

*‘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.’*

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## LOCAL PLANNING: MUNICIPALITIES AS SPATIAL RESEARCH LABS

### LOCAL PLANNING RESEARCH UNIT

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*'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.<sup>1</sup> 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,<sup>2</sup> which has been an integral part of today's Institute for Spatial Planning since 2004.<sup>3</sup> 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).<sup>4</sup>

**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<sup>5</sup> 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<sup>6</sup> 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)<sup>7</sup> ‘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:

<sup>4</sup> In 2012, the dissertation received the Rudolf Wurzer Prize from the City of Vienna and TU Wien.

<sup>5</sup> [www.forschungslabor-raum.info/](http://www.forschungslabor-raum.info/)

<sup>6</sup> The dissertation was awarded the Ressel Prize of TU Wien in 2017.

<sup>7</sup> <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’,<sup>8</sup> 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

<sup>8</sup> Three ‘logbooks’ are already available (International Doctoral College Programme’s Spatial Research Lab, 2012, 2016 and 2020).

field of the Faculty of Architecture and Planning, as well as in the ‘Energy and Environment’ research priority of the TU Wien.

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)

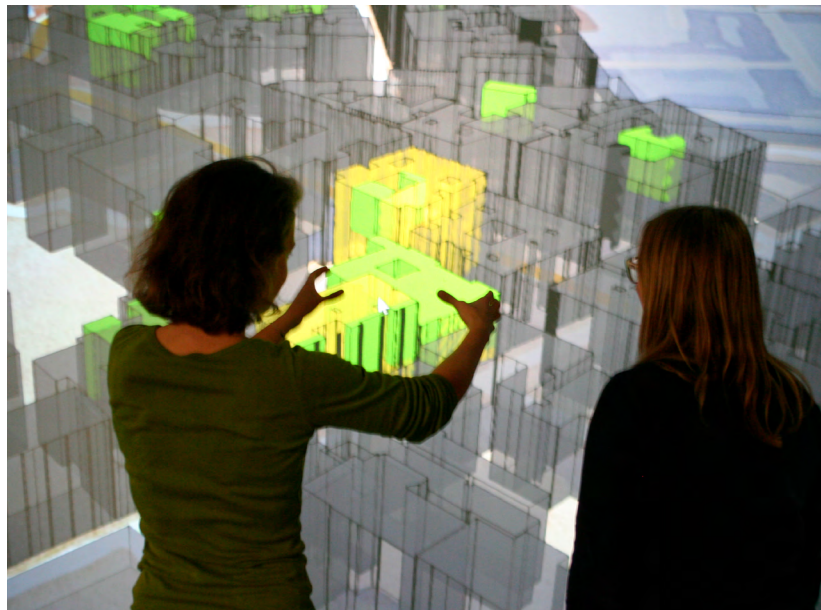
**Location as a common good? On the place of residence in urban development planning (Kerstin Pluch)** Cities worldwide are facing a worsening housing crisis: for many people housing is becoming an emergency as sharply rising rents become more and more unaffordable. The financialisation of the housing 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<sup>9</sup> 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.

<sup>9</sup> <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 Scheuven:

**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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