CONDITIONS OF PLATFORMIZATION OF URBAN LIFE

Platforms Becoming Infrastructural?
Mapping Socio-Spatial Transformations

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Introduction

Recent debates around *platform urbanism* point towards the complex entanglements of digital technology and urban space and consider how emerging socio-technical formations shape platform-mediated urban everyday life. In this light, platforms are often qualified as a new form of urban infrastructure and it is argued that they "have become agents not only of socio-technical transformation but also of legal and infrastructural change" (Mooshammer/Mörtenböck 2021: 12).

Our article critically reviews existing research around platform urbanism (Sadowski 2020; Bauriedl/Strüver 2020) and discusses how the infrastructural character of platforms is analyzed. We sketch out a framework to understand how an *infrastructuralization of platforms* takes place vis-à-vis ongoing socio-spatial transformations akin to *austerity urbanism* (Peck 2012).

The first part of the article reviews two different strands of infrastructure research: on the one hand, insights from Science and Technology Studies (STS) that highlight the co-constitution of technological and social structures and on the other hand, feminist political theory that theorizes *infrastructures for social reproduction*. The second part takes a closer look at literature theorizing platform urbanism and systematizes the different understandings of infrastructure guiding the analysis of platforms' operations in urban space. The third part discusses two case studies – Airbnb and care platforms that we have studied in depth elsewhere (see Berfelde 2021; Kluzik 2021). We look at these two cases to understand how platforms leverage a *crisis of care* to position their business model as a privatized infrastructure for social reproduction. What we propose is a rethinking of technopolitical theorizations with a feminist focus that understands the social-reproductive contradictions inherent

to financialized capitalism as a central prism for a more nuanced analysis of the increasing infrastructuralization of platforms.

Infrastructures for a livable life? Multiple perspectives and frictions

What are we (not) talking about when analyzing infrastructure? In the past decade, one was able to witness a growing interest in the social study of infrastructure across various disciplines and fields of research. Initially rooted in Science and Technology Studies (STS), the study of infrastructure points towards the co-constitution of technological and social structures. In this first section of our article, we review different notions of infrastructure in order to work on a more general understanding of what infrastructure *is* and *does*. Furthermore, we propose a rethinking of established technopolitical theorizations vis-à-vis feminist literature to then develop a definition of infrastructures of social reproduction.

The concept of infrastructure is rooted in the Enlightenment idea of unlimited circulation of goods, people, and ideas (Mattelart 1996) and therefore inextricably linked to the idea of technological governance to secure freedom in liberal societies. In her seminal research, Susan Leigh Star (1999) most notably brought infrastructure to the forefront of the study of social relations and large technical systems. Infrastructure, in general terms, is defined by eight dimensions: through its embeddedness, transparency, reach or scope, part of membership, link with conventions of practice, embodiment of standards, it is built on an installed base and becomes visible upon breakdown (Star/Ruhleder 1996: 113).

Brian Larkin defines infrastructure as "built networks that facilitate the flow of goods, people, or ideas and allow for their exchange over space". Infrastructures "comprise the architecture for circulation, literally providing the undergirding of modern societies, and they generate the ambient environment of everyday life" (Larkin 2013: 328). The focus on the network-like character is a key feature that complements the dimensions discussed in relation to Star's work. Working on an ontological characterization of what infrastructure *is*, Larkin emphasizes how infrastructures are "things and also the relation between things", comprising different components such as "built things, knowledge things, or people things" (Larkin 2013: 329).

The types of infrastructural networks analyzed in the debates summarized above – such as transport, energy, water, telecommunications – are

the "material mediators between nature and the city" and therefore form "constitutive parts of the urban" (Kaika/Swyngedouw 2000: 120). The *modern infrastructural ideal*, embodied by the Keynesian welfare state up until the 1970s, understood the provision of these basic infrastructures to be a core role of the state. At that time comprehensive infrastructural provision was also a key organizing principle for urban planning. Stephen Graham and Simon Marvin consider how these "state-backed, collectivized forms of urban infrastructure provision" (Graham/Marvin 2002: 95) fell into crisis due to changing political economies of capitalist urbanization. A fiscal and legitimacy crisis lead to a critique of supposedly inefficient state-provision and consequently to the neoliberal privatization of infrastructural provision and services. Urban infrastructural networks were *unbundled*, i.e., no longer comprehensively planned by the state but packaged into individual services provided by corporate actors. *Splintering urbanism* replaced the rationally planned urban (Graham/Marvin 2002: 33) and private investment in infrastructural projects – often orchestrated through the credit-system and debt-financed expenditures – became a means to *fix* over-accumulated capital in space (Harvey 2001; 2018: xvii).

Studies of infrastructural systems often focus on the relationality between the physical and the digital, the social and the technological, the human and the non-human. Relationality is also a core concept in feminist theory, such as early ecofeminist interventions (Shiva/Mies 2014), feminist ethico-political theory (Butler 2018) as well as feminist science studies (Haraway 1988). Judith Butler's intervention in *Notes Toward a Performative Theory of Assembly* makes a compelling case for a possible re-politicization of the livability of lives against the backdrop of neoliberal precarization. As already outlined in earlier work, Butler invites us to think mutual dependency through vulnerability and precariousness. Precariousness is understood as a generalized condition of human life – a "common human vulnerability that emerges with life itself" (Butler 2006: 31). Butler argues that "everyone is dependent on social relations and enduring infrastructures in order to maintain a livable life" (Butler 2018: 21).

By drawing on Butler's theorization, we aim to develop an understanding of infrastructure as *social infrastructure* that the reproduction of lives depends upon. In times of the neoliberal restructuring and dismantling of welfare services and increasing insecurity – a *biopolitical situation* in which diverse populations are subject to precarization – she notes how "some populations are disposable" (Butler 2018: 11). As Nikki Luke and Maria Kaika remark, an "attack on historical infrastructures of social reproduction […] is not

simply a 'side effect' of gentrification, but [a] prime strategy towards urban economic restructuring". Housing privatization, the dismantling of workers' rights and welfare, the privatization of eldercare, health, educational institutions, and childcare are key to contemporary gentrifying urban politics (Luke/Kaika 2019: 579). In this way, the differential access to infrastructures for certain populations manifests whose lives and bodies are rendered disposable and whose are being cared for. Butler makes a powerful call to go beyond a neoliberal and individualizing ethics of *responsibilization* and looks for alternatives that acknowledge how lives are dependent on infrastructures.

Platform urbanism = platform infrastructuralization?

In this section we excavate how an understanding of infrastructure – as the essential background upon which everyday life unfolds and the socio-technological forces shaping, governing, and restructuring public action – structures the analysis of platform urbanism. Platforms are often considered as ubiquitous, but simultaneously urban phenomena. Jathan Sadowski, for example, in making sense of the recent urbanization of digital capitalism and the "growing presence and power of digital platform in cities", argues that platforms are centralized in cities "for many of the same reasons that capital is" (Sadowski 2020: 449-50): Platforms benefit from the population density and spatial proximity of users/workers in cities. There are more opportunities for mediating social relations and extracting economic value in large, diverse markets (Sadowski 2020: 450).

Platforms not only tap into existing urban labor markets – where precarious workers juggle multiple gigs – but they also appropriate the socially produced and collective value of urban life (Marrone/Peterlongo 2020; Rossi 2019). In the platforms' business model, the direct exploitation of human labor is combined with the exploitation of "the commonwealth of metropolitan environments (in terms of codified and socially diffused knowledge, entrepreneurial life forms, and relational abilities)" (Rossi 2019: 13).

In recent debates the concept *platform urbanism* gained traction to not only illuminate *platform capitalism* (Srnicek 2017) as an urban phenomenon, but also how platform intermediation changes urban everyday life – labor, social reproduction, interaction, consumption, and circulation. An assumed increasing infrastructuralization of platforms is often taken as the starting point to approach a conceptualization of platform urbanism (Altenried/Animento/

Bojadžijev 2021) and to think "about platforms per se as a new form of urban infrastructure" (Moore/Rodgers 2018). This part of our article takes a closer look at how critical research on platforms and the new field of platform urbanism discusses the infrastructural character of platforms. Thereby two broader strands of theorization will emerge: on the one hand the infrastructural character is associated with platforms becoming essential mediators of digitally-enabled interaction (Plantin et al. 2018; Barns 2019) and on the other hand the market-making function of platforms is interrogated by arguing that they are *digital infrastructures* connecting supply and demand for goods, services, and production (Srnicek 2017) and re-arranging existing urban operations (Richardson 2020).

Plantin et al. argue that "[d]igital technology have made possible a 'platformization' of infrastructure and an 'infrastructuralization' of platforms" (Plantin et al. 2018: 295). They come to this conclusion by looking at how Google and Facebook shaped the commercialization of the social web and argue that the two platforms have become so ubiquitous that they qualify as infrastructure. Here platforms are understood as the media environment *essential* to our daily lives. Working on the concept *platform urbanism* Sarah Barns argues that the influence of platform-mediated services "now far exceeds that of the social web" and that they increasingly influence and shape everyday socio-spatial experience (Barns 2019: 2). Barns points towards the entanglement of digital and physical infrastructure by arguing that "cities and their information infrastructure [are] now increasingly framed as dense landscapes of platform intermediation" (Barns 2019: 18). Platforms, here, are qualified as infrastructural because they are understood as the ubiquitous background upon which everyday life unfolds and the technological and social forces governing public action. As infrastructure, platforms are becoming the underlying digital condition – essential digital systems that not only make everyday life possible, but also shape and restructure public action.

In terms of materiality, the above-mentioned theorizations define infrastructure as technical systems that form the essential and underlying condition of everyday life. Agnieszka Leszczynski, for instance, argues that it is often more crucial to consider what infrastructure *does* – i.e., *infrastructural capacities* – over defining what kind of materiality infrastructure *is* (Leszczynski 2020: 192). Infrastructural capacity in Barns and also Plantin et al.'s theorization is understood to shape "mundane connectivity and interaction" (Leszczynski 2020: 190). Specifically, Barns' concept of platform urbanism considers how platforms weave themselves into and become an indispensable

part of users' everyday life via their smartphones. Barns phenomenological perspective considers how platforms shape "urban experience" and how social interaction "becomes a site of platform intermediation" (Barns 2019: 8).

The second strand of theorization considers the market-making function of platforms and thereby understands them as infrastructures for economic transactions. Nick Srnicek, for example, defines platforms as "digital infrastructures that enable two or more groups to interact" matching the supply and demand for producers and consumers (Srnicek 2017: 43). Lizzie Richardson argues that "the problems and possibilities of platforms can be better understood by examining how they manifest through urban space" (Richardson 2020: 458) and thereby goes beyond an understanding of platforms as corporate and economic actors by arguing that they primarily function through reorganizing existing urban operations "such as transport, housing, and so on" "not through new physical infrastructure, but instead through novel technologies of coordination that can reterritorialize those already existing" (Richardson 2020: 460). Through the reorganization of existing urban operations, platforms produce "a new form of collective or public infrastructure" (Richardson 2020: 460).

The publicness of this infrastructure, however, is not mediated by the state, but by the market. Considering the double movement of *infrastructuralization of platforms* and *platformization of infrastructure* together with the argument that platforms create a new form of market-mediated publicness, the latter then comes to mean that the access to infrastructure is increasingly governed by private economic actors. As we have seen, Srnicek relates the infrastructural character of platforms to their market-making function and Richardson to platforms functioning as network or relation between existing urban operations that create a new economized publicness.

Platforms as infrastructures for social reproduction – considerations from housing and care-work

If we understand platforms as a new form of urban infrastructure, what is still missing after our considerations in the previous part, is how platforms' business models interact with and are embedded within the contemporary political economy of infrastructure more broadly (Shapiro 2021: 116). We will turn to this question in this section of our article by (1) analyzing Airbnb's opera-

tions in urban space and (2) how platforms, such as Care.com and Helpling, leverage care-gaps.

In December 2019 author 1 conducted interviews with Airbnb-hosts to identify their motivation to offer their private home as a service via the platform. The interviewed hosts were all personally involved in the management of their Airbnb rental and were really sharing their home with guests, meaning often renting out a single room in the flat they were living in. All hosts cited economic motives as the main motivation for renting out a part of their home through the platform. The hosts' motivations can be divided into three categories: (1) the income generated through Airbnb is a permanent and necessary source of income; (2) renting out via Airbnb serves to bridge a temporary financial hardship; (3) renting out is a sporadic source of additional income. Only one of the interviewed hosts belonged to the third group as he only sporadically used Airbnb to generate an additional income that enables a certain lifestyle.

Hosts' stories that belong to the first and second group – thus for whom the Airbnb rental is a permanent source of income or serves to bridge a temporary financial hardship – revealed that their economic motivation was often linked to precarious forms of self-employment and limited mobility on the housing market due to rising rents. The neoliberal dismantling of social infrastructures discussed above causes both insecure employment relations and rising rents due to the contemporary housing crisis. The privatization of infrastructure due to austerity politics caused a crisis of care – a crisis experienced by subjects to reproduce their lives (daily and intergenerationally) under conditions which systematically undermine their ability to do so (Fraser 2016; 2017). Airbnb positions the platform as an individualized solution for precarization processes by inciting hosts to understand their bedroom as an asset that can function as an insurance in precarious times – this is further evidenced by the company's own marketing, for example the *Economic Empowerment Agenda* announced in 2017 (Airbnb Citizen 2017).

Complementary, digital care platforms such as Helpling and Care.com offer personalized fixes for the crisis of care. These platforms serve as matchmakers to link the supply and demand for a variety of caring activities, from cleaning services to childcare and eldercare, that are offered as a paid service. As Julia Ticona and Andrea Mateescu outline for the specific case of platform-mediated domestic work in the US, the technopolitics of platforms' matchmaking and reputation systems shape the workers' experience as *cultural entrepreneurs* (Ticona/Mateescu 2018). Platforms create the infrastructure that

allows for trading care as a commodity and thereby claim to contribute to the formalization of the care-sector that is historically shaped by informal labor relations.

Specifically, in the care sector, the neoliberal dismantling of infrastructures of social reproduction intervenes into broader patterns of the structural devaluation and invisibilization of care and reproductive labor which was discursively supported by its framing as unwaged and gendered labor of love (Federici 2012). Through the dismantling of state services, the provision of care and domestic labor is becoming ever more insecure. At the same time more and more women are getting into paid employment shouldering a double burden of wage labor and unwaged care labor (Dowling 2021). In addition, to fill in the *care gaps* in neoliberal welfare states, reproductive labor has been and is still externalized onto migrant women to perform the repair and maintenance of the care regimes in the Global North (see Lutz 2018). Domestic and reproductive labor is therefore not only gendered and classed, but also racialized. Platform capitalism tapped into existing care gaps by positioning diverse business models, such as Helpling and Care.com, as a techno-fix for care-burdened households providing flexible, just-in-time solutions for a historically invisibilized reproductive labor. Platforms act here as agents of social and individual insecurity by attempting to govern invisibility and informality. These infrastructures are constantly evolving, coexist and feed into the workings of other platform infrastructures. They lead to an expansion of economic practices and the commodification of ever more care-taking activities as a service. The entanglements of class, race, gender, and technocapitalism, as embodied in the platformization of care, actively shape socio-spatial relations and in doing so perpetuate and even exacerbate existing inequalities.

Conclusion

Throughout the article we have seen that the literature around platform urbanism associates an infrastructural character to platforms: they are understood as the underlying and essential digital condition that makes everyday interaction possible and as networks that facilitate the circulation of goods, people, and ideas. What remains under-examined in the literature is "urban infrastructures' role in the political economy of platform capitalism" – a research gap also identified by Aaron Shapiro (Shapiro 2021: 116).

Shapiro coins the concept *infrastructural surplus* to underline "the excess of value derived from collective resources embedded in the urbanized landscape" (Shapiro 2021: 103). The concept sheds light on platforms appropriating existing urban infrastructure and the socially produced value of urban life. Airbnb, for example, does not contribute to urban infrastructure, but merely appropriates the existing housing stock of a city where hosts are responsible for their own accommodation. The same mechanism operates for the multiplicity of services that digital care platforms provide. These platforms are, as Jathan Sadowski and Karen Gregory describe them, *biopolitical* – they "govern[s] human life by coordinating the performance of, and extracting the value from, its vital productive energy" (Gregory/Sadowski 2021: 2).

What we aimed to show in this article, is that platforms not only profit by appropriating existing urban infrastructure and the value embedded within, but also leverage the dismantling of social infrastructures akin to austerity urbanism and the care crisis to position their business model as a new privatized infrastructure for social reproduction. Social infrastructures such as housing and welfare provision are becoming ever more insecure – this forms the social-economic context into which platforms intervene.

Although households cannot be fully commodified, care platforms offer just-in-time solutions for care gaps, as small-scale reproductive activities are offered as a service via the platform. Airbnb's reproductive model incites hosts to capitalize on their unused bedroom and to understand it as an insurance in precarious times. As those platforms can be understood as a new form of privatized social infrastructure and to not reproduce corporate narratives, it will be crucial to always critically consider infrastructural access as well as dynamics of exclusion and inclusion from these reproductive models. Who is able to rent out a spare room via Airbnb to bridge a temporary financial hardship? And who can rely on commodified care-services when facing time pressure? How are these dynamics of exclusion-inclusion structured along classed, racialized, and gendered lines?

We conclude this article by giving a brief, and necessarily incomplete policy outlook. Airbnb's impact on local housing markets and gentrification processes has been widely recognized by critical research (Duso et al. 2020; Cocola-Gant/Gago 2019; Wachsmuth/Weisler 2018). Thus, for everyone who is excluded from its reproductive model, the platform's urban operations increase socio-spatial inequality and precarity. Airbnb's expansion in urban spaces therefore needs to be met by stricter regulation including (1) "enacting and enforcing bans on the misappropriation of housing" through hosts (2)

for which the platform needs to be forced to provide the data on short term rental-provision in cities to ensure the enforcement of regulatory law. Furthermore, (3) platforms must be held accountable to comply with local regulations, including for example deleting non-compliant listing and the payment of tourism tax and (4) a Europe wide reform is needed in order to tax platforms where they profit – "to redistribute a portion of the exorbitant profits for the common good" (Gennburg et al. 2021: 27-29).

However, as we have shown throughout this article, platforms like Airbnb, intervene into broader crisis patterns caused by the neoliberal disinvestment in welfare state provision. Therefore, to effectively tackle corporate platforms' power, demands for stricter regulation need to go hand in hand with demands for a reinvention of welfare suitable for digital economies. Ursula Huws (2019), a prominent voice in the study of digital labor and its embeddedness within the contradictions of contemporary welfare, argues that the exploitative effects of platformization need to be met by welfare policies such as investment in public services, a minimum wage that really ensures a living and a reform of employment law (Huws 2020). Taking a closer look at the commodification of social reproductive labor through platforms, Huws concludes that new feminist strategies need to address the underlying social relations perpetuating unequal divisions of labor (Huws 2019).

Lastly, at the heart of a more just platform future is also a non-discriminatory, bottom-up design of technologies that serves the needs of households and communities rather than those of extractive platform business models. Some of these futures are already materializing in present day capitalism as the emergence of *platform cooperativism* as a movement (Scholz 2016; Sandoval 2020) shows.

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