how the measures required could be designed and implemented at the city level.

In Vienna: Streets Ahead, the street system served not only as a symbol of the 'lifeline' of the city, which as a network sustains the urban fabric, but also as an intervention space for the development of climate change adaptation measures. The measures were tailored to Vienna's street types and should be effective in all corners of the city.

Grey-Blue-Green took this topic further and dealt with the notion of green-blue infrastructures in urban settings. The discussion was about how streets, the so-called 'grey infrastructure', might make a strategic contribution to climate change adaptation.

The Vienna Water project tried to place the topic of 'blue infrastructure' in the limelight. At the hottest time of the year, when green infrastructure is most important to cool the city, the vegetation suffers from water stress and may not be able to perform its functions (cooling, shading, and CO_2 absorption). Only thanks to blue infrastructure can green infrastructure be effective.

The water cycle in the city includes not only rainfall, which is distributed unevenly across districts, but also the 130-litre a day that flow from the Alps into the city for every Viennese. In order to develop a blue infrastructure strategy that functions as a climate change adaptation measure, all aspects of urban hydrology should be considered.

Diplomas/Master's dissertations: Three current Master's dissertations that deal with Grand Challenges will be briefly mentioned here by way of example: two of them deal with climate change, the third with food security in an urban context.

Bianca Pfanner's study, 'Urban green-blue infrastructure in the street network as an instrument of climate change adaptation' deals with the development of a strategy for blue-green infrastructure in the district of Leopoldstadt in Vienna.

Most climate change studies and strategies have been conceived for large cities. Although today people do mostly live in urban regions, there are many small towns in Austria that likewise are affected by climate change. Johannes Stehno (2020) has studied the situation of such towns in Lower Austria and developed appropriate adaptation measures.

Although the topic of 'urban agriculture' has been described as, primarily, a social movement involving a privileged minority, there is one important exception. It is to be found in Vienna: intensive vegetable production, which is mainly concentrated in the district of Simmering. 'Urban agriculture' may well be a fashionable term that Vienna's urban planning authorities also propagates at the residential scale, but the official urban planning strategy, 'The Productive City', does not mention Vienna's vegetable production. In 'Market gardening in glasshouses and polytunnels in Vienna', Kathrin Rundel (2020) explores this discrepancy and develops proposals on how to revalue and safeguard this branch of production.

Research projects: An important aspect of 'landscape research' has always been sustainable urban development, especially with regard to the need for green space provision and to increasing the associated spatial quality and quality of life. The immediate residential environment and public space play a decisive role in this. Since 2008, climate change adaptation has become a research priority in the research unit. In this regard, several research projects have made an important contribution to the city of Vienna's discourse, and to the debate beyond it.

One project, 'Vienna's Seestadt Aspern — Subproject 1: Open Space and Microclimate: Basics for Climate-Sensitive Planning in Aspern' (Haus der Zukunft plus, 2010–2011) developed a concrete catalogue of measures — based on a study of the climate-sensitive aspects of open space design — as a set of recommendations for property development competitions.

Another project, 'Urban fabric types and microclimate response — assessment and design improvement' (ACRP 3rd call 2011–2014) created a typology of various urban forms in Vienna with regard to their climate sensitivity and defined specific priority lists of design measures for these. The outputs of this project provided a concrete input to the Urban Heat Strategic Plan of the City of Vienna (2015).

The project, 'LiLa4Green — Accompanying Living Lab for the Implementation of Green-Blue Infrastructure Measures in the Smart City Vienna' (Smart Cities Demo, 2018–2022) rigorously dealt with the topic of measure implementation. In addition to a detailed potential analysis of the implementation of measures in street spaces (in collaboration with students of the TU Wien), here the emphasis lies on the involvement of local residents and stakeholders — as part of a living lab process — at an early stage in order to promote acceptance and the actual implementation of concrete measures (https://smartcities.at/projects/lila4green).

Another topic, the management of UNESCO World Heritage Cultural Landscapes, was discussed and further developed between 2013 and 2016 in the course of several research projects and student projects together with the Federal Chancellery, the Land of Upper Austria, and representatives of the Hallstatt-Dachstein region.

Cultural landscapes often play a special role for the development of rural regions. The research addressed the following questions: how and in what form might a management plan for the Hallstatt-Dachstein UNESCO World Heritage Cultural Landscape be implemented in the region? With the help of a study of landscape ecology and landscape history, initial approaches to, and the principles of integrated landscape development were worked out within the framework of a student project for the following aspects: settlement, open spaces, and cultural landscape, as well as tourism. Another study and several research contributions by the research unit dealt with the perspective of the actors involved as regards the topic of regional development and the management of a UNESCO World Heritage Cultural Landscape, as well as a conceptual framework for a management plan. The conceptual framework formulates basic building blocks that make it possible to develop a management plan.

6. OUTLOOK — THE NEXT 50 YEARS OF LANDSCAPE PLANNING IN THE CONTEXT OF SPATIAL PLANNING

Undoubtedly, the greatest challenge facing us is climate change and its consequences. Climatic changes have a significant impact on all other 'Grand Challenges' and, in many areas, act as multipliers. What we cannot estimate are the actual changes, mainly because simulations contain too many open parameters that, from our current perspective, cannot (yet) be properly narrowed down. This is not so much about calculating the rise in global temperature but, rather, about the 'side effects', namely, the ecological consequences, which will significantly influence our social and economic behaviour. But what we certainly do know, and already clearly feel, is the fact that all these impacts will massively affect our physical 'space', our immediate living environment. Landscape planning, as a natural science planning discipline, can make a significant contribution to basic research, to CO_2 reduction and, above all, to adaptation to changed and demanding framework conditions.

In rural, agricultural areas above all, profound changes in agricultural and forestry production are to be expected in the medium term; ultimately, these will have an impact on our eating habits. Essentially, the cultural landscape will have to be thought and planned anew. It is not only the actual arena of food production or recreation space, but also cultural heritage and natural space, which must be protected and cared for in the future as well, under more difficult conditions.

In urban regions, the main task will consist of retrofitting an operational green-blue infrastructure. Given the increasing number of heat-related fatalities in affected cities, effective green spaces will no longer be about one's quality of life but, more and more, about the necessity of survival. This ecological, sustainable restructuring is already a core priority at the research unit and will certainly be explored in greater depth in future.

In order to tackle the problems stemming from global warming and its immediate consequences, fundamental social change is needed, which is likely to profoundly transform the living environment that we are accustomed to. At the TU Wien, spatial planning will need to impart those planning and scientific competencies to graduates who, in the future, will plan for and positively influence change, through their specialist knowledge.

The next 50 years will be hot, but certainly not boring!

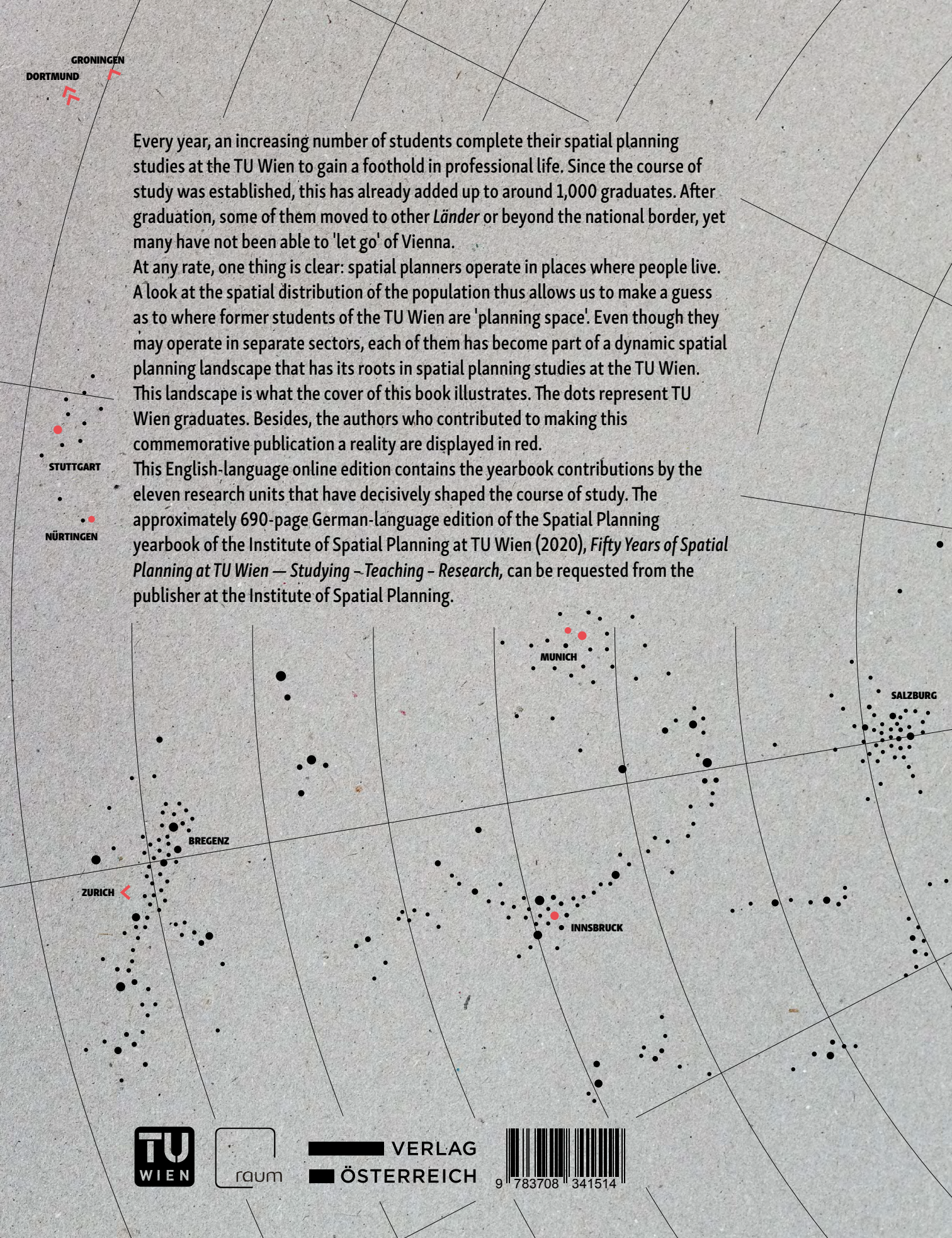
IN LIEU OF AN AFTERWORD

IT'S ONLY ROCK'N* PLANUNG, *BUT WE LIKE IT

Job description for a spatial planner: *Street fighting (wo)man*
Spatial planning motto: *You can't always get what you want*
Feeling during 721st public participation procedure: *Jumpin' jack flash*
Spatial planners —playthings of the Mighty: *Tumbling dice*
Favourite spatial planner's place: *Exile on Main Street*
Given the precarious employment conditions: *Gimme shelter*
Yet every morning all over again: *Start me up*
On the binding force of urban development plans: *You don't have to mean it*
At the sight of a good modal split: *You got me rocking!*
Spatial planner's professional ethos: *Love is strong*
On the ability of municipalities to be accountable for Local Plans: *Mixed emotions*
About Berlin Airport and other public transport infrastructures: *Waiting on a friend*
Who disrupts planning parties: *Neighbours*
Feeling as climate protection, once more, is not taken seriously: *Shattered*
Spatial planning pioneer: *Respectable*
Effective climate protection measures: *Miss you*
Whenever spatial planners believe their ideas are taken seriously: *Just my imagination*
Whenever a foundation run by a car manufacturer awards an environmental grant: *Sympathy for the devil*
Whenever spatial development plans are not taken into account: *Can't you hear me knocking?*
Spatial planner out on a limb: *Like a rolling stone*
Unwanted state of affairs after holding a regional conference: *Let it bleed*
A location without any Austrian spatial planners: *Sweet Virginia*
Once the pop-up cycle path has been built: *Happy*
Morale-boosting slogan for climate protection: *Stop breaking down*
During the Covid pandemic: *Living in a ghost town*

And now: *Rip this joint!*

Compiled by *Mick G.*



Every year, an increasing number of students complete their spatial planning studies at the TU Wien to gain a foothold in professional life. Since the course of study was established, this has already added up to around 1,000 graduates. After graduation, some of them moved to other *Länder* or beyond the national border, yet many have not been able to 'let go' of Vienna.

At any rate, one thing is clear: spatial planners operate in places where people live. A look at the spatial distribution of the population thus allows us to make a guess as to where former students of the TU Wien are 'planning space'. Even though they may operate in separate sectors, each of them has become part of a dynamic spatial planning landscape that has its roots in spatial planning studies at the TU Wien. This landscape is what the cover of this book illustrates. The dots represent TU Wien graduates. Besides, the authors who contributed to making this commemorative publication a reality are displayed in red.

This English-language online edition contains the yearbook contributions by the eleven research units that have decisively shaped the course of study. The approximately 690-page German-language edition of the Spatial Planning yearbook of the Institute of Spatial Planning at TU Wien (2020), *Fifty Years of Spatial Planning at TU Wien — Studying – Teaching – Research*, can be requested from the publisher at the Institute of Spatial Planning.

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