

SPECIAL ISSUE: Urban and regional infrastructures

Institutionalizing Digital Infrastructures: Discursive Institutionalization of Public Platforms in Vienna

Astrid Krisch, TU Wien

Abstract

Critical scholars dealing with platform capitalism, platform urbanism and smart city developments have emphasized manifold challenges connected to the rise of digital platforms and in particular the “Tech Titans”. Due to their economic and political power, platforms are by now often understood as new forms of infrastructures, thus making them an inherent public issue. Alternative models of developing platforms as public infrastructures, such as the emerging concept of platform municipalism point to an ideological shift in planning ideas. However, research on the process of developing planning ideas and their connection to the actual implementation of public platforms is still rare. Thus, this article focuses on the discursive institutionalization of public platforms in Vienna, their ideological foundations and the discursive interactions between different agents to implement new digital infrastructures. The article finds that there has been an ideological shift in the strategic orientation of planning ideas towards a more human-centred development of platforms as new infrastructures. However, lack of coordination and institutional barriers persist. The article critically reflects on the role of local governments in developing digital infrastructures and thus contributes to debates on smart urbanism, platform urbanism and platform municipalism by providing in-depth knowledge on the case of Vienna.

Keywords

Platform municipalism, Digital infrastructure, Urban planning, Discursive institutionalism, Vienna

Introduction

Platforms as new forms of infrastructures (Krisch & Plank, 2019) are increasingly present both in scientific debates and in our everyday lives. Similar to the infrastructure development of the 19th century, where rail, water or electricity networks were part of industrialization, issues regarding the design, regulation and governance of platforms as digital infrastructures are

Corresponding author: Astrid Krisch, TU Wien, astrid.krisch@tuwien.ac.at, ORCID: 0000-0002-9720-4178

again on the rise. Although seemingly invisible and self-evident, infrastructure systems become particularly visible through their inherent negotiation processes and political conflicts (Tomaney, O'Brien and Pike, 2018). The numerous debates surrounding the regulation of large platforms (e.g. EU Digital Services and Markets Acts) show the negotiation processes and fights over future institutional arrangements.

In this article, I refer to platforms as more than just intermediaries between different groups of actors (Gillespie, 2018). I build on the definitions of platforms as specific computer programs or smartphone applications forming a global technological megastructure (Barns, 2020), constituting materially, institutionally, financially and socially new information configurations (Chiappini, 2020) and acting as “governing systems that control, interact, and accumulate” (Nash et al. 2017, p. 369). However, as Gillespie (2018) argues, platforms are not fixed entities, but changing environments, which is a central characteristic to understand their power. Platforms like Google, Facebook or Amazon, but increasingly also local platforms such as mobility platforms, act as essential information infrastructures determining the distribution of and access to news, ideas, and information on which our economy, culture, and increasingly politics are built (Krisch and Plank, 2018).

Literature on the implementation of technology into urban planning agendas has shifted during the last 20 years. While discourses on smart cities have been popular since the 2000s, the debate is increasingly shifting toward a critical view, highlighting the negative consequences of technology-focused urban development (León and Rosen, 2020; Leszczynski, 2016; McQuire, 2021). Discussions around smart urbanism (Caprotti and Cowley, 2019), and recently also platform urbanism (Barns, 2020), have highlighted the influence of technology on our everyday lives. Critical movements are increasingly concerned with the distribution and democratization of platform power and the role of public urban planning in developing alternatives to privately owned and controlled platforms. Especially in light of urban administrations developing citywide digital strategies (Barns, 2020), the concept of platform municipalism is emerging as a social movement to develop a counter design to techno-dystopian visions of the future. It is concerned with the role of local communities in shaping digital transformation and with local governance structures for democratizing digital platforms for urban planning agendas (Thompson, 2020).

As platforms are increasingly understood as new infrastructures (Krisch and Plank, 2019), the role and responsibility of public administrations and local urban planning are important to discuss. The political role of steering platform development can be classified into two main tasks: 1) regulating existing digital platforms; and 2) (co-)building alternative economic and political strategies for locally anchored digital infrastructure models. A better understanding of multi-scale governance structures is a crucial step towards a more comprehensive view of the impact of digital infrastructures on a complex urban world (Barns, 2020). Urban and regional planning are important fields of action for infrastructural

development. Although different logics of action are embedded in existing institutional arrangements and subject to administrative lock-in mechanisms, planning can nevertheless be used at different levels (from local to international) to highlight and actively involve interfaces in infrastructure development (Marshall, 2013).

To enhance the understanding of the evolution of planning ideas regarding platform development and its multi-layered interdependencies between discourses, agents and the respective institutional structures, I employ an institutional approach. Drawing on the theoretical concept of discursive institutionalism (Schmidt, 2008), I apply it to the case of digital infrastructure planning in Vienna. I frame my analysis by focusing on the shifts in planning ideas in recent debates on technology-focused urbanism, embedding the concept of platform municipalism into wider debates on smart and platform urbanism. I focus explicitly on the development of platforms embedded in urban planning agendas, framing the solidification of platforms as digital infrastructures in Vienna. The theoretical framework of discursive institutionalism guides the research to explain, how ideas of platforms for urban development agendas are communicated through agents, which act in certain institutional contexts to support or hinder collective action (Schmidt, 2008). This approach is in line with a constructivist research agenda, methodologically building on interpretative policy analysis (Arts and van Tatenhove, 2004) concerned with power relations and institutional settings.

This article contributes to creating in-depth knowledge on the origin of planning ideas, actor settings and rules of decision-making for digital infrastructures in Vienna, a city regarded as a best practice example for smart cities in international debates (Mora et al., 2019). The concept of discursive institutionalism helps to explain policy change and changes in planning ideas. The article provides insights into when and how transformative discourses occur in politics and society. The empirical analysis then examines the integration of platforms into planning agendas in Vienna to determine whether new ideas have already been successfully disseminated and urban discourses changed. Thus, this article contributes to filling the research gap of discursive institutionalism as a theory, that has previously mostly been applied to study policy changes on national or international level (Schleicher, 2021). This locally specific case study shows that changes in policy ideas have implications on the local level, contributing to the debate on urban governance.

The article first introduces the theoretical framework of discursive institutionalism and explores the ideas in academic literature regarding the implementation of technology in urban planning agendas, identifying ideological shifts from smart urbanism to platform urbanism to platform municipalism. Chapter 3 begins with a short method section and discusses the case of the development of platforms as digital infrastructures in Vienna in detail, drawing on the analytical structure of ideas, discourses and agents. In the final section, I discuss the results and draw conclusions for the research and planning community.

From Smart and Platform Urbanism to Platform Municipalism

Discursive institutionalism as a discourse-based explanation of how ideas are tied to action

Technology in its multiple forms is a central but often implicit element of politics and planning, despite having profound repercussions on the structuring of societies and cities. It is thus necessary to consider, how public governance of platforms and the development of public strategies concerned with digital infrastructures unfold over time, what its conditions are and which effects in terms of institutionalizations and conflicts can be identified. These conditions crucially involve power relations and different interests reflected by digital infrastructure policies. To understand these processes, I apply the concept of discursive institutionalism (Schmidt, 2008) as a theoretical framework and methodological orientation. As I have argued elsewhere (Krisch and Suitner, 2020), the concept of discursive institutionalism is especially well suited to investigate infrastructure development, as infrastructures can themselves be understood as institutions.

As a form of new institutionalism, discursive institutionalism puts emphasis on ideas and discourse (Schmidt, 2008) as important parts within the dynamics of agency, structure, institutions and discourse (see ASID-meta-methodology in Moulaert et al., 2016). As an analytical approach and by taking both ideas and institutional settings into account, discursive institutionalism allows the understanding of political processes and the cultural construction of meaning by tracing how ideas are tied to action. The central rationale behind discursive institutionalism is that ideas are carried through the discursive argumentations and interactions of different agents, forming the basis for collective action, all functioning through their institutional context, within which ideas, discourses and actions are meaningful and effective (Schmidt, 2008). As a pivotal juncture, the institutional context determines where and when actors say what they are thinking of doing. Social processes and power relations within these collective actions are thus the center of attention, aligning with a constructivist perspective (Davoudi, 2018).

Within the theoretical concept of discursive institutionalism, the differentiation between levels of ideas is especially insightful for an analytical approach to urban governance. Schmidt (2008) differentiates between: i) philosophies as the deepest level of generality, which act as background and organizing ideas, values and principles of society; ii) programmatic ideas on the second level defining problems regarded relevant for solving; and iii) policy ideas implementing programmatic ideas and acting as instruments or specific methods that deal with the above defined problems or issues. Ideas are carried through different agents, which act within their specific institutional context and communicate their ideas through forming various constellations (Schmidt, 2008). However, not only do agents

determine how institutions are constructed, but also discourse plays an essential role as an institutionalized structure of meaning, forming the basis for social processes.

In light of recent research focusing on the social science perspective of infrastructure planning (Anand et al., 2018; Barlösius, 2019; Graham and Marvin, 2001), ideas and discourses in their specific institutional contexts are vital to understand how infrastructure systems are created, stabilized and changed over time. Sorensen (2014) argues, that particularly for path-dependencies, which are inherent in infrastructure planning, the analysis of institutions helps to differentiate stable phases of infrastructure development and planning from critical transition periods. Discursive institutionalism provides an entry point to understand how infrastructure shapes political behavior and outcomes and is in turn shaped by them.

Ideological shifts in scientific debates - From Smart Urbanism to Platform Urbanism to Platform Municipalism

Urbanism has been associated with different articulations, from global to green and sustainable or smart in recent years. All of these articulations rely on specific normative framings, values, programs and policies, implementing these articulations as collective actions within the respective institutional context of urban planning. Informed by visions of how a city should look and the self-conception of planning agents, urban planning imposes specific visions how to achieve the current mode of urbanism (Barns, 2020). The visions regarding how to deal with urban challenges have significantly changed over the last 30 years.

The Smart City and the connected smart urbanism notion emerged as the successor to the Global City of the 1990s and the Resilient City of the 2010s (Valverde and Flynn, 2020). Competition between cities and their role in a sustainability transition justified the implementation of technology in urban planning agendas. While in the 1990s smart city became an important concept to discuss the influence of ICT on urban development (Artyushina, 2020), smart urbanism gained momentum to rethink cities' economic and cultural dynamics enabled through smart technologies (Caprotti, 2019). These developments laid the groundwork for the smart city, building on values of a plannable and interference-free flow of urban life (Bauriedl and Strüver, 2017) (see Table 1). The attempt to capture urban processes by measurable data, to evaluate them in real time, and to network urban infrastructure systems into a self-regulating system of systems follows on from functionalist planning theories from the 1960s (Frank and Krajewsky, 2018). Since 2010, cities all over the world have taken up smart city strategies to promote governance opportunities for cities "run on information [...] This has been manifest not only in the operational activities of city governments but also in a shift in the fundamental role and purpose of city governance in the information age" (Barns et al., 2016, p. 24).

Current debates shift towards the notion of platform urbanism (Anttiroiko, 2021; Barns, 2020) as a response to manifold urban questions and challenges raised by an increased utilization of platform logic in society and cities. In contrast to the smart city logic, the values of the notion of platform urbanism are based on a different current from the last few decades, where collaboration, partnerships, stakeholder-involvement and participation was incorporated into urban planning by using platforms as intermediary agents. “There has been a pervasive tendency to increase democratic participation together with self-determination and self-organization, which entails a further shift in planning paradigm” (Anttiroiko, 2021, p. 37). There are some similar ideological threads between platform urbanism, the smart city logic and the notion of smart urbanism, making urban data a central concern to manage cities in real time. Some critical scholars have pointed to the limiting effects of big data on long-term strategic planning, as the focus increasingly shifts to short-term thinking about the effective and efficient management of cities (Batty, 2013).

Table 1: Ideological shifts from smart urbanism to platform urbanism to platform municipalism (Source: own conception based on literature analysis)

	Smart Urbanism	Platform Urbanism	Platform Municipalism
<i>Philosophies /Values/ Worldviews</i>	<ul style="list-style-type: none"> • Cities run on information • Efficient flow of urban life • Technological determinism 	<ul style="list-style-type: none"> • Collaboration, partnerships, participation • Real-time management 	<ul style="list-style-type: none"> • Community wealth building • Politics of proximity • Feminization of politics
<i>Program/ Defined Issues</i>	<ul style="list-style-type: none"> • Austerity, anticipation of future crisis • Evaluation of cities and governments through digital infrastructure 	<ul style="list-style-type: none"> • Governments as enabler and facilitator • Cuts in welfare vs. government innovations • Accessibility of private data 	<ul style="list-style-type: none"> • Reclaim/regenerate local economy • Retooling the state from the inside
<i>Policy Solutions</i>	<ul style="list-style-type: none"> • Open data as “obligatory passage point” for transformation • Optimizing city systems through corporate solutions • Smart city strategies 	<ul style="list-style-type: none"> • Transformation of public services market-/consumer oriented • Legal and governance issues • City wide digital strategies 	<ul style="list-style-type: none"> • Economic & political strategies • Public-common partnerships • Institutional innovations

On the *programmatic level*, smart and platform urbanism are pushed by arguments of austerity, welfare cuts and effectiveness of public governments. Smart cities and smart urbanism pursue a cross-scale digitization ideal driven by competition-oriented governments and international IT companies (Luque-Ayala and Marvin, 2016; Rose, 2019; Söderström et al., 2014). Arguments of cost-saving innovation and anticipation of future crisis (White, 2016)

have increased pressure on city governments and enabled private actors to implement urban experiments with transformative impacts (León and Rosen, 2020; Matern, 2017). Especially concerning data-driven services, there is a tendency of an expert-based urban planning returning with technical actors dominating urban development (Douay, 2018). Concerns about the lack of transparency and accountability of decision-making are rooted in the politics of our increasingly algorithmic society, in which decisions are often “black-boxed” and hidden behind algorithmic intelligence, which only experts are trusted with (Barns, 2020; Sadowski and Pasquale, 2015). City administrations are under pressure to measure and report the performance and impact of their departments to make the public sector more transparent, competitive, flexible and controllable (Morozov and Bria, 2017). The focus has shifted away from “the physical dimension of broadband technology as a fixed infrastructure of the digital economy, towards emphasis of the role of governments as enabler and facilitator of data-driven services” (Barns et al., 2016, p. 21).

More recently, platform municipalism (Thompson, 2020) is emerging as a concept connected to the political and social movements of new municipalism (Vollmer, 2017). These initiatives regard “the municipal” as a strategic entry point to develop comprehensive practices and theories of transformative social change. New technologies are implemented in a community-building and socially progressive way (Hollands, 2015; Russell, 2019). Two main principles guide these social movements: the “politics of proximity”, which focuses on forces that hold a society together by using the urban scale to achieve strategic goals, and the “feminization of politics”, which seeks a new way of political engagement by supporting values of equality and cooperation instead of competition. The objective is to create lasting institutional structures rooted in social wealth (Russell, 2019). By opening up institutions, understood as a series of social processes and social relationships or as norms (Salet, 2018), traditional politics are challenged and institutional innovations enabled (e.g. neighborhood assemblies, participatory budgeting, open source digital voting platforms) (Thompson, 2020).

On the *policy level*, the ideological threads of smart urbanism, platform urbanism and platform municipalism propose different solutions to the above-identified problems. The smart city strategy and discourse has by now reached a hegemonic position (Morozov and Bria, 2017), putting city governments as “bricoleurs of sorts, sorting between diverse kinds of digital products and services, strategies and masterplans, in the effort to divine their digital futures and leverage the benefits of big data and algorithmic intelligence in the service of their urban publics” (Barns, 2020, 171-172). For city governments, the use and distribution of data resulted in open data strategies as an “obligatory passage point” in the transformation of cities into smarter ones (Barns, 2020; Söderström et al., 2014). Smart city policies, aiming at increasing the flexibility, diversity and accessibility of nearly all local services (Bauriedl and Strüver, 2020), shifted globally in framing digital infrastructure as central for evaluating the performance and management of cities and governments (Barns et al., 2016). Platform

urbanism however, “aims to transform and/or take over the operations of city services that tend to be more market or consumer-oriented” (Bauriedl and Strüver, 2020, p. 270).

Platform-centered urban planning will have to prove its legitimacy and adaptability to the requirements of legal and governance issues of democratic decision-making (Anttiroiko, 2021). City governments are understood as central for policy solutions, particularly in using their local democratic governance – understood as a normative framework capturing a way of “rule-making” and the relative allocation of responsibilities and liabilities (Micheli et al., 2020) – to leverage platform businesses in extracting local public value through controlling local resources and regulating local environments (Anttiroiko, 2021). Many governments are developing citywide digital strategies “as a governance intervention to ensure their jurisdictions properly capitalize on the opportunities around data-driven governance” (Barns et al., 2016, p. 25). Cities’ governance structures are thus changing, where cooperation with private actors is playing a greater role in urban development (Douay, 2018). However, with the increasing influence of private actors, the extending private sector is reducing and weakening the role of the public sector, especially in the digital economy. These new market actors often benefit from a restructuring of governance within cities and fluid allocations of power and responsibilities (Micheli et al., 2020), disrupting public administrations’ ability to carry out planning (Douay, 2018).

As a response, platforms are increasingly embraced as spatial imaginaries and political tools for a new kind of collective action and democratic decision-making based on urban rather than state logics and using platform technologies to govern cities. The objective is to re-politicize austerity urbanism and platform capitalism at the local level (Thompson, 2020). With the goal of overcoming capitalism, the new municipalist movements link to the notion of dual power, posing an opposition between “sovereignty” and “governmentality” (Jameson and Žižek, 2016) that operates between transforming political structures from within and creating an alternative polity from without. New municipalism can be understood “as a ‘new spatial imaginary’ manifested as a ‘becoming common of the public’ (Russell, 2019, p. 1001) through ‘public-common-partnerships’” (Thompson, 2020, p. 7). Municipalist initiatives aim at implementing economic and political strategies to break down the boundaries between state and civil society, to democratize decision-making processes and distribute power outside of political institutions (Hamedinger et al., 2019; Russell, 2019). The policy solution to counter the growing dominance of capitalism is utilized through existing groups of local actors and organizations (e.g. locally anchored municipal utilities and local anchor-institutions such as universities, housing associations or hospitals) instead of hoping for major interventions at a superordinate level (Morozov, 2019).

Although recognizing geographical, ideological and socio-cultural dispersion, Thompson (2020, p. 11-12) identifies three distinct models of municipalist ideas using new platform technologies based on their strategic objectives: 1) Civic municipalism (adapted from

the original term “platform municipalism” to emphasize the focus on civic mobilization) seeks to work in, against, and beyond the state through civic mobilization and the establishment of new civic platforms; 2) Autonomist municipalism aims at a political structure outside of the state through cooperatives, communes, and autonomous assemblies by collectively self-organizing; and 3) Managed municipalism tries to make the local state more amenable by democratizing urban economies through technocratic institutions. Although Thompson (2020) uses the term platform municipalism for the first model, in this article I use platform municipalism as an umbrella term to include all three municipalist models using platform technologies to democratically govern the city (see also Krisch and Plank, 2021). All forms of platform municipalism try to counteract the unwillingness of big players of the platform economy to deliver their data to municipal administrations, leaving cities without effective control, by building and developing municipal platforms to at least try to compete with Silicon Valley platforms in some sectors (Morozov and Bria, 2017).

Discursive Institutionalization of Digital Infrastructures: The Case of Public Platforms in Vienna

To illustrate how platforms are institutionalized through discourse, agents and institutional structures, the article examines the city of Vienna, its planning policies and agents concerned with the development of platforms for urban planning purposes.

Methods

The concept of discursive institutionalism serves as a discourse-based explanation of how and when ideas prevail through different constellations of agency within specific institutional relations (Krisch and Suitner, 2020), influencing the development of platforms. I therefore apply a discursive-institutionalist policy arrangement approach, concerned with power in policy analysis, which I integrate with interpretative policy analysis (Dunn, 2012) and critical discourse analysis (Fairclough, 2013) with a close investigation of institutions. The general approach is guided by qualitative document analysis, which outlines the understanding and genesis of planning ideas regarding platforms as digital infrastructures. The policy documents are thematically and inductively coded and the codes are further analyzed in order to construct their basic narratives. The approach follows Keller (2011) in reconstructing the phenomenon structure of digital infrastructure appearing in the documents. The document analysis includes seven strategic planning documents in Vienna, which were published since 2010, concurring with the international tendency towards smart city policies and focus explicitly on the development of digital technologies in urban planning in Vienna. Furthermore, I incorporate the findings of 10 expert interviews (Meuser and Nagel, 2009) with actors from municipal administration and organizations affiliated with the city of Vienna, which are central for the development of platforms as new infrastructures. The analysis of the interviews

follows the same thematic coding and inductive procedure as the document analysis, making it possible to combine the findings and enrich the outcome. The interviews provide information about the development of digital infrastructure policies, the understandings of these policies by different actors, and their stakes in them, and how digital infrastructures in particular, and urban development in Vienna in general are perceived. The interviews were semi-structured and questions were adapted to the particular role and expertise of the respondents.

Results

Vienna (capital of Austria; 1,92 million inhabitants) has a long-standing tradition of strategic planning, formalized in the 1980s with the first urban development plan STEP 1984, which has been updated every 10 years since. The city has a multi-layered strategic planning environment, including comprehensive plans (e.g. the first strategy in 2000, Smart City Framework Strategy 2014 and 2019) and selective plans (e.g. Digital Agenda 2014 and 2019, Data Excellence 2019, Artificial Intelligence Strategy 2019). Its political-administrative system is strongly characterized by social-democratic elements, affecting both urban and spatial planning programs and the structural dimension of institutionalized planning (Hamedinger, 2008). During the 1980s and 1990s, municipal districts were equipped with more power as a result of decentralization measures and expansion of their scope of competencies. These dynamics were accompanied by the creation of municipal funds and spin-offs of organizational units, e.g. municipal utilities. Since the 1990s, the focus lies on administrative modernization and broadening participation (ibid.).

Vienna stood out in international Smart City rankings, including a wide range of criteria (e.g. innovation, quality of life, digital governance) (Mora et al., 2019). Aided by the EU Strategic Energy Technology Plan as a funding scheme for energy and electronic companies, the Vienna Science, Research and Technology Fund initiated an exchange of ideas with political decision-makers and the former head of the urban development and planning department of the city. The mayor at that time Michael Häupl (social democratic party - SPÖ) introduced the smart city concept into coalition negotiations for the city government with the Green Party (in office 2010-2020), and included the smart city terminology in various inaugural speeches of high-ranking city officials in 2010. The transformation of Vienna into a smart city in 2011 was formalized through the legally binding enactment of the first Smart City Framework Strategy in 2014 by the city council, backed by a municipal steering committee and a scientific advisory board (among others with the Austrian Institute of Technology). A dedicated communication and consultation agency "TINA Vienna" was established, which later merged with europaform wien, and is now known as the think tank Urban Innovation Vienna. By now, policy orientation is shifting its arguments as a reaction to increasing criticism towards smart city developments. In this context, the transformation towards urban

planning for and with digital infrastructures is especially interesting to understand the underlying power dynamics by studying discourses, agents and institutions for changing and stabilizing current developments.

A *discursive shift* can be observed within strategic planning in Vienna in recent years (see Table 2). Technology is seen as “a key driver of the current transformation of city and society” (Magistrat der Stadt Wien, 2019, p. 79), pointing towards a more comprehensive understanding of technology and digitization and their overall repercussions on societal and urban structures. Particularly the Digital Agenda pushes the strategic objective to tackle the digitization of all areas of life, which represents a comprehensive challenge for society as a whole (Stadt Wien, 2019a, p. 5). Although the shared faith in technology as a determining factor for future urban development still drives arguments of effectiveness and efficiency in the smart city direction, the values increasingly shift towards more cooperation, especially with public utilities and within internal administrative processes (Stadt Wien, 2019b, p. 6). The new concept of Digital Humanism is introduced to anchor digital developments in a human-centered approach. The concept is based on an initiative that started with a transdisciplinary workshop in April 2019 in Vienna with participants from academia, government, industry, and civil society to discuss the co-evolution of information technology and humankind and the associated technical, political, economic, societal, and legal issues, resulting in the Vienna Manifesto on Digital Humanism (Werthner, 2022). The main objective of Digital Humanism is to rethink our current digital practices, emphasizing that humans should be at the center of the digital world and striving for technological progress for the sake of improving human freedom, peace, and progress in harmony with nature instead of focusing solely on economic growth (ibid.). The concept is newly emerging, thus still in the process of theory building. The goal is to encourage human-centered innovation instead of just curbing the downsides of information and communication technologies. Thus, it relates to platform municipalist strategies insofar as both notions promote a proactive involvement and engagement with technology and platforms respectively to foster democracy, inclusion, freedom, human rights and shared responsibilities for both the benefits and possible downsides of technology.

The recent introduction of the notion of Digital Humanism emphasizes that technological development should be human-centered with human decision-making processes (Werthner, 2022), pointing to a shift towards platform municipalist ideas, where platforms are embraced as a new spatial imaginary and political tool for democratic decision-making. However, in Vienna’s strategic planning discourse the notion of Digital Humanism is always used in reference to promoting digitization as a unique selling feature of Vienna by making the city into the European digitalization capital (Magistrat der Stadt Wien, 2019, p. 34; Stadt Wien, 2019c, p. 1), but failing to specify concrete measures of a socially inclusive digital transformation. Instead, Vienna is referred to as a “laboratory of modernity” for

“Human-centered Solutions” (Stadt Wien, 2019c, p. 2) to promote specific areas of strengths of the city (Stadt Wien 2019c, p. 17). Thus, focusing on international city competition to boost digitization as a unique selling feature of the city relates more closely to the smart urbanism notion where the implementation of technology in urban planning agendas is justified with competition arguments. This argumentation risks the notion of Digital Humanism becoming an empty signifier filling its meaning with the objective to create a competitive edge for infrastructure operators and industry in the areas of technology and systems integration (Charnock et al., 2021; Schremmer, 2016). Critics argue that topics such as data protection, privacy and freedom are still not sufficiently highlighted in the strategic planning discourse, not to mention the actual implementation (Ritt, 2016).

Table 2: Discursive shifts in strategic planning in Vienna (Source: own conception based on Lutz, 2019; Magistrat der Stadt Wien, 2019; Stadt Wien, 2019a, 2019b, 2019c)

	Smart Urbanism	Platform Urbanism	Platform Municipalism
<i>Philosophies /Values/ Worldviews</i>	<ul style="list-style-type: none"> • Future urban development determined by digitization • Efficiency and effectiveness 	<ul style="list-style-type: none"> • Cooperation -> Public utilities, Weblab Urban development • European Capital of Digitization 	<ul style="list-style-type: none"> • Digital Humanism • Digitization in harmony with social and democratic values
<i>Program/ Defined Issues</i>	<ul style="list-style-type: none"> • Austerity, multi-level governance issues • Competition with existing ICT and platforms • Technological leaps 		<ul style="list-style-type: none"> • Data as a city treasure • Political change as problem of continuity vs. innovative potential
<i>Policy Solutions</i>	<ul style="list-style-type: none"> • Smart City Strategy (2014/2019) • Planning as management task • Open Data Vienna (2011) 	<ul style="list-style-type: none"> • Digital Agenda (2014/2019) -> Viennese digitization 	<ul style="list-style-type: none"> • Data Excellence Strategy • OSS since 1989 • Participatory budgeting

On the *programmatic level*, austerity and tight public budgets are identified as pressing issues, but also challenges of multi-level governance (Lutz, 2019, p. 8-9; Magistrat der Stadt Wien, 2019, p. 140; Stadt Wien, 2019a, p. 13). Despite cuts in welfare, the city administration is still expected to deliver innovative solutions and compete with existing ICT and platforms. Thus, technical know-how is identified as a major concern, particularly in light of the fast pace of changing technology. Technology in general is mostly seen as a tool to cope with the big challenges of our time (e.g. climate crisis, urbanization and subsequent adaptation needs of infrastructure and public services, efficiency through conserving resources, new communication patterns, business models and forms of work). Such a view disregards firstly the inherent structural dynamics of technology itself and secondly the conflicting effects of deploying technology particularly in a sustainability context (e.g. increase in resource consumption from digital networks to application usage, see also Lange and Santarius, 2018).

However, the concern over data is shifting towards recognizing it as a “city treasure” and “a central value of an open administration of the future” (Stadt Wien, 2019b, p. 14), pointing to a changing understanding of retooling the state from the inside through fostering awareness of data security, accessibility and utilization.

On the *policy level*, the smart city framework strategy still drives the discourse towards urban planning as a management task, focusing specifically on sustainability transitions, using technology as a tool to achieve strategic goals. Since 2019, there is an increasing number of city-wide strategic plans concerned with the development of digital technologies (e.g. Digital Agenda 2019, Data Excellence Strategy 2019, AI-Strategy 2019), focusing on the notion of Digital Humanism as a guiding principle. However, this new narrative is just beginning to appear and until now fails to assign specific responsibilities or actions.

Around the same time as the discourse started to change towards the Digital Humanism notion, the *agency structure* also began to shift (Figure 1). In 2018, a new municipal department was established, the operational IT unit MA01 “Vienna digital”, merging three former IT landscapes and subordinating them to the strategic IT unit, the Magistrate’s Directorate. The administrative structure was thus changed to strategically and operationally react to increasing challenges of digitization. Since 2020 and the electoral change in government, the operational IT unit MA01 is now under the same political department as the urban development and planning unit MA18, raising hopes within the administration that this proximity will strengthen cooperation. Moreover, the WebLab Urban Development, established in the early 2000s as an overarching working group within public administration to observe social and technical developments and to foster early collaboration within public administration and enable experimental spaces, adds an active participant to a more cooperative and intersectoral environment. However, their contribution to the platform landscape of the city is still unclear. In addition to public administration, public utility companies are important actors in developing platforms. However, the cooperation between public utilities and city administration is limited to the strategic development, whereas on the implementation level of platforms, public utilities for the most part cooperate with start-ups (e.g. the development of the city-wide mobility platform Wien Mobil in cooperation with the Start-Up UpStream).

The shift towards collaboration in an inter- and transdisciplinary setting and shared responsibility for the benefits and downsides of technological development promoted by Digital Humanism relates more closely to collaboration and partnership efforts by platform urbanism and even more so by platform municipalism, linking to politics of proximity and feminization of politics through new ways of political engagement and support of values of equality, freedom and progress through cooperation instead of competition. The initial development of the Smart City strategy was strongly focused on involving technical and administrative actors only, while little attention was paid to social and political actors. On the

policy formulation level, it was thus not about discussing and negotiating different value propositions but fulfilling a strategic goal laid out by funding opportunities. However, recent documents, such as the Digital Agenda indicate a rethinking of hierarchical forms of governance as the sole mode of coordination to move towards partnership arrangements with private and scientific actors to strengthen horizontal and vertical governance (e.g. through the platform for energy and climate protection (Smart Region) in cooperation with federal states of Vienna, Lower Austria and Burgenland) (Gallian, 2020). Also, the new administrative unit MA01 created in 2018 under the direct leadership of the magistrate's directorate as the strategic IT unit points to efforts not only within vertical governance from strategic to operational management of the city, but also for horizontal governance as the operational IT unit was created for the purpose of collaborating with all municipal units and different sectors relating to digital infrastructures. Although this points to promising developments, critics argue that cooperation between administrative units is still considered insufficient and silo structures in the political-administrative body still hinder collaboration. From the early days of the smart city strategic development until recent developments of the Digital Agenda, fragmented strategic considerations and implementation projects are considered important hindering factors for a wider socio-technical transformation (Ritt, 2016).

Agents

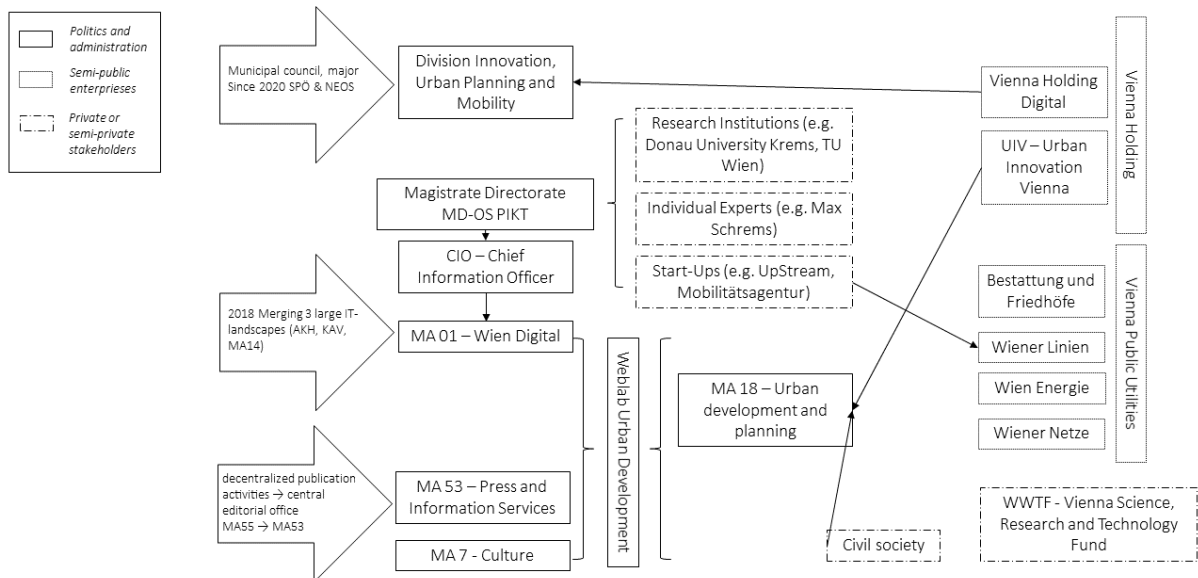


Figure 1: Agents involved in the institutionalization of digital platforms in Vienna (Source: own conception)

The public platforms developed as *collective actions* from this changed institutional setting are diverse across urban planning agendas with different purposes and modes of operation (see Table 3). Most platforms are developed to either digitize existing infrastructure systems or to digitize public services. These platforms are rather elaborate and provide a wide

range of services (e.g. mobility services, participation platforms, digital building submissions). For the most part, they are already well established and stable platforms by now, making existing city services more efficient and positioning Vienna in the international city competition as the “European Capital of Digitalization”. New platforms for urban planning are on the other hand still rather scarce and mostly temporary experiments or research projects implemented for a fixed period of time (e.g. Smart data platforms, assisted living platform). Platforms are rarely developed as new digital infrastructures to foster economic and political strategies for democratizing decision making and hardly ever realized as public-common partnerships. The only exception is the implementation of a participatory budgeting platform for the 5th district in Vienna.

Table 3: A typology of public platforms in Vienna (Source: own conception based on Lutz, 2019; Magistrat der Stadt Wien, 2019; Stadt Wien, 2019a, 2019b, 2019c)

	Platformization of existing infrastructure systems	Platformization of public services	New platforms as digital infrastructures for urban planning
<i>Objectives</i>	Conserve resources, support decision-making processes, manage city in real time	Improving city services, barrier-free access to services and information	Strengthen participation, co-design
<i>Ideological foundation</i>	Infrastructure as a prerequisite for international city competition -> transforming Vienna into the “European Capital of Digitalization”	City of short distances, open and participatory city, basis for the city’s ability to act and conduct business	Nervous system of the intelligent city, digital entrepreneurship for Smart City applications, experimentation for practice-based urban development
<i>Collective Action</i>	Instruments and applications (e.g. sensors, traffic control, intelligent energy networks)	“City as a service” (e.g. open government data, digital platforms, communication channels)	“Urban digital labs” (e.g. pilot studies)
<i>Examples</i>	Digital grave, WienMobil, Wien Geschichte Wiki, Industry 4.0, Participation platform, digital sewer network	Digital City Map, WienBot/CoronaBot, Virtual Office, Sag’s Wien App, BRISE, Open Data	Mobile Mapping, Urban/Smart data platforms, Digital Twin, Kulturtoken, WAALTeR, Homecare App

To illustrate the development of public platforms in Vienna, three examples provide short insights into each type of public platforms. WienMobil as the city-wide mobility platform serves as an illustration for platformization of existing infrastructure systems. The platform was developed in 2015 by the mobility agency Wiener Linien in collaboration with the startup Upstream, both part of the public utilities. It incorporates the vision of mobility as a service (MaaS) and serves as a transportation hub for public transit, bike sharing, car sharing, taxi and parking. The platform follows logics of real time management of transport flows, route

planning, payment and accounting. WienMobil is distinct in its broad range of criteria available for individual route planning options. It integrates a wide selection of transportation modes, following the multi-modal logic of sustainable urban transportation. The platform reveals the discursive shift towards a platform municipalist and digital humanist strategy in multiple ways: First, using the platform does not imply data extraction for the purpose of selling data to third parties. Data ownership is organized within the public utility company and users can choose how their data is being used, thus contributing to user privacy and freedom. Second, the platform provides an alternative to big platform players, such as Google by making its own mapping services available without being obligated to link their map to Google Maps, thus contributing to freedom from platform capitalist strategies. Third, the platform was developed in a public-public collaboration and uses “the municipal” as a strategic entry point for city-wide mobility by tapping into the locally specific knowledge of Wiener Linien as the anchor institution in Vienna.

“Sag’s Wien App” serves as an illustration for the platformization of public services, as the platforms’ objective is to provide the city as a service. It was developed as part of the Digital Agenda Vienna together with Viennese citizens. The platform provides the opportunity to report a concern, a dangerous spot or a malfunction to the city administration via smartphone at any time while on the move (Stadt Wien, 2017). Although according to official sites, the platform was developed in collaboration with engaged citizens, there is no evidence of the nature and extent of civic participation. According to interviews with public officials, market actors were actively involved in the development of the platform, while citizens were only invited to comment, thus failing to implement actual co-creation or public-common partnerships and catering more to visions of an efficient flow of urban life following smart and platform urbanist logics.

To illustrate the development of new platforms as digital infrastructures for urban planning, the urban data platform “Smarter Together” serves as an example. The project piloted technical and social innovations in established urban neighborhoods to promote sustainable renewal within the existing urban fabric from 2016 to 2021. The platforms’ objective was to integrate existing data networks into citizen-oriented, open data platforms (e.g. data for renovation in housing, energy-efficient buildings, multimodal mobility solutions) and emphasizing human-centered developments within technological implementations (Smart City Wien, 2018). However, the implementation of the urban data platform was only added later in the process as an additional requirement of the European Commission’s Horizon 2020 funding program. The data platform was thus realized in a short time as an open source platform, which underlines the power of the funding body to dynamically change the course of locally specific projects, highlighting challenges of multi-level governance (Gallian, 2020). Still, the project reveals platform municipalist and digital humanist strategies as the initiative builds on comprehensive participation of residents in local developments, thus

bridging an implementation-oriented to a sustainable and process-oriented approach on different levels of governance. It reflects the holistically shaped smart city approach of Vienna by emphasizing the human-centered development, where technologies are understood as part of the solution to locally specific challenges (Smarter Together, 2021). Decision-making was mainly driven by municipal stakeholders, strengthened by the Austrian social partnership and often in favor of the respective companies involved (e.g. Siemens as an important project partner). With increasing climate pressure, economic interests in the energy sector in particular have an even greater sphere of influence (e.g. increasing energy efficiency, electromobility). However, the "Smarter Together" project shows that the technologically driven core of the smart city idea is increasingly being broken down and expanded by people-centered aspects, integrative urban development and considerations in line with changing governance structures and mechanisms (Gallian, 2020). Due to a lack of funding, it was implemented only as a temporary experimental research project and did not experience long-term institutionalization.

Looking at the discursive interactions between different agents leading to platforms as collective actions, four governance lock-in mechanisms can be identified:

1. *Technological lock-ins* often lead to lengthy periods of implementing new technologies, making it harder to break away from established technologies or planning tools. This dynamic is reinforced by the related personnel and their ideological foundation of functionalist planning models and according use of digital tools from the 1970s and 1980s. At the same time, these technological lock-ins are broken down very quickly due to external shocks, such as the Covid-19 pandemic, where digital tools and platforms had to be adapted rapidly to cope with changing communication requirements.
2. *Organizational lock-ins* result from a lack of technical know-how, high dependence on a few key actors or financial constraints.
3. *Political barriers* become evident through the process of opinion leadership and interpretative sovereignty currently being fought out between different groups and think tanks. However, this competition between interest groups is anchored through the tendency for technocratic solutions more catered to the smart city notion. The often-emphasized strong local state in Vienna through "stable values", "comprehensive municipal political responsibility" and "long-term, forward-looking infrastructure planning" (Magistrat der Stadt Wien, 2019, p. 32) leads to the city acting as the main bearer of responsibility, enabling experimental spaces for new forms of infrastructure planning mostly in well-established forms of collaboration (e.g. Smart city solutions through PPP-models). Services of general interest are being renegotiated as "digitization is defined as a new challenge for public services of general interest, which are traditionally strongly anchored in Vienna" (Stadt Wien, 2019a, p. 13-14).

4. *Institutional lock-ins* result from a lack of horizontal collaboration (between different interest groups and different administrative levels) and vertical collaboration (between different sectors concerned). Coordination efforts are mostly made on the strategic discursive level (e.g. the notion of Digital Humanism is discussed broadly with different ideological origins), whereas implementing platforms follows mostly a rather technocratic approach.

Discussion & Conclusion

This article provides an overview of the genesis of technology-focused planning ideas and their implementation and development of public platforms in Vienna. It contributes to the theoretical debate on discursive institutionalism and applies it to the local case of platform development and digital urbanism in Vienna. Thus, it fills a research gap on the empirical application of the theoretical concept of discursive institutionalism on locally specific developments. Moreover, the empirical analysis of public platforms in Vienna enriches the debates on smart and platform urbanism, adding insights into the specific mechanisms of platform governance in cities.

The discursive shift in Vienna's strategic planning and change in agency through the restructuring of administrative bodies indicate the growing importance of digitization, data and platforms for urban planning agendas. On the strategic level, the city has recognized its power and responsibility in designing and developing its own digital infrastructure from a more human-centered perspective particularly through integrating the concept of Digital Humanism. The discourse on the deepest level of planning ideas, philosophies, is shifting towards a municipalist notion of digital and platform development. Also, the shift in agency and the establishment of coordinating strategic and operational actors within public administration as well as the increasing importance of public utilities as intersectoral agents in the field points to an increasing awareness of the public responsibility and opportunity to shape digital infrastructures in Vienna.

However, the programmatic and policy levels are still more catered to the smart and platform urbanism logic, where city government and administration act as enablers and facilitators for smart city solutions with a rather technocratic approach to digital and platform development. Although there are examples of public platforms in some aspects implementing a municipalist and digital humanist approach, the majority of public platforms still predominantly serves industry and private company interests representing an established smart city model. There is also a wide gap between the strategic discursive orientation, currently shifting towards a more human-centered approach and actual implementation, which often follows on from functionalist planning models of the 1980s, processing data for real-time management of the city without critically reflecting on wider implications for urban development and often lacking awareness of the overall societal impacts of technologies and

platforms. On the policy level, the conflicting image of technology as a tool and digitization as a comprehensive policy field is ubiquitous.

In general, services of general interest are being renegotiated in Vienna in response to the digitization and platformization of infrastructures and services. Digital infrastructures and platforms are increasingly recognized as part of the city's responsibility for shaping the digital transformation. The city's perception of its own scope for action is strongly anchored in social-democratic values, which is why it largely takes responsibility for infrastructure development and thus digital development. However, it remains to be seen whether Digital Humanism as a concept will lead to securing a lasting transformation and ideological shift towards human-centered digital development at various levels by opening up the technocratic approach. The discursive and agency shifts point to an institutional change that places digital transformation more strongly than before under the responsibility of the public sector and urban planning. However, this strong public responsibility hinders, to some extent, the opening of governance processes to more progressive forms of co-creation and public-common partnerships. Reflecting on the notion of dual power, the approach of transforming policy from within is already well under way in Vienna, represented by discursive and agency shifts within public administration. Transformation from without could also be more widely recognized as a fruitful enrichment to formal urban governance. The recent development of platforms such as urban data platforms with a human-centered approach bodes well for future initiatives focused on a human-centered digital transformation. More initiatives are needed, though, that take the concept of Digital Humanism seriously and incorporate values such as democracy, freedom and privacy into the active development of digital services and focus on public-common partnerships, e.g. through participatory budgets to establish democratic digital platform governance. If the concept of Digital Humanism is taken seriously, future endeavors of public platform development could offer hopeful prospects if opened up to inclusively shaping digital urbanism in Vienna along the lines of platform municipalist ideas.

In conclusion, the increasing platformization of cities, infrastructures, public services and urban planning has led to the beginning of an infrastructural reform through urban platforms also in Vienna, although the still scattered implementation hinders a comprehensive transformation towards human-centered digital and platform development on various levels. Although the concept of Digital Humanism provides hopeful insights into future prospects of platform development in line with municipalist ideas, careful monitoring of further developments is imperative to avoid a relapse into established neoliberal logics of the smart city.

References

- Anand, N., Gupta, A. & Appel, H. (2018). *The Promise of Infrastructure*. Duke University Press.
- Anttiroiko, A. (2021). Digital Urban Planning Platforms : The Interplay of Digital and Local Embeddedness in Urban Planning. *International Journal of E-Planning Research*, 10(3), 35–49. <http://doi.org/10.4018/IJEPR.20210701.0a3>
- Arts, B. & van Tatenhove, J. (2004). Policy and power: A conceptual framework between the 'old' and 'new' policy idioms. *Policy Sciences*, 37(3-4), 339–356. <https://doi.org/10.1007/s11077-005-0156-9>
- Artyushina, A. (2020). Is civic data governance the key to democratic smart cities? The role of the urban data trust in Sidewalk Toronto. *Telematics and Informatics*, 55 (2020) 101456. <https://doi.org/10.1016/j.tele.2020.101456>
- Barlösius, E. (2019). *Infrastrukturen als soziale Ordnungsdienste. Ein Beitrag zur Gesellschaftsdiagnose*. Campus Verlag.
- Barns, S. (2020). *Platform urbanism. Negotiating platform ecosystems in connected cities*. Palgrave Macmillan.
- Barns, S., Cosgrave, E., Acuto, M. & McNeill, D. (2016). Digital Infrastructures and Urban Governance. *Urban Policy and Research*, 35(1), 20–31. <https://doi.org/10.1080/08111146.2016.1235032>
- Batty, M. (2013). Big data, smart cities and city planning. *Dialogues in Human Geography*, 3(3), 274–279. <https://doi.org/10.1177/2043820613513390>
- Bauriedl, S. & Strüver, A. (2017). Smarte Städte. Digitalisierte urbane Infrastrukturen und ihre Subjekte als Themenfeld kritischer Stadtforschung. *sub\urban. zeitschrift für kritische stadtforschung*, 5(1/2), 87–104.
- Bauriedl, S. & Strüver, A. (2020). Platform Urbanism: Technocapitalist Production of Private and Public Spaces. *Urban Planning*, 5(4), 267–276. <https://doi.org/10.17645/up.v5i4.3414>
- Caprotti, F. (2019). Spaces of visibility in the smart city: Flagship urban spaces and the smart urban imaginary. *Urban Studies*. 56(12), 2465–2479. <https://doi.org/10.1177/0042098018798597>
- Caprotti, F. & Cowley, R. (2019). Varieties of smart urbanism in the UK: Discursive logics, the state and local urban context. *Transactions of the Institute of British Geographers*, 44(3), 587–601. <https://doi.org/10.1111/tran.12284>
- Charnock, G., March, H. & Ribera-Fumaz, R. (2021). From smart to rebel city? Worlding, provincialising and the Barcelona Model. *Urban Studies*, 58(3), 581–600. <https://doi.org/10.1177/0042098019872119>
- Chiappini, L. (2020). The Urban Digital Platform: Instances from Milan and Amsterdam. *Urban Planning*, 5(4), 277–288. <https://doi.org/10.17645/up.v5i4.3417>
- Davoudi, S. (2018). Discursive Institutionalism and Planning Ideas. In: W. Salet (Ed.): *The Routledge Handbook of Institutions and Planning in Action*, pp. 61–73. Routledge.
- Douay, N. (2018). *Urban Planning in the Digital Age*. John Wiley & Sons, Inc.
- Dunn, W. (2012). *Public policy analysis. An introduction*. Pearson.
- Fairclough, N. (2013). *Critical discourse analysis. The critical study of language*. Routledge.
- Frank, S. & Krajewsky, G. (2018). Smarter Urbanismus und Urbanität. In: S. Bauriedl & A. Strüver (Eds.): *Smart City. Kritische Perspektiven auf die Digitalisierung in Städten*, p. 63-74. Transcript.

- Gallian, L. (2020). *Zur Governance von Wiener Smart City-Projekten. Eine institutionalistische und akteurszentrierte Betrachtung*. Wien.
- Gillespie, T. (2018). *Custodians of the Internet. Platforms, Content Moderation, and the Hidden Decisions That Shape Social Media*. Yale University Press.
- Graham, S. & Marvin, S. (2001). *Splintering urbanism. Networked infrastructures, technological mobilities and the urban condition*. Routledge.
- Hamedinger, A. (2008). Strategieorientierte Planung in Wien. In: A. Hamedinger, O. Frey, J. Dangschat & A. Breiffuss (Eds.): *Strategieorientierte Planung im kooperativen Staat*. VS Verlag für Sozialwissenschaften, pp. 151–177.
- Hamedinger, A., Plank, L. & Novy, A. (2019). Editorial: "Wien für alle" - Perspektiven zukunftsfähiger Stadtpolitik. *Kurswechsel: Zeitschrift für gesellschafts-, wirtschafts- und umweltpolitische Alternativen* (4).
- Hollands, R. (2015). Critical interventions into the corporate smart city. *Cambridge Journal of Regions, Economy and Society*, 8(1), 61–77. <https://doi.org/10.1093/cjres/rsu011>
- Jameson, F. & Žižek, S. (Ed.) (2016). *An American utopia. Dual power and the universal army*. Verso.
- Keller, R. (2011). The Sociology of Knowledge Approach to Discourse (SKAD). *Human Studies*, 34(1), 43–65. <https://doi.org/10.1007/s10746-011-9175-z>
- Krisch, A. & Plank, L. (2018). Internet-Plattformen als Infrastrukturen des digitalen Zeitalters. Studie im Auftrag der Kammer für Arbeiter und Angestellte Wien. Self-published.
- Krisch, A. & Plank, L. (2019). Internet Platforms as Infrastructures of the Digital Age. *Der öffentliche Sektor – The Public Sector*, 45(1), 13-16.
- Krisch, A. & Suitner, J. (2020). Aspern Explained: How the Discursive Institutionalisation of Infrastructure Planning Shaped North-Eastern Vienna's Urban Transformation. *disP - The Planning Review*, 56(2), 51–66. <https://doi.org/10.1080/02513625.2020.1794126>
- Lange, S. & Santarius, T. (2018). *Smarte grüne Welt? Digitalisierung zwischen Überwachung, Konsum und Nachhaltigkeit*. oekom verlag.
- León, L. & Rosen, J. (2020). Technology as Ideology in Urban Governance. *Annals of the American Association of Geographers*, 110(2), 497–506. <https://doi.org/10.1080/24694452.2019.1660139>
- Leszczynski, A. (2016). Speculative futures: Cities, data, and governance beyond smart urbanism. *Environment and Planning A: Economy and Space*, 48(9), 1691–1708. <https://doi.org/10.1177/0308518X16651445>
- Luque-Ayala, A. & Marvin, S. (2016). The maintenance of urban circulation: An operational logic of infrastructural control. *Environment and Planning D: Society and Space*, 34(2), 191–208. <https://doi.org/10.1177/0263775815611422>
- Lutz, B. (2019). [DE] Data Excellence. IKT-Teilstrategie. Wien.
- Magistrat der Stadt Wien (2019). [SCWR] Smart City Wien Rahmenstrategie 2019-2050. Wien.
- Marshall, T. (2013). *Planning major infrastructure. A critical analysis*. Routledge.
- Matern, A. (2017). Smart City-Konzepte als Impuls zur Erneuerung städtischer Infrastrukturen? In: J. Engels, N. Janich, J. Monstadt & D. Schott (Eds.): *Nachhaltige Stadtentwicklung. Infrastrukturen, Akteure, Diskurse*. Campus Verlag, pp. 150–173.
- McQuire, S. (2021). Urban Digital Infrastructure, Smart Cityism, and Communication. *International Journal of E-Planning Research*, 10(3), 1–18. <https://doi.org/10.4018/IJEPR.20210701.oa1>

- Meuser, M. & Nagel, U. (2009). Das Experteninterview – konzeptionelle Grundlagen und methodische Anlage. In: S. Pickel, G. Pickel, H-J. Lauth & D. Jahn (Eds.): *Methoden der vergleichenden Politik- und Sozialwissenschaft. Neue Entwicklungen und Anwendungen*. VS Verlag für Sozialwissenschaften, pp. 465–479.
- Micheli, M., Ponti, M., Craglia, M. & Berti Suman, A. (2020). Emerging models of data governance in the age of datafication. *Big Data & Society*, July 2020. <https://doi.org/10.1177/2053951720948087>
- Mora, L., Deakin, M. & Reid, A. (2019). Strategic principles for smart city development: A multiple case study analysis of European best practices. *Technological Forecasting and Social Change*, 142, 70–97. <https://doi.org/10.4018/IJEPR.20210701.0a1>
- Morozov, E. (2019). *Digital Socialism?* <https://newleftreview.org/issues/II116/articles/evgeny-morozov-digital-socialism>, 22.9.2020.
- Morozov, E. & Bria, F. (2017). Die smarte Stadt neu denken. Rosa Luxemburg Stiftung.
- Moulaert, F., Jessop, B. & Mehmood, A. (2016). Agency, structure, institutions, discourse (ASID) in urban and regional development. *International Journal of Urban Sciences*, 20(2), 167–187. <https://doi.org/10.1080/12265934.2016.1182054>
- Nash, V., Bright, J., Margetts, H. & Lehdonvirta, V. (2017). Public Policy in the Platform Society. *Policy & Internet*, 9(4), 368–373. <https://doi.org/10.1002/poi3.165>
- Ritt, T. (2016). Smart City - Zukunftskonzept oder Marketing mit Nebenwirkungen? Smart City - Zukunftskonzept oder Marketing mit Nebenwirkungen? In: K. Hammer (Ed.), *Wien wächst - Smart City. Neues Konzept, offene Fragen*. Kammer für Arbeiter und Angestellte für Wien, pp. 5–19.
- Rose, G. (2019). Smart urban: imaginary, interiority, intelligence. In: C. Lindner & M. Meissner (Eds.), *The Routledge companion to urban imaginaries*. Routledge, pp. 105–112.
- Russell, B. (2019). Beyond the Local Trap: New Municipalism and the Rise of the Fearless Cities. *Antipode*, 51(3), 989–1010. <https://doi.org/10.1111/anti.12520>
- Sadowski, J. & Pasquale, F. (2015). Smart City. Überwachung und Kontrolle in der "intelligenten Stadt". Rosa Luxemburg Stiftung.
- Salet, W. (2018). Institutions In Action. In: W. Salet (Ed.): *The Routledge Handbook of Institutions and Planning in Action*, pp. 3–23. Routledge.
- Schleicher, K. (2021). *Von alternativen Paradigmen zur umfassenden Transformation. Analyse transformativer Forschungsprojekte anhand des diskursiven Institutionalismus*. VS Verlag für Sozialwissenschaften.
- Schmidt, V. (2008). Discursive Institutionalism: The Explanatory Power of Ideas and Discourse. *Annual Review of Political Science*, 11 (1), 303–326. <https://doi.org/10.1146/annurev.polisci.11.060606.135342>
- Schremmer, C. (2016). Wie arbeitet Wien zukünftig? Smart City, Wirtschaft und Standortpolitik für Wien. In: K. Hammer (Ed.), *Wien wächst - Smart City. Neues Konzept, offene Fragen*. Kammer für Arbeiter und Angestellte für Wien, 64.
- Smart City Wien (2018). *Smarter Together - Smart City Wien*. <https://smartcity.wien.gv.at/en/smarter-together-2/>, 14.3.2022.
- Smarter Together (2021). *Datenplattformen im Forschungsfokus - Smarter Together*. <https://www.smartertogether.at/datenplattformen-im-forschungsfokus/>, 14.3.2022.
- Söderström, O., Paasche, T. & Klauser, F. (2014). Smart cities as corporate storytelling. *City*, 18(3), 307–320. <https://doi.org/10.1080/13604813.2014.906716>

- Sorensen, A. (2014). Taking path dependence seriously: an historical institutionalist research agenda in planning history. *Planning Perspectives*, 30(1), 17–38. <https://doi.org/10.1080/02665433.2013.874299>
- Stadt Wien (2017). *Sag's Wien - Die App für Ihre Anliegen an die Stadt*. <https://www.wien.gv.at/sagswien/#neu>, 14.3.2022.
- Stadt Wien (2019a). [DA] *Digitale Agenda Wien 2025. Wien wird Digitalisierungshauptstadt*. Wien.
- Stadt Wien (2019b). [KI] *Künstliche Intelligenz Strategie. Digitale Agenda Wien*. Wien.
- Stadt Wien (2019c). [WI] *Wien 2030. Wirtschaft & Innovation*. Wien.
- Thompson, M. (2020). What's so new about New Municipalism? *Progress in Human Geography*, 15(1), 317-342. <https://doi.org/10.1177/0309132520909480>
- Tomaney, J., O'Brien, P. & Pike, A. (2018). Planning for Infrastructure. In: J. Ferm & J. Tomaney (Eds.): *Planning Practice: Critical perspectives from the UK*, pp. 220-234. Routledge.
- Valverde, M. & Flynn, A. (Eds.) (2020). *Smart Cities in Canada. Digital Dreams, Corporate Designs*. James Lorimer & Company Ltd., Publishers.
- Vollmer, L. (2017). Keine Angst vor Alternativen. Ein neuer Munizipalismus. über den Kongress „FearlessCities“, Barcelona 10./11. Juni 2017. *sub\urban. zeitschrift für kritische stadtforschung*, 5(3), 147–156. <https://doi.org/10.36900/suburban.v5i3.305>
- Werthner, H. (2022). Preface. In: H. Werthner, E. Prem, E. Lee & C. Ghezzi (Eds.). *Perspectives on Digital Humanism*. Springer International Publishing, pp. v–ix.
- White, J. (2016). Anticipatory logics of the smart city's global imaginary. *Urban Geography*, 37(4), 572–589. <https://doi.org/10.1080/02723638.2016.1139879>