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## **POST-SOCIALIST INFRASTRUCTURING**

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## **INTRODUCTION**

Contemporary cities are entanglements of infrastructures from different periods, installed for diverse purposes in often discordant political and economic systems. In the geographical region usually described in terms of post-socialism or post-communism, regionally demarcated as Central and Eastern Europe (CEE) and the former Soviet Union (FSU), the multiple intersecting socio-technical systems include those belonging to imperial regimes (such as railways or tram systems from the Russian or the Austro-Hungarian Empire), or dating from the decades of independence in the early 20<sup>th</sup> century. Nevertheless, most importantly in terms of scale and obduracy, infrastructures date from the socialist era.

A consideration of these infrastructures and their linkage to contemporary cities in CEE and the FSU offers insights for two major geographical challenges. Firstly, following calls from comparative urbanism and the postcolonial turn in urban studies and geography more broadly (Robinson, 2006, 2016; Roy, 2016), the article expands the territorial scope on the burgeoning geographical attention on the role of infrastructures. Particularly, CEE and the FSU are still sidelined from these debates (Gentile, 2018; Müller, 2019; Tuvikene, 2016). Calls for critical area studies attending to the region and its relationality have been made more than a decade ago also in the pages of this journal (Stenning, 2005). A simple territorial expansion of research, however, is not enough to achieve more global urban and geography studies. Secondly, therefore, the article takes the critical edge of the aforementioned calls by offering new ways of attending to infrastructures through their relations to the past. The article attends to the processes of infrastructure planning, making and use or what is known as infrastructuring (Blok et al, 2016; Star & Bowker, 2006). By expanding, learning and challenging from a more-than-North/South perspective, the article argues that there is a lot that can be gained by looking into the ways in which socialist infrastructure ideals and practices as well as material continuities matter in relation to the post-socialist practices of infrastructuring. These insights are relevant for both the studies of infrastructures interested in the shifts from modernist ideal to splintered urbanism (Graham and Marvin, 2001) as well as to the studies of post-socialist transformations. While there is already much literature on the latter (see review in Ferenčuhová, 2016), rarely has research taken the perspective of critical infrastructuring to the cities of CEE/FSU (but see Collier, 2011).

The importance for infrastructural research rests on noting the interplay of infrastructures from different times, formed not *de novo* but in a process of accretion (Anand, 2015), often leading to all sorts of discrepancies. The past thus remains a contentious territory.

Nevertheless, this article maintains that the past is often a 'usable past' (Griffin, 2019), providing potentials for learning and action. The past is not merely something that was there, nor something that persists to present through path dependence. Instead, the past constitutes a sphere of possibilities, which are not locked to their position but can be revived or revitalized. Socialism, however, is often negatively connoted as something to dispend with (Martinez, 2018). This is where (post-)socialism becomes revealing. Not only was the Soviet Union one sixth of the world's territory and deserves to be studied on its own. Socialist and post-socialist spaces also offer powerful illustrative narratives. Socialism saw the implementation of spectacular, modernist infrastructural endeavours, for example in electrification, large-scale transport infrastructures or centralized heat provisions. Considering the fairly wide-scale provision of socialist infrastructures, such past elements are not merely material or discursive legacies. They also constitute potentially progressive ideas for infrastructural policies, even if the historical epoch they emanate from remains controversial, taking into account the numerous ways social and political liberties were curtailed. Post-socialist infrastructuring, the central perspective in this article, denotes then a system that is post-collective (Pickles, 2010) as well as individualizing and 'flexible' (Bouzarovski, 2015); a system leading to many unjust arrangements, but where, at the same time, historic projections, material realities and socially negotiated imaginations of 'socialism' contain alternatives for thinking and doing.

The article looks at heating, green spaces and public transport as cases which form the core

of infrastructural systems in cities, drawing from the experience of authors' extensive individual conceptual and empirical research projects on different sites of post-socialism. All three infrastructural systems have gone through a reorganization from universalized state provision to more individualized ways of use; i.e. away from more equitable and inclusive systems to individualization and exclusiveness, withdrawal of redistributive state funding, and a preference to upgrading through selective modernization of flagship infrastructures. Contemporary developments and policies are often set in neo-liberal and boosterist aims, rather than seen as means for increasing social justice. Following the critiques of existing post-socialist infrastructuring, the article attends to the potential to take elements—both governing methods and planning principles—of the past and develop them into forward-looking measures.

## **1) THE INTERSECTION OF AN INFRASTRUCTURAL LENS AND POST-SOCIALISM**

The growing geographical work on infrastructures—the so-called 'infrastructural turn' (Graham, 2010)—has made often hidden technical systems much more visible for an analysis of cities in both global North and South (Amin & Thrift, 2017; Graham & Marvin, 2001; McFarlane & Rutherford, 2008). The literature provides an infrastructural lens for attending to cities as social and material assemblages, as sites of inequality, injustice and violence (Rodgers & O'Neill, 2012), and as sources of intense politics (Nolte, 2016). An infrastructural lens highlights at least three aspects of infrastructures: (1) the persistence and stability of material urban networks, (2) their connecting and at the same time divisive nature, and (3) societal and political imaginations shaping the function and form of infrastructures. All three dimensions intersect with post-socialism, approached here as not simply an encompassing territorial marker—which is indeed limited considering the

diversity of patterns and pathways in formerly socialist countries—but as a conceptualization (inspired from Tuvikene in Hirt et al, 2016). This means encountering post-socialism in different aspects: the stability and obduracy of some infrastructures, changed divisiveness of infrastructures, or the transformations of political aims giving shape to particular infrastructural forms and functions.

Stability, resistance to change, in other words ‘obduracy’ (Hommels, 2005) is a central element of the interlinkage between infrastructures and post-socialism. Infrastructures provide material stability to cities: once built, they are resourceful, time-consuming and expensive to change (ibid.). In this way, infrastructures maintain societal orders and carry logics from one framework to another. For instance, socialist cities received extensive centralized heating infrastructures and public transport networks, which current regimes adjust to a different logic, preferring individualized approaches instead (Bouzarovski, 2015; Collier, 2011). While the argument about the continuity and obduracy of infrastructures is easy to grasp as the sheer persistence of metal and concrete, its full implications are more complex. The obduracy of some socialist-era infrastructures, for instance, rubs against important changes in governing, leading to uncertain ends and complications. The continuity is marked by ruination or retrofit of infrastructural systems losing their relevance—despite being physically preserved—or being actively re-made to cater for contemporary uses (Howe et al, 2016).

Furthermore, infrastructures connect by tying people and places together (Angelo & Hentschel, 2015), but they also divide; for example between those with access and those off the grid, or between those who receive frequent services, and those with limited access.

Thus, as they provide connected infrastructuralized territories for some groups, they create burdensome landscapes for others (Nolte, 2016), including differentiated infrastructure spaces (Högselius et al, 2016). While socialist infrastructures are generally perceived more equal in providing access than the post-socialist ones, there are examples to the counter: for instance, mobile communication systems have become widely used and accessible, and some rural areas may have profited from mass motorization.

Finally, infrastructures are not just technical systems with physical parameters, they are also ideological (Larkin, 2013). Political ideologies are manifest in infrastructures' scope, quality and governance related to normative considerations. In general, we observe a post-socialist shift to individualized, consumer-oriented citizenship, whereas socialist ideals of infrastructures meant free or heavily subsidized, low-priced and generally accessible heating, water, electricity or transport services (Tuvikene et al, 2019; also Wissen & Naumann, 2006). Even if there have been some revivals of modernist ideals of provision, the splintering and consumerist infrastructures emerged widely since 1990s, when access to heat, electricity, cold and hot water 'devolved from basic citizenship right to consumer good' (Chelcea & Pulay, 2015, p. 348), echoing similar trends around the world (Bakker, 2003).

Nowadays, we live among the 'ruins' of modernist infrastructural ideals (Wakefield, 2018). Nevertheless, modernist infrastructures often proclaim entrenched values of social justice and equal provision for wider masses. While these values are carried to the contemporary cities in the post-socialist realm through the obduracy of infrastructures, they are in many ways challenged by new infrastructural practices, such as pricing or access restrictions,

which nevertheless often also fail to work in homogeneously interlinked technical systems (Collier, 2011). Drawing from first-hand ethnographic and sociological research, examples below show that while the post-socialist organization of infrastructures manifest to certain extent progressive ideas of managing an excessive consumption of heat, provision of greenery to the public and delivery of public transport, they also often fail to do so and lead to variegated unjust and unsustainable relations. It is in this context where reviving some socialist principles of infrastructuring might be considered desirable by critical scholars, and practitioners and citizens alike. The following three vignettes are selected from different spectres of 'socialism' including ex-Yugoslavia, Russia and Central Asia; and they showcase different infrastructures, indicating the wide variety of post-socialist trajectories. Heating is illustrative for a shift of centralized modernist infrastructure to individualized but supposedly more environmentally oriented one; green infrastructuring highlights challenges of infrastructure-led developments in a global city; and transport reveals one of the remarkable changes from centralized public transit systems to privatized and individual automobility-led systems. While we offer here an analysis of three such systems of infrastructuring, we call for critical scrutinizing which elements of the past shall and might be mobilized in support of a better future.

## **2) PROBLEMS OF MEASURING INDIVIDUAL HEAT IN APARTMENT BUILDINGS**

Ethnographic insights into two post-industrial towns—the coastal town of Rijeka (Croatia) and the copper-processing town of Bor (Serbia)—revealed narrations of morality, and connections with the state, which was shaped by the experience of the past provision of district heating under Yugoslav regime, marked by a 'third way' socialism, yet sharing many similarities of central organizing under Soviet planning. Back then, residents could not



control the amount of heat. A central plant delivered heat into people's homes through a system of pipes; people could not disconnect from heating provision, nor could they even control the temperature, except by opening windows. The way of charging for heat consumption has usually been calculated per square metre with no relation to actual use. The central heating meant also the promise of comfortable and modern lives, a kind of reward for citizens who through their work were contributing to socialist modernity.

Over the last 25 years, however, there has been a big transformation in how people live with radiators in their homes, both in Serbia and in Croatia. The consumption is increasingly individually measured in some former Yugoslav states but in both Rijeka and in Bor the state is still the main provider of heat through its municipal subsidiaries. With the process of Croatian EU accession (in 2013), Rijeka increasingly received measures to deal with energy efficiency, including individualization of charging heat use with a hope to cut consumption and introduction of more energy-effective building elements. However, people in those countries are today voicing critiques with how the district heating works.

In Bor the individualized consumption is still not possible: one cannot receive a bill which would state how much heat one spends and thus the amount one should pay, due to the technical coupling of apartments to radiators and these to the centralized boiler. Much of the heating is still not individually measured or priced with many pipes going through apartments vertically, rather than looping through them as in the case of Rijeka. The technical layout, thus, does not allow measuring individual consumption based on apartments (see also Bouzarovski, 2015). Nevertheless, the ethnographic research in Bor revealed that people in these two different settings increasingly felt cheated by their states.

The interlocutors describe themselves as consumers who want fair charging for what they get (Jovanović, 2019). If they do not receive as much heat as they used to do before, they also do not want to pay more than they used to.

Nevertheless, Rijeka's case offers warnings on the individualized measuring of heating costs. In Rijeka, the residents had to install new measuring devices on their radiators. However, similarly to Bor, apartment buildings still receive in many respects a socialist delivery of heating—one, which is difficult to be individually controlled, and where individualized measuring would not provide correct results. Thus, once the measuring devices were installed, a lot of people got higher bills than before. The formula that the company invented took into account how much the whole building spent and then redistributed the load accordingly. As a result, some residents stopped heating altogether, and as the apartment grew colder, other flats had to pay more to keep their flats warm. Heat, even more than water, is an 'uncooperative commodity' (Bakker, 2003) as it travels through walls. In fact, it is difficult if not impossible to reach a fair universal formula as every flat in the building is different in terms of its relation to other flats and the behaviour of their inhabitants in terms of heating, as well as the position of the flat to differently heated and unheated spaces (such as outer walls or the roof). In Rijeka, there has been a lot of anger and resentment as well as protests against individualized measurements of heat. In 2011, there was an increase of heating costs for as much as 60% with 2014 adding another 35%, prompting a group of students and organizations to form protests gathering around 1,000 people with more dissents still expressed through social media.

The ethnographic interviews reveal certain continuities with socialist modernist ideals of

generalized and free or cheap provision of service to everyone in the stories of those residents. Their disappointment comes from their expectations from the state, and of the welfare and care that the state had in the past promised, but eventually failed to deliver (see also Polese et al, 2014). Thus, these examples show the changed activities of the state. Instead of providing as much as needed by citizens, the state pushes for individualized heating measuring, which fail to reach a solution wherein people would get what they pay for as proper consumers.

### **3) GREEN SPACES AS PART OF COMPETITIVE URBAN DEVELOPMENT**

Green spaces serve the populations by providing urban livelihoods—that is, they are part of green infrastructure. Green space development played a central role in Soviet urban planning, with the aim of providing healthy living conditions to all people (French, 1995). Whilst the development of green spaces presented a rather neglected topic in the early post-socialist period, a shift towards re-acknowledging the importance of green infrastructures can be observed recently (Dushkova et al., 2016). Moscow is a case in point. Since mayor Sergey Sobyenin took office in 2010 a shift in policies took place, in which green spaces, and public spaces more generally, became a central element towards transforming Moscow into ‘a city comfortable for life’ (Pravitelstvo Moskv, 2014). The new strategy was narrated as a shift from chaotic, grey and construction-driven city-making towards a green, eco-friendly and human-scale city for people. Comprehensive programmes on public space, recreational and green zones were launched, and many of the city’s latest flagship projects are green space developments, among them Zaryadye Park, Gorky Park or VDNKh, the two latter ones presenting redevelopments of Soviet-era green infrastructures.

Comprehensive green space development presents an important step to achieve more sustainable, healthy and liveable cities. However, research (see Zupan and Büdenbender, 2019 on the underlying ideological and political agendas as well as on the effects of current policies in Moscow) indicates, that recent green space developments rather became part of neoliberal city-making. First, in Soviet Moscow, urban parks served for health, recreation and leisure activities, while at the same time being intended as important political and educational platforms (Kulikov and Ostrogorsky, 2013). Current park developments in Moscow are in contrast primarily meant to foster international competitiveness and commercialization. On the one hand, these parks shall allow Moscow to compete with 'global cities' like London or New York. For the showcase project Zaryadye Park, for instance, international best practices like High Line in New York and Millennium Park in Chicago were presented as role models, international competitions were held and the architects of the fashionable High Line in New York were commissioned for the design process. In this sense, green spaces seem to have replaced or at least joined the strategy of competitive urbanism, with museums (Bilbao strategy) as their former key element. On the other hand, new parks became venues for intense commercialization and are even referred to as 'green Disneyland' (Aminov, 2010). Second, while parks and public spaces in socialist cities aimed at creating inclusive spaces for broad segments of the population, current park developments in Moscow are designed and commercialized in a way to attract certain segments, mainly the middle classes or hipsters.

The new green space strategy in Moscow has thus to be understood as a deepening of neoliberal urbanism, masked in liveable and sustainable city lifestyle and ecological narratives. Effectively, these parks are new icons of competitive urbanism, they further

commodify urban space and by attracting only certain groups of society they further socio-spatial polarization.

#### **4) SOCIALISM WAS THE EL DORADO OF PUBLIC TRANSIT**

The Soviet Union was probably the best thing that could ever happen to public transport in the region. It was a tremendous step forward for many cities, which, for the first time ever, received high quality systems of tramways or trolleybuses. Not without a wide range of shortcomings, the investments were significant and they were spent throughout the entire Soviet Union—even in very small and very remote cities, driven by the ideological background of bringing progress and sharing benefits across the whole large country. This was also due to a particular planning predisposition, with precisely defined traffic flows linking big factories with large housing estates, culminating in a massive influx of money into public transport, combined with very low car ownership rates. Yet after the end of the Soviet Union the situation is largely characterized by harsh disinvestment. Only some municipalities managed to maintain a high status of public transport (mostly capital cities), and to keep up investments. Other municipalities radically cut lines and service levels. Several dozens of systems collapsed entirely. In the South Caucasus, public transport was almost entirely eradicated, similarly in Central Asia (Sgibnev, 2014).

This collapse occurred as state authorities transferred the responsibility to run public transport to municipalities. The municipalities, however, were severely financially constrained. While some of them managed to find funds to keep public transport running, others just let them gradually die out. Indeed, municipalities felt the obligation of caring for the population, meaning, for instance, that municipally run public transport still provided

fare free public transport for some categories of citizens such as elderly or disabled—at the cost of lower service quality and scope. In this case, the socialist-era principle of public transport as part of a social security package lingers on, all while mass motorization and disinvestment heralded the end of Soviet-style public transport provision.

The most visible example of this systemic shift in mobility provision was the massive spread of private sector providers, such as *marshrutkas*. These, too, built on a Soviet-era experience: Soviet cities knew *marshrutka* services from the 1930s onwards (Sgibnev and Vozyanov, 2016), yet only liberalization, motorization and state retreat of the early 1990s provided the fertile ground for the rise of the *marshrutka* sector. In many ex-Soviet cities now *marshrutkas* form the backbone of public transportation, even in larger cities and agglomerations, such as Magadan in the Russian Far East, or Khujand in Northern Tajikistan, to draw from our own research (Sgibnev and Vozyanov, 2016). Thanks to these private-sector services, quite a high level of everyday mobility can still be maintained, even if public transport infrastructures have been downsized. While they might be polluting, insecure, not providing subsidized travel for elderly and vulnerable populations (Zyuzin & Ryzhkov, 2016), as well as being harshly criticized from sustainable and liveable city perspectives, *marshrutkas* provide employment opportunities for tens of thousands of people who have lost other kinds of livelihoods in the post-socialist realm.

However, for public transport closures, actors often matter more than factors do with key players making decisions. There are cities which have lost a third of their population, without barely any revenues but they may still opt for trolleybus lines (e.g. Murmansk, Leninsk-Kuznetsky or Nizhni Tagil). This is quite a potent sign of state building on wheels,

which may counterweigh some particular economic or planning considerations there may be. Moreover, electrically propelled vehicles last long and might run for almost 30 years, which is a longer life cycle than for regular diesel-engine buses. Thus, the existence and functioning of public transport is a question of local capacities and willingness for maintenance of lines and transport devices.

While not driven by sustainable development goals, the transport systems of socialist cities aimed to cater for wide masses. Post-1991, public transport has either been downsized with private minibus modes providing accessibility, even if with significant externalities in terms of liveability and pollution. Alternatively, flagship developments or enhancements of rolling stock are done without much improving the coverage and frequency of public transport (Sgibnev, 2014). Nevertheless, this is not claiming that public transport has not progressed—it certainly has become better for many riders at least in some cities (e.g. Moscow, Minsk or the Baltic capitals)—but there is no comparable focus on public transit as transport mode, nor such a strong focus on improving mobility provision in small towns as in the course of Soviet transport management. It is possible to argue, then, that state socialism was highly beneficial for public transport systems. Today, public transport, is again high on the agenda due to an increased interest in alternative, sustainable mobilities, and liveable cities strategies throughout the globe. However, until now, many cities in the former Soviet Union have largely failed in providing innovative solutions for mobility transitions, or even implementing basic policies for curbing mass motorization.

## **5 LOOKING BACK TO SOCIALISM OR DEVELOPING NEW ROUTES?**

All three cases discussed the historical entanglements of current infrastructure

developments, and highlighted past values and regulatory regimes. The cases suggest that there are valuable insights to learn from how things were done in the socialist period regarding infrastructures in general, and parks, public transport and heating in particular.

This article has shown that there is a necessity to have a closer look at novelties that at first glance appear as supporting sustainable, green and smart city solutions. Whilst such measures are often assessed against ecological and economic criteria, they often fall short in terms of socially inclusive, just city developments. For example, the programmes aiming to reduce pollution and improve energy-efficiency through the provision of EU funds for heating infrastructure in Rijeka, actually resulted in people paying more. In Moscow, the case of green infrastructures highlighted the tendency of using parks through neoliberal strategies for exclusionary and rent-seeking ends instead of providing recreational functions for wider masses as were done under Soviet infrastructure regimes. The examples thus show that past infrastructures might provide valuable insights for more socially just and equal systems, which contemporary developments, even with good ambitions, often fail to achieve. The socialist solutions to infrastructure provisions deliver a sense of equality and solidarity of the collective—values that are often stigmatized in contemporary post-socialist places. Re-evaluating such aspects of the past might be a way of countering the contemporary tendencies of favouring competitive and neoliberal narratives and practices and to eventually achieve a more just city development. Researchers and practitioners in urban studies and geography working on infrastructures should thus not be afraid to look back and take up positive elements and ideas from the past and transform them into contemporary and future-oriented solutions. The article calls for openness towards the past that is otherwise in disrepute.



Nevertheless, some caution in conclusions should also be maintained. For instance, while the Soviet Union might be seen as a public transport El Dorado, it did not provide the comforts of the public transport systems as, say, the trams and buses in many contemporary cities. Today, there is a need for novel strategies to deal with new as well as worsened challenges such as the rapidly increased car ownership. Similarly, drawing from the case of central heating in Yugoslavia, we should be reminded that this system indeed featured unsustainable and also polluting elements, particularly so if they have not been well maintained for already more than 30–40 years. The socialist practices might provide some inspiration but not wholesale measures.

The point we can take away from this discussion is that there is a need to incorporate questions of social justice and equity into contemporary infrastructural development, values which indeed were more central for infrastructure provision under socialism, on ideological grounds, yet also in planning practice. Thus, post-socialist infrastructuring suggests a critique of contemporary neo-liberal governing modes but also urges to take the past seriously for opening up new potential futures and alternative imaginations.

### **Data accessibility statement**

Most of the data interpreted in the article, that is not held in public sources, is held by respective researchers of article sections and is accessible through the authors themselves (regarding Section 2, from Deana Jovanović, j.deana@gmail.com, regarding Section 3 from Daniela Zupan, dzupan@hse.ru, and regarding Section 4 from Wladimir Sgibnev, w\_sgibnev@ifl-leipzig.de).

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