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Abstract

This article traces the trajectory of critical geographical scholarship on the body's intertwinement with infrastructure systems. In doing so, it argues that although the body is not ontologically infrastructure, it can nevertheless enable infrastructure's functioning – whether by being made into infrastructure of surplus value production or by suturing widening gaps in sub-optimal infrastructure systems. Analysing these dynamics, the article theorises the body as *infrastructured* – given over to the violence of capital and its infrastructures that subject specifically gendered, racialised, and classed bodies to surplus value extraction and/or abandonment; but also as simultaneously fleeting in its irreversible exposure to this violence.

Keywords

body, infrastructure, violence, fugitivity, infrastructured bodies

I Introduction: Embodied geographies of infrastructure

The 'infrastructural turn' (Addie et al., 2020) in critical geography, anthropology, and adjacent fields has foregrounded infrastructure as a material, social, and political field of power (e.g. Anand, 2017; Fredericks, 2018; Lemanski, 2019; Silver, 2014; Simone, 2004; Von Schnitzler, 2018; Harvey and Knox, 2005, among others). In this interdisciplinary work, the acknowledgment of the indelible relation between bodies, infrastructures, and urban forms was foundational. Urban political ecology, for instance, perceived the materiality of infrastructures and bodies as a shared, mutually constitutive ontology of the city and urban life (e.g. Gandy, 2005). However, in this scholarship, the body – as a phenomenological reality and an analytic frame – remained relatively unexplored (see Callard, 1998; Doshi, 2017), even if the function of 'people' was key to understanding cities and their infrastructures (e.g. Simone, 2004). This has recently started to change, with an increasing emphasis on multiple entanglements between bodies and infrastructures (e.g. Datta and Ahmad, 2020; Sultana, 2020; Truelove and Ruszczyk, 2022), as well as an explicit theoretical emphasis on the body's ontology as a fundamental infrastructure of the city, capital, and life itself (e.g. Addie, 2021; Andueza et al., 2021; Fredericks, 2021).

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Tracing the trajectory of this work on the body's intertwinement with infrastructures, in the article, we explore how critical geographical scholarship on infrastructure has navigated the concept and lived experiences of the body as a subjective, intimately lived geography of infrastructure.[1] Taking stock of these literatures, we theorise the body as infrastructured – given over to infrastructure's violence but also simultaneously fleeting in its exposure to this violence. In contrast to recent literature (e.g. Addie, 2021; Andueza et al., 2021; Fredericks, 2021), we argue that bodies are not themselves ontologically infrastructure but, instead, can *become* infrastructure – that is, they can be *infrastructured*. This process of infrastructuring occurs through the violence of infrastructure systems that subject human bodies and their capacity to labour to surplus value extraction. This is a historically and socially specific argument. In an ontological sense, infrastructure in and of itself is not violent: it can give life as well as take it away. As LaDuke and Cowen (2020, p. 264) note, 'infrastructure is how sociality extends itself; it is how life is provisioned or curtailed'. However, under the (*for now*) inescapable reality of racial, settler colonial, patriarchal capitalism, socio-material infrastructures in cities and their planetary hinterlands are inherently violent (e.g. Truscello, 2020). This violence is structurally and directly inflicted onto the bodies of those who are dispossessed through racial (Gilmore, 2017; Mulings, 2021), settler colonial (Kinder, 2021; LaDuke and Cowen, 2020; Spice, 2018), and patriarchal (Truelove and Rusczyk, 2022; Datta and Ahmed, 2020) logics of capitalism. As we will discuss and exemplify below, specifically racialised, classed, and gendered bodies (rather than being in and of themselves infrastructure) become violently *infrastructured* for the ends of capital.

Debates on infrastructural violence are not new. Over a decade ago, anthropological work highlighted how infrastructure engenders logics of violence in its wake (e.g. Appel, 2012; Rodgers, 2012; Rodgers and O'Neill, 2012). However, as Lesutis, (2022d) notes, these dynamics of violence have been side-lined in affirmational depictions of infrastructures' possibilities for world-making. For instance, foregrounding the openness and malleability of infrastructure, Lawhon et al. (2018) emphasise that 'infrastructure is dynamic, undergoing continuous change of construction, assembling, repair and maintenance' (p. 726). Silver (2014) also writes that 'incremental infrastructures and the ways that they are constituted articulate a prefigurative politics in which residents seek to generate access to new infrastructural worlds' (p. 788). It is indeed a *promise* of infrastructure rather than its violence that dominates recent scholarship (e.g. Anand et al., 2017), in which this promise is perceived as 'unruly and expansive', resting 'on the open possibility of that which has yet to happen' (Harvey, 2018, 99).

Nevertheless, more recent work on the 'body as infrastructure' offers a more nuanced analysis that acknowledges the inherent violence of infrastructure, not in a future tense of 'open possibility' but as 'already visible and knowable' (Lesutis, 2022d, 944). Addie (2021), Andueza et al. (2021), and Fredericks (2021), for instance, highlight the exploitation of precarious workers rendered dispensable and disposable infrastructures for surplus value production in cities and their hinterlands. Bodies can also be made to perform the function of infrastructure in contexts of inadequate infrastructure systems that are essential for social reproduction. Highlighting this, Datta and Ahmad (2020) and Truelove and Ruszczyk (2022) focus on the bodies of women in postcolonial cities that, through practices of care and social reproduction, substitute faltering water provision systems in their communities. As the body's capacity to labour becomes intimately intertwined with infrastructure systems (e.g. Stokes and De Coss-Corzo, 2023), it is made into infrastructure for surplus value production or is tasked with performing the function of infrastructure. Reflecting upon these dynamics, we argue that *to infrastructure* invariably involves giving the body over to the violence of exploitation and neglect, or of dispossession and abandonment, in both explicit and implicit ways. In other words, the body becomes *infrastructured* for surplus value production or is made the discardable surplus thereof. *To infrastructure*, therefore, is a mode of structural and corporeal violence to which specifically racialised, classed, gendered bodies are given over for the ends of capital as we shall exemplify in the following sections.

This is not a conceptual closure, however. The body can be infrastructured but not necessarily irreversibly so. Whilst the body is exploited, dispossessed, or subjected to premature death by infrastructure, at the same time, the body flees from becoming solely an infrastructure of surplus value production. In the article, among other examples, we discuss how maroon geographies were created by fugitive enslaved people who fled plantations that had objectified their bodies, making them fleshy infrastructures of racialised plantation economies (e.g. da Silva, 2021; Winston, 2021). We understand this dialectic between violence and fugitivity as the indeterminacy of the body expressed as a liveliness of human life that exceeds the mechanisms of power (e.g. Harney and Moten, 2021), including the violence of infrastructure. In an ontological sense, therefore, bodies are expressions of fugitivity – as multitudes of possibility, they can never be completely controlled by power, as critical feminist (e.g. Butler, 1993), queer (e.g. Berlant, 2016), and black[2] (e.g. Weheliye, 2014) traditions, for instance, highlight. Indeed, bodies can build normatively different kinds of infrastructure. As feminist, queer, and decolonial thought-inspired scholarship on infrastructure foregrounds, active subversion of capital's infrastructural systems of extraction and dispossession can enact the very possibility of an 'infrastructural otherwise' (Cowen, 2017) – 'fugitive' and 'alimentary infrastructures' (LaDuke and Cowen, 2020), as well as various expressions of indigenous reworkings of infrastructure systems (e.g. Estes, 2019; Kinder, 2021; Spice, 2018). In this sense, under radically different social and material systems of valuation, infrastructuring unfolds through multiple possibilities for life to flourish (see Berlant, 2016, 2022).

However, with our argument that approaches bodies as *infrastructured*, we want to emphasise that, in spite of these potentialities of infrastructure, under conditions of racial, settler colonial, patriarchal capitalism, infrastructure systems primarily function as modes of violence inflicted on those dispossessed. Infrastructures of the otherwise (e.g. Berlant, 2016; Cowen, 2018; Estes, 2019; Kinder, 2021; LaDuke and Cowen, 2020; Spice, 2018), therefore, exist precariously within the enduring violence of capital's infrastructures (Mullings, 2021). In this sense, those approaches that overemphasise infrastructure as inherently open to world-making, reconfiguration, and full of potential tell only half the story: whether there are potentialities or not, they are frequently and violently foreclosed. In other words, there is an escape from the violence of infrastructure – for bodies are fugitive – but there is no escape from the fact that powerful forces of racial, settler colonial, patriarchal capitalism continually work *to infrastructure* racialised, classed, gendered bodies in inherently violent ways.

The article is structured as follows. First, we discuss how, following the 'infrastructural turn', critical scholarship on infrastructure, cities, and urban life, with its implicit focus on embodiment but direct focus on urban lives, foregrounded infrastructure as a possibility of reconfiguration. Second, we analyse how, in recent years, explicit critical scholarship's focus on the body and its capacity to labour as a fundamental infrastructure of capital, urban life, and sociality, has emphasised the violence of infrastructure through which the body is made an exchangeable and interchangeable part within larger infrastructural configurations of capital. Third, focusing on the body's fugitivity, we highlight how the body, despite being violently rendered an infrastructure of surplus value production, cannot be irreversibly infrastructured. The concluding section reflects on the theoretical, empirical, and political implications of the main argument presented in the article.

I Infrastructure as a possibility – infrastructural lives

As Foucault (1979) argued, the direct and implicit control of the body – specifically, the privatisation of bodily functions – was a hallmark of modern state formation in Europe. This centrality of the body in state practices of sovereignty, control, and territorialisation had been visualised much earlier on the iconic front cover of Tomas Hobbes's (1651) first edition of the *Leviathan* (see Bredekamp, 2007) depicting the torso of the crown-wearing sea monster to be made up of densely packed human bodies. This instrumental role of the body in the un/making of

state sovereignty permeates critical inquiry in social sciences: from Marx's (1990) labour theory of value to post-structuralist theorisation of gender, sex, and performativity (Butler, 1993), as well as more recent theories of the state (Epstein, 2021) and global politics (Purnell, 2021).

The instrumental role of the body in the making of capital and state sovereignty is also prominently featured in critical geographical scholarship that highlighted multiple interdependencies between bodies, infrastructures, and cities (Marvin and Medd, 2006, 145). In urban political ecology scholarship that was amongst the first to emphasise the intersection between bodies, infrastructures, and technical systems, Haraway's (1991) work on situated knowledge was foundational – it highlighted the importance of the geographical and historical situatedness of embodied subjects in ways of experiencing urban life, as well as being in the world and of the world. In Gandy's work on 'cyborg urbanisation' the city was perceived as a prosthetic of the body. Here, the figure of the cyborg – originally employed by Haraway (1991) to challenge disembodied, masculinist, and teleological epistemologies of knowledge and subjectivity – was taken up to theorise the contemporary metropolis as an effect and mediation of multiple technological processes, networks, and aesthetic discourses but also as a space of abstraction that, if lived inter-subjectively, 'fleshes out' possibilities of a dignified life in parallel to intensifying urban developments (Gandy, 2005, 38). Within the same logic, the literature on urban metabolism (Gandy, 2005; Heynen et al., 2006; Kaika, 2004; Swyngedouw, 2004) approached the city as a metabolic process of circulations and flows mediated through biophysical and social networks of bodies, infrastructures, and political economies, in which uneven power relations are continuously reconfigured. Within this literature, Loftus (2012) emphasised a 'sensuous creation of everyday life' and proposed reimagining urbanisation as a 'simultaneously bodily and global process' (p. x).

However, as Doshi (2017) notes, despite these gestures to embodiment, the intertwinement between the materiality of bodies and infrastructure systems remained under-theorised in both urban political ecology and infrastructure scholarships (also see Canoy, 2021). Indeed, since the interdisciplinary 'infrastructural turn', infrastructure has been perceived as relational, intersectional, and indelibly social (e.g. Harvey and Knox, 2015; Silver, 2014; Star, 1999) rather than as fundamentally corporeal. Here, infrastructuring is a form of possibility that enables life's flourishing in spite of the precarity in and of the city. Simone's (2004) key contribution theorised 'people as infrastructure', thus highlighting that essential urban systems and infrastructures are in fact sustained and supported by the multiplicity of livelihood strategies. For Simone (2004), improvisation in, and of, urban spaces involves everyday practices through which people, infrastructures, and objects come together, engendering new configurations of the urban and providing multiple possibilities of liveability, on top of securing a level of temporary stability for the function of the city. In Simone's work and in the literature that engages with his concept 'people as infrastructure', precarious urban lives are key to understanding the city. Nevertheless, even in this widely influential work, attention to bodies, embodiment, and corporeality remained implicit rather than theoretically foregrounded.

Following Simone (2004), a new strand of work emerged that, focusing on the *liveliness* of infrastructure, foregrounded how the relational, ever-changing nature of infrastructure is mediated by social subjects and their quotidian struggles for liveability under precarious urban conditions. Graham and Macfarlane (2015) were amongst the first to pay closer attention to questions of embodiment and to theorise urban *lives* as profoundly *infrastructural* – embedded in complex socio-technological systems and networks of infrastructure that enable life in the city. Across multiple urban contexts where fungible materialities of infrastructure over-spill into everyday life, reiterating pre-existing forms of instability or opportunities for reconfiguration, infrastructures become *lively* as Amin (2014) put it. Lawhon et al. (2018) also engage with the way visible and concealed networks of embodied infrastructures are deeply implicated not only in the (un)making of individual lives but also in how people experience community, solidarity, and ongoing struggles for liveability. Silver (2014)

focuses on how the constitution of informal constructions and extensions of key infrastructure articulates a type of prefigurative politics when urban residents attempt to find, sustain, and enhance their access to new infrastructures in expectation of a better life that these might provide. Here, infrastructure functions as a type of social practice central to world-making – 'a kind of mentality and way of living in the world' (Larkin, 2013, 331). In other words, *to infrastructure*, is to (re)build social worlds.

In recent years, geographers also started to extend analyses of infrastructure beyond everyday lives and urban forms, mainly by examining how infrastructure systems enable or disavow different modes of political belonging in the city. Central to this strand of work has been people's quotidian engagement with state practices of sovereignty that constitute multiple expressions of, and claims to, citizenship. For instance, the volume on 'infrastructural citizenship' edited by Lemanski (2019) examines the material and civic nature of urban life for both the state and its citizens, where citizenship is 'frequently mediated through the materiality of public infrastructure' and people's access to it (p. 8). Although the notions of citizenship are disembodied – as they do not explicitly acknowledge the materiality of relations between bodies, their labour, and infrastructure – this nevertheless highlights how people become infrastructures of civic life in the city. This understanding of infrastructure's socialities echoes the expansive, relational understanding of infrastructure developed in contemporary social theory more broadly. For Berlant (2016, 393), for instance, 'infrastructure is defined by the movement or patterning of social form. It is the living mediation of what organizes life: the lifeworld of structure'.

Geography's relational focus on infrastructure and citizenship is not altogether new. Such enabling forms of infrastructuring had earlier been highlighted by anthropological scholarship on political belonging mediated by and through infrastructure systems. For Harvey and Knox (2015), 'the "public" itself also has to be conjured up as a material presence alongside [infrastructure projects]' (p. 88). (De Boeck, 2012, np) referred to infrastructure as material forms 'around which publics thicken'. According to Von Schnitzler (2018), infrastructures relate populations to states as publics, where citizenship is performed by those articulating claims to human dignity and political belonging through securing access to such essential infrastructures as those of water provision. Anand (2017) approaches these infrastructures as central in constituting 'hydraulic citizenship' that emerges through the continuous efforts to control, maintain, and manage the city's water flows and infrastructures. Indeed, as Larkin (2013) writes, infrastructures 'address and constitute subjects' (p. 329) – railway and road networks, communication systems, or networks of basic service provision mobilise different publics through 'affect and the senses of desire, pride, and frustration' (p. 333).

In this sense, infrastructure as a type of enabling action is mediated through modalities of governance characterised by a heterogeneously situated, quotidian interplay between state practices of sovereignty and multiple publics subjected to – as well as contesting – social, economic, and political modes of power mediated through infrastructure (e.g. Anand, 2017; Harvey and Knox, 2015; Lemanski, 2019; Von Schnitzler, 2018). However, as Lesutis, (2022b) demonstrates in the context of contemporary Kenya where the central state-led mega-infrastructure projects purposely differentiate between the *publics* included in, and the *populations* excluded from, the state's development visions, as well as unstable subject dispositions in-between, this relationship between infrastructures and a public/citizenry cannot be taken as a given. This is so because such notions of belonging as 'citizen' might result in epistemological obscurity, particularly so in the postcolony whose histories are shaped by particularly grotesque logics of coloniality (Mbembe, 2019) and racial capitalism (Lesutis, 2023b) and thus escape inherently liberal conceptualisations of state–society relations and a post-political discourse of rights to citizenship (e.g. Zeiderman, 2016). Indeed, these relations can be more effectively understood through the analysis of bodies as violently infrastructured, which we turn to discuss next.

2 Gendered, classed, and racialised embodiments of infrastructure

Recently, scholars started paying systematic attention to the embodied aspects of infrastructure as they have shifted their focus on how relations of labour,

social reproduction, and care are intertwined with infrastructure systems. Almost by necessity, this change of focus that foregrounds labouring practices of specifically gendered, classed, and racialised bodies invites a more explicit analysis of embodiment. In this epistemological context, critical geographical work began to emphasise the blurring of the ontological boundaries between infrastructures and bodies, acknowledging how they are directly implicated in each other's form, production, and existence.

This attention to the intertwinement between labour and infrastructure has been at the centre of critical feminist work on infrastructure (e.g. Datta and Ahmad, 2020; Truelove, 2019; 2021; Sultana, 2020). This scholarship foregrounds intersectional, embodied, and deeply differentiating experiences of urban life and its infrastructures as city dwellers attempt to build their lives in worlds of not their own making. Fredericks (2018), for instance, developing a materialist reading of infrastructure, demonstrates how specifically gendered and classed bodies labour in unequal ways in waste infrastructure networks in Dakar, Senegal. Here, it is poor women who are primarily responsible for waste disposal, collection, and cleaning in the city. In effect, their labouring bodies become infrastructured: in contexts lacking public service provisions, they are made essential parts of urban waste collection and cleaning infrastructures. At the same time, however, due to their marginalised gender and class position, they can also be easily disposed of. Both indispensable and disposable, women's bodies are reified in the city. Their bodies, therefore, function as gendered and classed mediations of the socio-political differentiations that comprise the materiality of waste collection infrastructures. This highlights how multiple vectors of power in the unequal, patriarchal, postcolonial city infrastructure specifically gendered and classed bodies in profoundly differentiating ways.

Echoing this, Truelove (2019) examines how, in postcolonial cities, poor, marginalised women's capacity to complete arduous, financially uncompensated quotidian chores facilitates the smooth flow of resources and functions through infrastructure networks. As women carry buckets of water and provide essential resources to their families and communities, accessing water beyond state-controlled networks via tube wells and tankers, their bodies constitute 'gendered infrastructural assemblages' (Truelove, 2021). Here, the affective, social, and material labour of bodies is key to technical-corporeal assemblages of infrastructure systems. When water pipes run dry, women, carrying buckets of water for their communities, so that their husbands and children can be bathed and fed, become essential for the social reproduction of labour power needed for surplus value production in the city (see Sultana, 2020; Truelove and Ruszczyk, 2022). In this sense, emotional labour connects individuals and communities, communal caretaking sustains urban life, and physical labour of gendered bodies enables the functioning of faltering infrastructure systems, which highlights 'the importance and specificity of human labor' in the functioning of infrastructure systems (Stokes and De Coss-Corzo, 2023, 43). The body, therefore, is not a site in and of itself; instead, it is infrastructured by the patriarchal city as women's bodies fill the gaps created by the unequal development of the city. In these contexts, sustained theoretical attention to the body and its labouring practices foregrounds how multiple – urban, regional, and local – scales of space-making intersect with gender and class, and how this shapes im/possibilities of liveability in unequal, patriarchal, postcolonial cities (Truelove, 2019, 3).

This analytical attention to gendered and classed embodiments of infrastructure systems, or the lack thereof, highlights how infrastructures are made, reworked, and sustained, how networks and systems of provision span across urban space to intimate spaces of bodies, and how life is constituted across profoundly unequal and differentiating geographies of urban development (Truelove and Ruszczyk, 2022). As Sultana (2020) argues, 'embodied intersectionalities of difference' that make or undo belonging in the city are 'simultaneously social, spatial, and material' (p. 1420). These situated approaches to urban systems foreground how material forms of infrastructure intersect with embodied labour and affective responses of specifically gendered and classed urban residents. Ramakrishnan et al. (2021) understand this as 'the micro-politics of caring for infrastructure and of access more broadly' (p. 679).

Here, in multiplicities of life-making in the city, power vectors of class and gender collide in an overbearing coalition of hardship, rendering bodies of designated population groups infrastructured.

Expressed as precarity – immanent to, and unfolding through, spatial configurations of capital (see Lesutis, 2022a) – the body's intertwinement with the systems of infrastructure and provision is primarily defined by a relationship of violence. This resonates with earlier developments in social anthropology that had demonstrated how infrastructure systems subject vulnerable groups to suffering, harm, and premature death, theorised as *infrastructural violence* that inflicts structural and corporeal modes of injury (e.g. Appel, 2012; Rodgers, 2012; Rodgers and O'Neill, 2012). Critical geographical scholarship highlighted how this violence of infrastructure occurs in specific historical and social contexts of racial, settler colonial, and industrial capitalism. Salamanca (2011), for instance, demonstrated how infrastructural violence (e.g. barbed wired walls, fences, and checkpoints that materialise social segregation of the apartheid state), mastered in Israel's tactical calculations of settler colonialism in the occupied Palestinian territories, intentionally 'undoes the ordinary geographies of everyday life by generating and unfolding a hostile topography of infrastructure networks' (p. 35; also see Weizman, 2007). Echoing these insights, Truscello (2020) argues that 'every new infrastructure project initiated by industrial capitalism generates a "brand new corpse"' (p. 263) – social and ecological topographies of life exploited to the point of annihilation. In this sense, the modern (capitalist) state depends on industrial infrastructures (of natural resource extraction, regional highway or railway systems, amongst others) that do not 'let live' but 'make die'. These relations of infrastructural violence have been vividly foregrounded by scholarship from critical indigenous perspectives that perceive infrastructures essential to capitalist development – railways, pipelines, and highways – as modes of colonial, epistemological, and racialised violence and domination (e.g. Estes, 2019; Kinder, 2021; LaDuke and Cowen, 2020; Spice, 2018).

Reflecting on these dynamics of infrastructural violence, Lesutis (2022c) highlights how, in postcolonial Kenya, mega-infrastructures disorder ecologies of social reproduction for historically marginalised and racialised population groups (Lesutis, 2023b). Here, infrastructures are central to the modalities of governance that oscillate between biopolitical (Foucault, 1979) and necropolitical (Mbembe, 2019) logics of power and control. As regional railways and seaports disrupt mobility patterns of racialised groups and their access to natural resources necessary for social reproduction, infrastructures directly inscribe and sustain sociopolitical neglect. This happens through the decoupling of their labour from new infrastructure systems: whilst racialised groups might be used as cheap labour to construct mega-infrastructures, upon the completion of such projects, they are discarded from systems of surplus value production for they are not needed for the functioning of mega-infrastructure systems that are explicitly oriented towards the transportation of goods and resources to global commodity markets (Lesutis, 2020). Here, *to infrastructure* means to give the body over to structural violence: it is to negate livelihoods and labour of racialised and classed populations, folding the body into the discard of infrastructural biopolitics of the postcolonial state and capital (also see Lesutis, 2022d).

Besides these infrastructural modes of disavowal (Lesutis, 2022c), explicit focus on the embodiment of infrastructures shows that to be *infrastructured* – rendered an exploitable, disposable part of infrastructures that co-constitute capital's violence – is to be exposed to not only structural forms of harm-making but also to direct, corporeal modes of injury. For instance, acknowledging bodily harm implicated in infrastructure systems (or the lack thereof), Datta and Ahmad (2020) foreground urban violence and gendered safety, demonstrating how faltering infrastructure systems result in intimate violence, typically in explicitly gendered ways. Without support from the state or from male household members, infrastructural failures – inadequate water and sewage, street lighting, or public transportation systems – become to women 'sites, spaces and nodes of intimate violence' (Data and Ahmed, 2020, 68). In these circumstances, specifically gendered and classed bodies rendered socio-material, fleshy infrastructures of city-making (Truelove, 2019; 2021)

are simultaneously made disposable parts of the city onto which the violence of patriarchy can be projected and grotesquely imposed. In this sense, the woman's body is not fully her own but is subjected to the everyday violence of infrastructure across different scales of the unequal city (also see Truelove and Ryszczyk, 2022).

These dynamics of infrastructural violence extend beyond the question of gender. As recent literature on 'the body as infrastructure' highlights (e.g. Andueza et al., 2021; Fredericks, 2021), under capitalism, the body functions as infrastructure in a broader – but, necessarily, geographically and historically specific – sense. As Andueza et al. (2021) argue, within capitalist modes of production, the body is made 'a technology that circulates something other than itself as it becomes enrolled in the process of production. In the body <…> the "something else" in circulation is the production of the capitalist form of value' (p. 7). In this sense, urban infrastructure networks do not function as prosthetics of the human body that mesh corporeal and urban ontologies into cyborgian forms of urbanisation (e.g. Gandy, 2005). Instead, this historically and socially specific relation between the body and the (capitalist) city manifests in reverse: bodies become *infrastructured* as they are made to function as 'recalcitrant extensions of an urban infrastructural space, increasingly subsumed under the requirements of the smooth circulation and accumulation of capital' (Andueza et al., 2021, 6). Here, bodies are reduced to parts of the infrastructure of capital accumulation. Therefore, under capitalism, the body that labours to reproduce itself under conditions of not one's own making is *infrastructured* – rendered an instrumental, exploited, and disposable part within broader systems of surplus value production and appropriation.

Echoing our understanding of bodies as *infrastructured* through the intertwinement between labour and infrastructure systems, Fredericks (2021, 4) highlights how in Dakar's urban landfills precarious waste pickers function as 'embodied infrastructural labour'. Collecting discarded items made of plastic and other reusable matter that can later be repurposed in industrial cycles of production, these waste pickers return the city's detritus to circuits of monetary exchange, in this way generating surplus value in sites of waste and discard. Through these acts of labouring, the body – that suffers exposure to multiple toxicities and insecurities of an urban waste site – functions as an integral part of relentless capital accumulation that expands and intensifies even within sites traditionally considered abject to capitalist modernity. In this sense, the violence of abstraction under capitalism – aiming to render all parts of material and sensuous life exchangeable and interchangeable (Lefebvre, 1991, 97, 370) – transforms the labouring body of a precarious waste picker into an infrastructure of production. In other words, the dispossessed body, even if decoupled from the formal regimes of labour and infrastructure, becomes *infrastructured* – rendered a fleshy, discardable infrastructure of surplus value production – in sites of discard and abandonment.

These dynamics of infrastructuring are not confined to abject spaces, however. Under the conditions of contemporary capitalism, the apparent invisibility of violently infrastructured bodies is foundational in the physical infrastructures of cities and their hinterlands. Streets and bridges on which we walk effectively are extensions of bodies that had laboured in their construction. As Addie (2021) notes, 'our cities and their infrastructures are figuratively and literally built on the bodies of alienated laborers at the same time as we rely on their adaptive and improvised social infrastructures to buttress the operation of urban socio-technical systems' (p. 8). In other words, urban infrastructures exist as both everyday human practices and as products of human labour – the corporeal capacity to transform the material world. Foregrounding this socially and geographically specific relationality between the body and material infrastructures, Addie (2021) demonstrates how multiple livelihood practices undertaken by subaltern groups – or Simone's (2004) 'people as infrastructure' – are necessarily shaped in a dialectical tension with an always present and looming 'infrastructural death'.

On the one hand, this 'infrastructural death' is expressed as the corporeal experiences of 'premature death' – a sacrifice to the political and economic ends of capital (Tyner, 2019) when bodies, once infrastructured, are rendered unnecessary and thus discardable/discarded (Lesutis, 2022a, 98-124). For

instance, in settler colonies, large-scale transportation infrastructures were built on the bodies of racialised labourers, many of whom died in the process of construction; whether it was colonial subjects transported from India to build the Uganda Railway in British East Africa (Ruchman, 2017), or enslaved Africans brought to work on plantations in the Americas (Ranganathan (2020). On the other hand, this 'infrastructural death' is the spectre of 'dead labour' that is amassed in infrastructural networks and systems (Mitchell, 2002). Reading Simone's 'people as infrastructure' through Marx's (1973, 461-2) work, Addie (2021) demonstrates how 'dead labour' denotes the products of labour that went into the production of urban infrastructures, and which becomes reanimated when 'living labour' producing material commodities and abstract value, acts upon it. This relationship between embodied practices of labouring and how they are expressed within, as well as built into, infrastructural systems, highlights how practices of the body – specifically, its capacity to labour – are reified in networks and systems of infrastructure. In this sense, bodies in and of themselves are not ontologically infrastructure (e.g. Andueza et al., 2021; Fredericks, 2021) but become violently *infrastructured* for the ends of capital: through the exploitative appropriation of their labour, they are given over to the biopolitics of capital that, as we highlighted here, take specifically gendered, classed, and racialised forms.

Whilst these modes of infrastructuring can result in the direct annihilation of the most marginalised for the political and economic ends of capital (see Tyner, 2019) – particularly so in the postcolony where the power of the state and capital takes the most grotesque necropolitical forms (e.g. Mbembe, 2019) – the violence of infrastructure is not necessarily final. The body, however, violently infrastructured, harbours the possibility of an otherwise, and with that the possibility of an infrastructural otherwise as well, which we discuss in the following section.

3 Constitutive tension: Violence and fugitivity

Even though specifically racialised, gendered, and classed bodies become *infrastructured* as they are given over to the violence of infrastructure under racial, colonial, patriarchal logics of capitalism, corporeal life is never fully controllable. Bodies can, and will, flee power. As Hendriks (2022), for instance, demonstrates, local poor wage workers in Congolese timber logging camps, although subjected to racialised regimes of exploitation that constitute their bodies as discardable within global value chains of timber production, escape this power, even if fleetingly. Deep in the forest, they evade company surveillance: unsupervised but during work time, they take naps, consume alcohol, or have sex, blaming heavy rain, sludgy mud, and thick forest greenery for their unproductivity. Therefore, the power of multinational timber firms to relentlessly exploit racialised groups is not omnipresent but fragile: workers' unruly bodies, with logics of their own entangled with affective currents of desires, mobilities, and expectations, derail officially planned objectives of extractive timber production (Hendriks, 2022). In this sense, in spite of capital's violence, human life is not, and cannot be, completely folded into an accountable yet discardable infrastructure of surplus value production. As Lesutis, (2022a, 124) notes, 'precarity that defines a life, exhausted and wearing out through the violence of spatial capitalist abstractions, is never an utterly helpless position'. When faced with violence – or even the possibility of 'infrastructural death' (Addie, 2021) – the body is also a fleeting possibility of an otherwise. However, how this possibility might be expressed ought to be analysed in a specific time and place, for it is inescapably conditioned by spatial configurations of capital, infrastructure, and violence (Lesutis, 2022a).

Understanding embodiment as unruly multitudes of possibility has defined contemporary social theory at large. In the 1990s, for instance, Butler (1990; 1993) influentially argued that bodies, in spite of their subordination to power, flee oppressive subject positions. In this way, they undo normative codes of subjectivation. In this sense, the body can never be made entirely knowable to, or usable by, power. This is the ontology of the body: as Epstein (2021) notes, 'the body just *is*. This "thereness" does not itself yield political, let alone critical analysis. Yet in this ipseity also lies something that precedes political construction' (p. 265, emphasis in the original). In other words, there have always been bodies, before

there were states, capital, or infrastructure systems. This ontological banality highlights how bodies possess generative possibilities, with logics of their own indiscernible to power. In this sense, bodies can never be irreversibly made into malleable, one-sided infrastructures of surplus value production.

This indeterminacy of the body is vividly foregrounded in radical black thought. Here, the body is centred as a locus of phenomenological experience and a mode of being in the world (e.g. Fanon, 1986; Judy, 2020; Spillers, 1987; Weheliye, 2014). Going beyond the perils of naturalisation (specifically, that there is an ostensibly indivisible biological body anterior to racialisation), black thought conceives the black body as an indefinite process – as a fugitive outcome of the anti-black world. This anti-blackness is expressed through the enduring impossibility for the black subject to be recognised as such, belonging to, and in, the world. This is so because this world of recognition and subjecthood is premised on a racialised categorisation of being between a (white) masterful subject and a world as a fungible object, as well as hierarchies of (white) humans and (racialised) nonhumans (see Wynter, 2003). As Fanon (1986) put it, describing his sense of not feeling at home in this world, 'I came into the world imbued with the will to find a meaning in things, my spirit filled with the desire to attain to the source of the world, and then I found that I was an object in the midst of other objects' (p. 82).

Radical black tradition (e.g. Fanon, 1986; Judy, 2020; Spillers, 1987) foregrounds this epistemic of objectification-subjectification that underpins the modern ontology of subjectivity (Chandler, 2013), and with it the impossible recognition of black subjecthood, as well as the black subject's place in the world. In the anti-black world, to think of politics and geographies of black bodies requires foregrounding a refusal and suspension of this inherently violent epistemic; specifically, a refusal of the world that allows racialised categorisation of being to appear natural (Moten, 2017, 312). This mode of a politics is enacted by fugitive black life (e.g. da Silva, 2021; Harney and Moten, 2021; Moten, 2018; Weheliye, 2014). Fugitivity, for instance, constituted maroon geographies that were created by black people who, fleeing enslavement, attempted to live outside the bounds of whiteness as a violent inscription of racial hierarchisation. In this way, these people precariously built their lives in spaces where they chose to 'reject the logics of racial violence that structure the world around them' (Winston 2021, 2187). Here, the black body ought not to be defined in the inherently violent epistemic system that dehumanises this body. Rather, the black body is fugitive – it flees violence to which it is given over, finding ways to endure in the inherently anti-black world (e.g. Harney and Moten, 2013; 2021).

Alongside radical black tradition, feminist and queer scholarship demonstrated this standpoint of fugitive indeterminacy vividly, highlighting how bodies can never be fully subsumed to biopolitical logics of power and control (e.g. Berlant, 2016; Butler, 1990; 1993). Katz (2001), for instance, argued that social reproduction – and how embodied, corporeal, communal lives are (re)made contingently in spaces of not one's own making – constitutes lifeworlds where 'fleshy, messy and indeterminate stuff of everyday life' engenders fleeting possibilities of reconfiguration. Embodied life, therefore, is 'fleeting, non-linear, and porous' (Lesutis, 2023a, 397).

These indeterminate, fugitive bodies can, and do, create their own infrastructures – what Cowen (2017) calls 'fugitive infrastructures' as forms of social and material otherwise to capital's violent infrastructural forces. Indeed, such social infrastructures as marronage provided a radically different typology of infrastructuring that enabled formerly enslaved people to exercise control over their labour, diverting it from social and material infrastructures of surplus value production based on slave labour. As Mullings, (2021) notes, the control of one's labour was central to racialised and colonised people to 'retain a common humanity in the face of precarity, immobility and unfreedom' (p. 154). Marronage created its own governing institutions, divisions of labour, economic systems, and infrastructures. For instance, the Underground Railroad – a network of secret routes and safe houses established in the United States during the early to mid-19th century – was central in facilitating escape from slavery for people who refused enslavement (McKittrick, 2006). Therefore, social and physical infrastructures created

by and for fugitive bodies were central in counteracting the violence of racial, settler colonial capitalism and its slave labour-based infrastructures of surplus value production.

This subversion of violence is a constant possibility, especially so in contexts of ongoing settler colonialism. As critical indigenous scholarship highlights, infrastructure systems that are normatively different to those of capital need to be acknowledged, recovered, and sustained as a collective political opposition to 'cannibalistic' infrastructures of racial, settler colonial capitalism that 'feed upon their kin', driving indigenous people 'to oblivion' (LaDuke, 2016, 243). For Spice (2018), in spaces of settler colonialism where settlers aim to eliminate indigenous lifeworlds, the word itself – infrastructure – epitomises 'an apparatus of domination' (p. 48): it legitimises violence of settler colonial states masking it as 'critical infrastructure', simultaneously obliterating infrastructures of indigenous peoples. As a result, worlds of human and more-than-human relations, flows, and circulations central to sustaining indigenous ways of life are poisoned by 'critical infrastructures' of capital, such as hydroelectric mega-dams, oil and gas pipelines, coal mines, fracking wells, and uranium mines. In effect, infrastructures as 'settler colonial technologies of invasion' (Spice, 2018, 45) inflict violence on indigenous bodies that are continually dispossessed from the means of subsistence (Dhillon, 2015; A. Simpson, 2016; L. Simpson, 2017; Spice, 2018).

In these contexts of settler colonialism enabled by infrastructural violence, for indigenous communities 'assembling communal life' in itself functions as a type of infrastructure (e.g. Estes, 2019). Centering the well-being of one's community reorganises the labour of people towards sustenance of human and more-than-human life, instead of surplus value production for the ends of capital. These radically different expressions of infrastructuring also take specifically political forms in opposing and resisting 'critical infrastructures' that materially sustain settler colonial relations (Kindler, 2021). Collective practices of bodies – for instance, coming together to stop the construction of wellbores meant to crack-open deep-rock formations to extract natural gas, petroleum, and brine (Bostworth, 2022) – has been central to such politics of resistance. These practices that oppose the violence of infrastructure under enduring forms of settler colonialism highlight how infrastructure sites are key to contemporary political struggles (Cowen, 2017; 2020).

However, with our argument on how bodies become violently infrastructured, we also want to emphasise a different register of politicisation that bodies enact in contexts of infrastructural violence under racial, settler colonial, patriarchal regimes of capital. Bodies do not necessarily enact oppositional politics of fugitive infrastructures (e.g. Cowen, 2017; 2020; Kindler, 2021; Spice, 2018). As Weheliye (2014) notes in his analysis of the poiesis of blackness, the fugitive practices of the body do not translate into what Western thought would define as 'agential resistance'. In this sense, bodies are not what Doshi (2017, 127) calls 'sites where political agency is formed'. Instead, the praxis of the black body requires rethinking 'human-ness' outside of 'agency and dignity', specifically 'abandoning volitional agency as the sine qua non of oppositionality' (Weheliye, 2014, 121). In maroon geographies, for instance, enslaved people who fled plantations that had objectified their bodies rendering them fleshy infrastructures of plantations (da Silva, 2021) did not confront this racialised system but opted to live in its shadows. The fugitivity of the black body, therefore, did not lay grounds for agential resistance to openly contest violence in the realm of political agency. Instead, this black fugitivity evaded the searchlights, immersing the body in a world unknown and indiscernible to power (e.g. Harney and Moten, 2013; 2021). This constituted a specific politics of refusal – as the praxis of fugitivity highlights, possibilities of black life were occasioned but not contained by the violence of racialised plantation economies and their infrastructures of surplus value production (McKittrick, 2011).

We draw on such fugitive politics of refusal to highlight the enduring presence of violence under conditions of racial, settler colonial, patriarchal capitalism. Fugitivity foregrounds how the body as a lived, phenomenological reality of being in the world and of the world attempts to flee violence to which it is given over (e.g. Weheliye, 2014; Winston, 2021). In this sense, the body is neither infrastructure (e.g.

Andueza et al., 2021), nor the possibility of an infrastructural otherwise (e.g. Cowen, 2020), but a mode of fugitivity. This ontology of the body blurs the distinction between knowable and opaque (Lesutis, 2023a). The violence of infrastructuring works through this indeterminacy – the body being infrastructured but simultaneously fleeting in its exposure to infrastructure's violence.

Our focus on how infrastructured, and yet simultaneously fugitive, bodies endure harm, exploitation, and abandonment under the conditions of racial, settler colonial, patriarchal capitalism highlights the undeniable violence of infrastructuring to which specifically racialised, gendered, and classed bodies are exposed. Upon acknowledging this (unfortunate) undeniability of violence, 'infrastructural otherwise' highlighted in decolonial, queer, and feminist scholarship on infrastructure (e.g. Berlant, 2016; Cowen, 2020; Estes, 2019; Spice, 2018) becomes a kind of normative vision of infrastructure – a political imaginary of a different world. This imaginary could be made possible if, beyond the bounds of racial, settler colonial, patriarchal capitalism, we allowed and enabled each other to enact and express sociality in life-affirming ways. However, in today's world where social and physical infrastructures are geared towards surplus value production (e.g. Lesutis, 2020; Truscello, 2020), the violence of these systems continues to infrastructure specifically racialised, gendered, and classed bodies for the ends of racial, colonial, patriarchal capitalism.

II Conclusion

In the article, tracing the trajectory of critical geographical scholarship on the body's intertwinement with infrastructure, we argued that, although the body is not ontologically infrastructure, it can nevertheless enable infrastructure's functioning in explicit and/or disguised ways—whether in reproducing systems that sustain urban life, sociality, and capital or in suturing widening gaps of sub-optimal infrastructure networks. Analysing these dynamics, we theorised the body as *infrastructured*—the body as given over to the violence of capital and its infrastructure systems that subject specifically gendered, racialised, and classed bodies to surplus value extraction and/or abandonment; but also the body as simultaneously fleeing its irreversible exposure to this violence. On the one hand, this historically and socially specific argument foregrounds how bodies, dispossessed through racial, settler colonial, and patriarchal logics of capitalist development, become violently infrastructured for the ends of capital. On the other hand, our understanding of bodies as *infrastructured* (rather than being in and of themselves infrastructure) highlights the inherent fugitivity of life, through which we emphasise that bodies are ontologically surplus to power and its intersectional economies of violence.

Whilst infrastructuring works through this constitutive tension – the body being infrastructured but simultaneously fleeting in its exposure to infrastructure's violence – it ought not to be perceived as a process imbued with the incremental potentiality of reconfiguration. With our argument on bodies as *infrastructured*, we intentionally highlighted the unavoidable violence to which specifically racialised, classed, and gendered bodies are given over. In other words, even though bodies might fleetingly escape their subjection to violence, there is no escaping the fact that the violent forces of racial, settler colonial, patriarchal capitalism continually work *to infrastructure* bodies rendered dispossessed and disposable. In this sense, our argument deliberately shifts conceptual focus toward the violence of infrastructure in how critical geography perceives political possibilities opened and/or foreclosed by infrastructure as both ontology and epistemology of the world. As Bosworth (2023) notes, such explicit juxtapositions between infrastructure as violence and infrastructure as possibility are necessary 'to further elaborate how their ratio might be understood and thus composed differently' (p. 55).

With our emphasis on infrastructured bodies, we specifically highlighted the violence of infrastructure systems that should remain a key conceptual and practical question for critical scholarship. This is particularly important amidst the so-called 'Fourth Industrial Revolution', which is conditioning the merging of cyber and physical infrastructures on a planetary scale. What types of futures do these infrastructure systems open and foreclose, and for whom? As emerging research shows, proliferating novel technologies like cryptocurrency require not only expansive energy and material infrastructures but also the labour

of human bodies that sustain these technologies under extremely precarious conditions (e.g. Calvão and Archer, 2021; Rosales, 2021). Exploitation also pertains to initiatives such as ‘green infrastructure’ perceived as urgently needed for rapid technological transition amid the climate crisis (e.g. Bouzarovski, 2022; Stein, 2022). As Stokes and De Coss-Corzo (2023) argue, in these circumstances of transforming infrastructural relations, it is crucial to highlight ‘the importance and specificity of human labor’ (p. 433), particularly when collectively thinking about ‘how infrastructures could become more just and sustainable’ (p. 438). With this article, we echo such calls: our reading of infrastructured bodies highlights how the body functions as a practically engaged analytical framework to understand the inherent harm of infrastructure systems under racial, settler colonial, patriarchal capitalism, as well as the fleeting possibilities of an otherwise, however precarious, implied within them.

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Notes

1. In the article, we specifically focus on socio-material infrastructures that rank, connect, and segment people, objects, and landscapes, functioning as techno-politics of order-making undertaken by the modern state and capital (e.g. Barry, 2001; Hecht, 2011; Mitchell, 2002). This approach foregrounds the operation of power not only in social and economic relations but also in the material orderings of space that infrastructure systems co-constitute. Whilst these infrastructures are particularly visible in cities and urban agglomerations as spectacular nodes in transnational networks of critical infrastructures – and in the article, we primarily draw on such examples – our argument extends to all socio-material infrastructures that are urbanised in their structural function in planetary processes of surplus value production (e.g. Arboleda, 2020). This approach to infrastructure is important and necessary in the current period of increasing geopolitical competition over infrastructure development (e.g. Kanai and Schindler, 2019; Schindler and Kanai, 2021; Wiig and Silver, 2019), as well as when considering various social movements that aim to subvert inherently colonial logics of infrastructure systems under racial, settler colonial capitalism (e.g. Cowen, 2017; Estes, 2019; Kinder, 2021); as Cowen (2018), for instance, notes, infrastructures are ‘sites of some of the most important recastings of political life’ (np).
2. Whilst some authors capitalise Black as a political identity (e.g. Noxolo, 2022), in the article, we write black in lower cases to stay consistent with the most common spelling of feminist and queer epistemologies.

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