Social infrastructure: why it matters and how urban geographers might study it

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Routledge
Taylor & Francis Group

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ABSTRACT

Social infrastructure is an emerging research frontier in urban geography and urban studies. This editorial introduction provides a concise introduction to the term. It briefly sets out the intellectual provenance of the concept of social infrastructure, examining the different ways social infrastructure is being used across urban geography.

1. Introduction

This special issue is about social infrastructure. Because social infrastructures matter. Social infrastructures are places that allow people to gather. Places that support community life. Places that allow friends to spend time together, and to care for each other. Places that allow people to crowd together, experience culture together. Places that encourage people to exercise, play sport, dance. Places that allow people to live comfortably alone and alongside one another. Humans are social animals. And it is these kinds of spaces – these spaces of sociality – that make life in cities liveable and worthwhile. Humans need spaces to be social with one another. They also need spaces that allow personal repair and respite from the demands of others; spaces outside the home where they nonetheless feel at home (Anderson, 2011; Talen, 2019; Blokland, 2017). These are the kinds of spaces that make up the infrastructures of social life; the spaces and places that support social connection and sociality are a city's social infrastructure (Klinenberg, 2018; Latham & Layton, 2019). How to support the social life of cities, is a question critical to contemporary urban life. This can be phrased positively: How can cities – as immense concentrations of people from all kinds of cultural and socio-economic backgrounds – support urban environments where inhabitants have a background sense of trust in others, where they cooperate, where they form communities? Or, the question can be flipped to one of prevention: How can cities, and the neighborhoods that make them up, be set up to counter loneliness, social isolation, and poor mental health?

2. Social infrastructure and urban geography

Social infrastructures have become a key focus of urban geographical research. Urban geographers have long been interested in how neighborhoods work, the ways in which certain urban environments allow people to prosper, and of course all the ways that these opportunities are unequally distributed and accessible. In recent years the concept of social infrastructure has provided a language for talking about these important topics. That said, the term has been pulled in a diverse set of ways. Broadly speaking there are four ways the concept of social infrastructure is being put to use.

The first connects to the argument that people are infrastructure (Simone, 2004, 2021) – this attends to how the social life of many cities of the Global South hangs together, and the way it is dependent on relationships between people rather than formal physical infrastructural provisioning. Rather than focusing on the physical systems of water distribution, power provision, telecommunications and transport – the normal focus of urban infrastructural research – Simone argues that in the *absence* of formal physical infrastructures the relationships between people, and the ways that supports and sustains them, can be understood as forming a kind of infrastructure. Writing from the context of Johannesburg in the early 2000s, working with infrastructure provided Simone with a lively vocabulary to describe the way that life on the majority margins of the city functions, and how opportunities for transaction and cooperation are made possible within informal and complex spaces. The concept of "people as infrastructure" has since been extended to signify the unruly potential of collective life – that "a future for the collective can emanate from the collective itself" (Simone, 2021, p. 6). It works in recognizing the generative power of so much overlooked informal activity, and in how "bare life – is somehow redeemed" (Simone, 2004, p. 428). It is an approach to social infrastructure that is interested in how social energies and efforts can function as infrastructure in the absence of infrastructural provisioning.

The second definition of social infrastructure, a close relation of the first, focuses on the sociality that gathers around conventional hard physical infrastructures such as water, sanitation, and energy, that allows otherwise precarious technological networks to function. Here, the concept of social infrastructure refers to the intricate social work-arounds that "people put together to sustain life" in underfunded and under-supported urban environments (McFarlane & Silver, 2017, p. 458). In effect it is the social life of infrastructure; all that sociality and talk that goes into keeping infrastructures running (Graham & McFarlane, 2015). Central to this body of work are how social, cultural, and political factors can warp access to infrastructures. This research focuses on unequal relations of caste, class, religion, race and gender and the implications for how essential services in cities are distributed and accessed (Desai et al., 2014; Truelove, 2011). And it is also interested in the ways that infrastructural provisioning can become a site for protest and political action (McFarlane & Silver, 2016). This definition of social infrastructure then, is not so much interested in the infrastructures of sociality, but in the social relations of power and politics that become attached to infrastructures that are otherwise presumed to be material, uniform, rational, asocial.

Third is the area of work on social infrastructure concerned with what can be thought of as infrastructures of social care – often developed via theories of social reproduction – it focuses on the services available in cities that provide health, education, and social care,

and on the gendered labor that supports such services (Hall, 2020; Meehan and Strauss, 2015; Strauss, 2020). This definition of social infrastructure is designed to draw attention to the "services and programs that support a safe and healthy community and maintain and promote its quality of life" (Lo et al., 2015, p. 4). With this definition social infrastructures are understood as including spaces such as hospitals, schools, care homes, mental health services – spaces that provide a wide range of specific functions, but are understood as collectively providing care for a whole range of vulnerable people. Important to this work has been understanding how much of the labor in these kinds of services is undertaken by women and is often underpaid and undervalued (Hall, 2020; Strauss, 2020). Embedded within the use of "infrastructure" as a concept to describe this work and these spaces, is to recognize the value of this of this kind labor – and the various institutions that this labor takes place in – in maintaining and sustaining society in the same way that clean water, efficient sanitation, and fast telecommunications is valued.

And the fourth definition being used is in the area of work focused on the infrastructures of social life – it understands social infrastructure as the public and quasi-public spaces and places that support social connection. This work is indebted to the work of the sociologist Eric Klinenberg. Studying the unequal rates of mortality of the 1995 Chicago heat wave he discovered that a decisive factor in whether or not vulnerable people lived, was whether or not they had access to a range of safe and functioning [public and quasi-public spaces] – sidewalks, churches, stores, cafes, parks. The reason these spaces were important was because they helped support a safe public social life, could someone go outside and spend time in public outside of their immediate residence? Did they have a network of people that would call in on them? He went on to understand these kinds of spaces as constituting a social infrastructure, and recognized that social infrastructures were essential to developing vital, inclusive, urban neighborhoods (Klinenberg, 2018; Mattern, 2014, 2018). In urban geographic research social infrastructures have been understood as being critical to the public life of cities (Latham & Layton, 2019), and are spaces that are vulnerable to underfunding and neglect (Penny, 2020; Shaw, 2019).

This is an exciting terrain for urban geographic research, albeit one that presents at times contradictory understandings of what counts as social infrastructure. Is it the spaces and places of social connection? The spaces of social reproduction? The social life of infrastructure? Or the social practices taking place in the absence of infrastructure? Although this breadth speaks to the intuitive fertility of "social infrastructure" as an analytical frame, it is also a challenge. Underlying these different empirical concerns are quite distinct and often diverging understandings of what is meant by "the social" and "infrastructure". Given this complexity it is worthwhile reflecting a little on how these ideas are being developed, used, and mobilized within urban geography, and how these distinctive framings come to shape understandings of different urban contexts.

3. Thinking with infrastructure

Infrastructure has become a central topic within urban geography. Given its ubiquity it is easy to forget that its rise to prominence is recent. Its importance is a product of how it orients us to a whole series of productive empirical inquiries, but also provides a theoretical imaginary that is attuned to the materiality of a whole range of complex

spatial arrangements. Infrastructure is a noun – the pipes, cables, satellites and so forth. And it entails a set of verbs – transporting, facilitating, delivering, servicing, supporting. This twofold value of infrastructure as a concept, means that it can be taken up in a wide range of settings and for a wide range of purposes. Infrastructure is a really useful concept to think with. As Tonkiss (2015) has argued, the appeal of infrastructure is the way in which it operates in-between; in-between conventional conceptual apparatus, in-between the social and material, and in-between physical objects – all the while shaping the way in which society is able to function. Within critical urban geography this has provided a vocabulary for understanding how in many cities certain groups are systematically excluded from access to water, power, and sanitation (McFarlane & Silver, 2017), and the way that infrastructure can come to represent "congealed social interests" (Graham & Marvin, 2001, pp. 11, citing Bijker, 1993). As Angelo and Hentschel (2015) observe, the interest is in the absence or presence of particular infrastructures in particular places. The critical concerns here are that infrastructures are key vectors of politics and power (Wakefield, 2018), and the ways that infrastructure are central to the uneven socio-spatial development of capitalist urbanization (Harvey, 1996).

But infrastructure is of interest to urban geographers for another – parallel – reason. Infrastructure is a useful term for thinking about what makes for The Good City, or just cities. The infrastructural critiques of Graham and Marvin (1995, 2001) and others rests on an insight that all sorts of physical infrastructures are necessary to sustain urban life. Infrastructures are not just vehicles of inequality and capital accumulation, they also, however imperfectly, provide all sorts of essential services. Amidst the concern about the unequal distribution and access of infrastructure, we should not lose sight of the reality that at root infrastructure is about the facilitation of activity. Infrastructures of all different sorts are one of the critical ways in which capacity is built into the urban environment. Through complicated mechanical engineering, bureaucratic arrangements, institutional agreements, repair, maintenance and robust funding, the capacity of cities to support collective life is increased (Star, 1999). And, by increasing the capacity of the urban environment, the burden on individuals can also be lessened. Thinking about infrastructures in terms of the life and activity they support and sustain, nudges us to think about the different categories of infrastructures that run through urban environments. All infrastructures are not the same, nor do they share the same material characteristics.

Social infrastructure draws on this idea of collective capacity building in the built environment, to study the spaces and places that support social life. However, it is important to note the different ways that those who use the term define its infrastructural qualities. Just as in work on other kinds of infrastructures there is need to be clear about the type of infrastructural systems being studied – roads are not the same as water or sanitation systems, telecommunication networks are not identical to food safety infrastructures – there is an imperative to recognize the different kinds of infrastructures riding together under the umbrella of "social infrastructure." In the four different approaches to social infrastructure outlined above, it is possible to identify four quite different ideas of infrastructure at play.

When Simone (2004) talks of people as infrastructure, he is drawing attention to the informal social and economic cooperation achieved by urban residents in the interstitial spaces of overlapping migrant, city council, and police territories and the work done by

people to make the city accommodating and habitable – how it "cultivates within them a . . . capacity to make something out of the city" (p. 425). The idea of infrastructure is operating in a metaphorical register "lend[ing] collective life the energetic language of infrastructure" (Simone, 2021, p. 3). The apparent absence of concrete physical infra-structure provision, should not be read as the complete of absence of infrastructures that sustain life. In McFarlane and Silver (2016, 2017) there is an interest in concrete physical infrastructures – infrastructures that facilitate efficient sanitation and the delivery of clean water – but there is a recognition that these kinds of infrastructures often require huge amounts of informal human work to extend provision and maintain it. Here social relations of trust become part of socio-technological infrastructural systems. These are not infrastructures of social life, but social networks and relations are recognized as a necessary component of infrastructural systems.

In the third way social infrastructure is being used, the idea of infrastructure at work in the research on social reproduction and care is concerned with the way infrastructures – systems of funding and provision – can be established to act on and support social relations; especially those for the most vulnerable. This work attends to the ways that places and services are provided to improve social outcomes – healthcare, eldercare, mental health, education. Here schools, hospitals, and a whole range of social services – as well as the often racialized and gendered labor that ensures these services can operate – are recognized as serving an infrastructural function. These are infrastructure in the way they deliver care and "maintain and sustains lifeworlds" (Hall, 2020, p. 89) – they are a whole series of usually overlooked and undervalued systems that allow society to function and reproduce themselves. Finally, in the fourth use of social infrastructure – and in the way we have worked with the term (Latham & Layton, 2019, 2020) – the infrastructures under study are the spaces and places that support social connection in public and quasi-public spaces (Klinenberg, 2018). The core idea is to recognize the wide range of spaces and facilities – the libraries, parks, gyms, sidewalks, stores, mosques, churches, community halls and so on – that facilitate a whole range of social activities in cities. This use of social infrastructure is not interested in the social totality of cities, but in the collective public life of streets and neighborhoods. And the infrastructural dimen-sion of the concept references the sites and facilities – and all the resources and institu-tions that sustain them – that are embedded in the built environment and that creates affordances for particular ways of living together. The term is not meant to refer to all the ways that humans are social; humans are of course fundamentally social animals. Rather it directs attention to a series of spaces and facilities – often overlooked and under-funded – that supports a robust public collective life in cities, and helps build into urban neighborhoods the capacity for all sorts of ways of being with others.

4. Urban sociality

To think about social infrastructure is to – either implicitly or explicitly – think about "the social" in cities and neighborhoods. It is also then to ask, What is the relationship between infrastructure and "the social"? As with the differing uses of infrastructure at work in the four approaches outlined above, each approach is also interested in quite different dimensions of social life. Given that cities are human creations, nearly all aspects of urban life can in some way be framed and understood as social. A key insight of

Science and Technology Studies (STS) and a range of post-human approaches studying cities, is that even seemingly asocial systems are in all sorts of ways inseparably social (Amin & Thrift, 2002; Latour, 1996; Mattern, 2021; Star, 1999). However that does not mean it is not worthwhile attempting to delineate the multiple domains of human social activity that take place in cities, and recognize what the different approaches to the concept of social infrastructure are interested in and concerned with.

What Simone is interested in – particularly in his 2021 reflection on people as infrastructure – is an idea of "the collective". How the urban majority in the global south can make ways of living for themselves. The collective life of cities is "something beyond notions of individuals, households, communities, and institutions" (Simone, 2021, p. 1). For Simone and those inspired by his work, social infrastructure is a way to grapple with the "continuous recombination of people's experiences and practices" – "away from reference to social bonds, ideological commitments, habitus, and communal sentiment"; away from more established ways thinking about the social life of cities. This is an expansive way of working with "the social". Many urban scholars have found it powerfully suggestive for engaging with the collective capacities and potential of the urban majority in the global south. However its drive to reframe all social relations within its own language makes it challenging to connect with other research in places that will have a higher background level of infrastructural provisioning – where the capacity for collective cooperation does not rely only on the fragile and committed efforts of people living in the absence of infrastructural provisioning. The value of the scholarship of Simone, and those drawing on his work, is that an absence of infrastructure does not mean an absence of social life in cities, and that "the social" can function in infrastructural ways.

Building on many of Simone's concepts, but focusing on existing physical infrastructures, the work of researchers such as McFarlane and Silver that focuses on the sociality gathering around infrastructure hangs on the insight that it is people that work on infrastructure, as much as it is infrastructure that supports people. Here "the social" is in many ways about various forms of labor – paid and unpaid, formal and informal – that attends to traditional hard physical infrastructures, or affects how such infrastructures are accessed. It is not necessarily the social life per se that is of primary interest, but the networks and connections that facilitate and allow access to particular infrastructural resources. This work is a reminder that in many places around the world it takes a great deal of often overlooked and under remunerated human endeavor to make infrastructures function. Although this domain of activity is of course highly social, it is not the kind of sociality that people may choose to pursue if they did not otherwise have to – or had other opportunities for sociability that was not tied so directly to labor.

In the work on infrastructures of social care the delineation between "infrastructure" and "the social" is framed in a different way. This work with its interest in healthcare, education, childcare, and eldercare – and all of the other essential social services that exist in cities – is concerned with infrastructures that more directly support social conditions. These may well take place in public and quasi public spaces like hospitals, schools, and care homes, but they also take place in domestic settings like the home (Hall, 2020). These are infrastructures that are critical for society being able to reproduce itself. This work is simultaneously interested in the practices and economies of care that support these social services. It highlights the care work that is not often recognized as paid labor,

but is nonetheless essential to the functioning of society. As a recent incisive intervention by Middleton and Samanani (2021) stresses, this raises important questions about what counts as care, how social researchers should attend to such care, and how matters of care can affect how we think about and approach the social world. This helps us recognize that for many people practices of care are central to how they structure and navigate their social worlds. It also recognizes that the social life of cities is about relations of intimacy and care that are all too often overlooked and undervalued. The social in this approach to social infrastructure is twofold, it is the social outcomes *and* it is also the human efforts that underpin such outcomes.

In the fourth definition and approach to social infrastructure – focusing as it does on the spaces and places that facilitate social connection – the different kinds of connections people have with others are front and center. This work is animated by an interest in understanding how a range of public, quasi-public, and community spaces function to support the social life of cities. Unlike the first two definitions and uses of social infrastructure outlined above, this approach takes opportunities for sociality as being the critical concern. The public life of cities and their neighborhoods is a key matter for people's sense of belonging, engagement with the places that they live, enjoyment and wellbeing (Klinenberg, 2018; Talen, 2019). However, this is not simply a case of reinvigorating an idea of social capital. Rather a central question is how to analyze and categorize the different forms and intensities of sociality that run through these sites. As social researchers, by paying close attention to the ways that people make use of varied communal places and facilities it is possible to examine the multiple registers of sociality that people are engaged in. Relationships of kinship and care are, of course, one of the key registers of sociality that people experience in cities, as is the making and maintaining of friendships. Although less personal, there is a sociality to co-inhabiting spaces with strangers. And, at the other end of the spectrum, are practices of full, fun, absorbing, enthusiastic engagement – be that collective experience and the carnivalesque, shared physical activity, or common political effort. The aim of this work is to better understand the enormously variable sociality of cities as generative in all kinds of ways.

5. The papers

The papers collected in the special issue illustrates the diversity of how the concept of social infrastructure is being put to use by urban geographers.

The first contribution, DeVerteuil et al.'s "The service hub as a bypassed social infrastructure: evidence from inner-city Osaka", examines the physical provision of social care for a broad range of marginal people centering on the Kamagasaki district of Osaka. The Kamagasaki service hub is notable for the volume and diversity of support provided by the care organizations that congregate together in a relatively small area. It is also remarkable for the largely improvised and ad hoc way has evolved over the decades. Whilst the service hubs like Kamagasaki play an essential role in holding together and repairing Japan's often fraying urban social fabric, they receive limited support from state agencies. In "Reimagining the physical/social infrastructure of the American street: policy and design for mobility justice and conviviality" Prytherch is also interested in the state's role in the provision of social infrastructure. The focus here, however, is on the possibilities for reimagining a network of physical infrastructures – the streets, sidewalks,

and highways of America's cities – as intrinsically social spaces. Physical infrastructures are not made once and for all. Instead they can over time, with sufficient civic pressure, political resolve, collective imagination, and institutional innovation, be reconfigured in surprising and transformative ways. For Prytherch, thinking with the concept of social infrastructure helps those interested in urban policy understand how, done right, initiatives such as complete streets might transform urban streets from highly engineered infrastructures for automobility (with the narrow sociality that affords) into infrastructures that facilitate direct face-to-face social connection.

The example of urban streets as potentially vital social places nudges us to consider how other urban infrastructural facilities might also be understood as social infrastructure. In "Activating urban environments as social infrastructure through civic stewardship", Campbell et al. examine how throughout New York City a range of non-state civic actors work with governmental agencies to support and care for a diverse range of natural spaces, sustaining them as social infrastructures. Parks are an obvious case, but there are many other "natural" spaces that also support all kinds of social connection in NYC. Central to Campbell et al.'s argument is that urban researchers need to attend closely to the practices of stewardship that weave through the work of civil activists; this work does not just sustain and transform urban environments, it also weaves together networks of civic engagement.

In "Light infrastructures and intimate publics in the vertical city" Ebbensgaard returns our attention to the technological infrastructures that run as physical networks through the public and private spaces of cities. Here, Ebbensgaard explores how technological infrastructures like those that light the apartments, buildings and streets of London's East End generate a range of intimate publics through which those residing there gain an – often precarious – sense of connection with others. This paper also suggests something of the limits of urban infrastructure as a bridge across groups, different background infrastructures signal both a loosely defined neighborhood commonality and mark lines of deep inequality. The final paper of the special issue, "Social infrastructure and public life – notes on Finsbury Park, London", by Layton and Latham, focuses in more detail on the forms of social connection that well provisioned social infrastructures can afford. Here – as in Campbell et al's contribution – a central argument is that it is important to think carefully about what we understand the "social" to be. The paper also highlights that social infrastructures are used – and are understood – differently by different social groups, and this difference is often the source conflict. The special issue wraps-up with an afterword by Jennie Middleton and Farhan Samanani, "Whose city? Which sociality?"

6. Conclusion

The five papers and commentary of the special issue provide a wide ranging and intellectually challenging sketch of work on social infrastructure. They also demonstrate the productiveness of the concept as a way of thinking through the ways in which urban environments can function to connect and sustain individuals and groups; along with highlighting the complexities of provisioning such infrastructures. The concept of social infrastructure can help orient urban researchers toward what makes for a Good City. Not least by being clear about how challenging it can be to provide good social infrastructures. One of the reasons the term has taken hold – in a wide range of places and

contexts – is that the kinds of spaces and places that social infrastructure is concerned with are precisely the kinds of spaces that are often overlooked and underfunded. Despite the contribution they make to people's wellbeing and sense of community in place, spaces like libraries, leisure centers, parks, and community centers are all too often at the sharp end of the politics of austerity. By studying social infrastructures then, it is possible to get a better idea of why these spaces matter to people and the diverse kinds of social and collective life they facilitate, but also to get an acute awareness of the stresses and challenges they face to remain open, accessible, and well maintained.

Acknowledgement

Disclosure statement

Funding

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References

Amin, Ash, & Thrift, Nigel. (2002). *Cities: Reimagining the city*. Polity.

Anderson, Elijah. (2011). The cosmopolitan canopy. *The Annals of the American Academy of Political and Social Science*, *595*(1), 14–31. https://doi.org/10.1177/0002716204266833

Angelo, Hillary, & Hentschel, Christine. (2015). Interactions with infrastructure as windows into social worlds: A method for critical urban studies: Introduction. *City*, *19*(2–3), 306–312. https://doi.org/10.1080/13604813.2015.1015275

Blokland, Talja. (2017). *Community as urban practice*. Polity.

Desai, Renu, McFarlane, Colin, & Graham, Stephen. (2014). The politics of open defecation: Informality, body, and infrastructure in Mumbai. *Antipode*, *47*(1), 98–120. https://doi.org/10.1111/anti.12117

Graham, Stephen, & Marvin, Simon. (1995). *Telecommunications and the city: Electronic spaces, urban places*. Routledge.

Graham, Stephen, & Marvin, Simon. (2001). *Splintering urbanism: Networked infrastructures, technological mobilities and the urban condition*. Routledge.

Graham, Stephen, & McFarlane, Colin. (2015). *Infrastructural lives: Urban infrastructure in context*. Routledge.

Hall, Sarah. (2020). Social reproduction as social infrastructure. *Soundings*, *76*(winter), 82–94. https://doi.org/10.3898/SOUN.76.06.2020

Harvey, David. (1996). *Justice, nature and the geography of difference*. Blackwell.

Klinenberg, Eric. (2018). *Palaces for the people: How to build a more equal and united society*. Penguin Random House.

Latham, Alan, & Layton, Jack. (2019). Social infrastructure and the public life of cities: Studying urban sociality and public spaces. *Geography Compass*, *13*(7), 1–15. https://doi.org/10.1111/gec3.12444

Latham, Alan, & Layton, Jack. (2020). Kinaesthetic cities: Studying the worlds of amateur sports and fitness in contemporary urban environments. *Progress in Human Geography*, *44*(5), 852–876. https://doi.org/10.1177/0309132519859442

Latour, Bruno. (1996). *Aramis: Or the love of technology*. Harvard University Press.

Lo, Lucia, Preston, Valerie, Anisef, Paul, Basu, Ranu, & Wang, Shuguang. (2015). *Social infrastructure and vulnerability in the suburbs*. University of Toronto Press.

Mattern, Shannon. (2014). Library as infrastructure. *Places Journal*, (2014). https://doi.org/10.22269/140609

Mattern, Shannon. (2018). Community plumbing. *Places Journal*, (2018). https://doi.org/10.22269/180717

Mattern, Shannon. (2021). *A city is not a computer: Other urban intelligences*. Princeton University Press.

McFarlane, Colin, & Silver, Jonathon. (2016). The political city: "Seeeing sanitation" and making the urban political in Cape Town. *Antipode*, *49*(1), 125–148. https://doi.org/10.1111/anti.12264

McFarlane, Colin, & Silver, Jonathon. (2017). Navigating the city: Dialectics of everyday urbanism. *Transactions of the Institute of British Geographers*, *42*(3), 458–471. https://doi.org/10.1111/tran.12175

Meehan, Katie, & Strauss, Kendra. (2015). *Precarious worlds: Contested geographies of social reproduction*. University of Georgia Press.

Middleton, Jennie, & Samanani, Farhan. (2021). Accounting for care within human geography. *Transactions of the Institute of British Geographers*, *46*(1), 29–43. https://doi.org/10.1111/tran.12403

Penny, Joe. (2020). Defend the ten': Everyday dissensus against the slow spoiling of Lambeth's libraries. *Environment and Planning. D, Society & Space* 38 5 923–940 doi:10.1177/0263775819893685 doi:. Advance online publication.

Shaw, Ian. (2019). Worlding austerity: The spatial violence of poverty. *Environment and Planning. D, Society & Space*, *37*(6), 971–989. https://doi.org/10.1177/0263775819857102

Simone, AbdouMaliq. (2004). People as infrastructure: Intersecting fragments in Johannesburg. *Public Culture*, *16*(3), 407–429. https://doi.org/10.1215/08992363-16-3-407

Simone, AbdouMaliq. (2021). Ritornello: "People as infrastructure". *Urban Geography*, 1–8. https://doi.org/10.1080/02723638.2021.1894397

Star, Susan Leigh. (1999). The ethnography of infrastructure. *American Behavioral Scientist*, *43*(3), 377–391. https://doi.org/10.1177/00027649921955326

Strauss, Kendra. (2020). Labour geography III: Precarity, racial capitalism and infrastructure. *Progress in Human Geography* 44 6 1212–1224 doi:10.1177/0309132519895308 . Advance online publication.

Talen, Emily. (2019). Neighbourhood. Oxford University Press.

Talen, Emily. (2019). *Neighbourhoods*. Oxford University Press.

Tonkiss, Fran. (2015). Afterword: Economies of infrastructure. *City*, *19*(2–3), 384–391. https://doi.org/10.1080/13604813.2015.1019232

Truelove, Yaffa. (2011). (Re-)Conceptualizing water inequality in Delhi, India through a feminist political ecology framework. *Geoforum*, *42*(2), 143–152. https://doi.org/10.1016/j.geoforum.2011.01.004

Wakefield, Stephanie. (2018). Infrastructure of liberal life: From modernity and progress to resilience and ruins. *Geography Compass*, *12*(7), 1–14. https://doi.org/10.1111/gec3.12377