INTRODUCTION:
THE RISE OF 5G

How is 5G technology changing cities? In their dossier introduction, Sanna Lehtinen and Delfina Fantini van Ditmar survey the aesthetic, political, and ecological impacts of 5G networks and call for new critical models for envisioning urban futures.

As we move further into the hyperconnectivity paradigm of the twenty-first century, different cities' aesthetic identities are changing unforeseeably due to new technological and infrastructural advances. This dossier focuses on 5G infrastructure in particular, as it is fast becoming embedded in urban environments globally, changing both how cities look and feel and how they are being used. As the fifth generation of mobile internet connectivity, 5G offers a new platform for large-scale technological adoption by enabling faster and more steady connections. As CEO of Verizon Communications Hans Vestberg notes, "5G isn't just another tech innovation. It's the platform that makes other innovations possible." The most discussed of these include self-driving vehicles (SDVs), the Internet of Things (IoT), Unmanned Aircraft Systems, extended reality applications, and new types of urban surveillance.

In 2019, President Donald Trump affirmed that "the race for 5G is on, and America must win."[2] Several countries around the world are now competing to be the global leader of 5G — and to profit from the resulting economic benefits. 5G expert Daisy Curtis has noted that "being a world leader also means you are the example where more errors are likely to happen (you are tackling technical challenges)."[3] Telecommunications marketers and city councils are promoting the upgrade to a faster service through slogans such as "5G Solutions: the future is fast."

Being faster than 4G requires a greater density of small cell tower installations, which leads to modified landscapes. Because 5G requires the deployment of a massive amount of technological infrastructure, a vast amount of mining will be necessary. Cities colonised by numerous antennas have led to concerns about strongly altered environments. In philosophical and urban studies of urban aesthetics, this change would be recognised as a change in both macro and micro aesthetic layers, affecting not only the overall aesthetic identity of cities but also, and in some sense more urgently, the everyday experience of their citizens.[4] The deployment of technological infrastructure affects everyday places by adding yet another layer of human-originated artefacts to the perceptually dense landscapes of contemporary cities. In addition, technological infrastructure is colonising cities with no consultation, debate, or proper aesthetic consideration. Lawsuits and petitions have followed antenna densification in some cases, though the unplanned effects on entire cityscapes have not been fully revealed nor discussed so far. As such, 5G is becoming an increasingly central component of the technological mediation of urban aesthetic experience.

5G infrastructure is changing landscapes without clear discussion of the plans or their implications. The prevalent debates are severely polarised. On the one hand, big telecommunications companies and marketers promote profitability, possibilities, efficiency and entertainment. On the other hand, every now and then some news appears about conspiracy theorists burning 5G masts or ideas associated with a 5G totalitarian surveillance regime. We see a vacuum in the debate: the public urban discussion is nowhere to be seen. This dossier challenges the dominant rhetoric: What is left undebated and unheard? Where are affected voices represented in the public discourse? What are the socio-eco-political implications of the deployment of 5G? What are the effects of critical infrastructure being privately managed? What are the urban aesthetic and social impacts of these decisions?

This dossier explores the incorporation of 5G urban infrastructure and the ecologies around them at the intersection of urban aesthetics and techno-social challenges. Although aesthetics as an area of the urban lifeworld is often considered less important to a city's more critical functions, aesthetic values make other values visible. This dossier addresses the values translated into the 5G infrastructure and its urban expansion. To uncover socio-political issues and explore how the ongoing shift in technology affects the look and lived experiences of cities worldwide, we present perspectives from philosophy, urban aesthetics, design, architecture, and art.

Acknowledging the implications of 5G means rethinking the very ecology of the project in environmental and urban terms. Cities are not only home to humans, but also many species of animals and plants that have adapted to and struggle to survive in urban environments. 5G infrastructure has an effect on non-humans that is as of yet poorly understood. Which problems that could emerge for other species remain uninvestigated? Going beyond human-centeredness and addressing multi-perspective design, the dossier points towards the relevance of a diverse, pluralist, multi-species, and feminist approach when analysing the tendencies and the future of 5G as infrastructure.

By considering the political implications of enabling 5G and the critical ecological implications of 5G technology, the dossier aims to reflect on the externalities of 5G and to reconsider current urban and political design decisions. There is no reason why technologized, smart urban environments could not feel aesthetically authentic: this can be approached primarily as a design issue to be studied further.[5] Readers are encouraged to highlight the necessity to discuss, plan and monitor the extension of 5G growth and "network densification" while considering urban aesthetics, reflecting on socio-eco-political consequences, and imagining alternative 5G futures.

In their contribution, Carolina Ramirez-Figueroa and Luis Hernan argue that one of the biggest challenges in crafting new stories of 5G is not so much to find new narrative templates as it is to provide a voice for the underrepresented. The authors highlight the rich but often scattered nature of these counter-narratives. The same is true for the communities of non-humans. The authors depict how corporate interests are privileged over the concerns of local communities and highlight the power imbalance in the narrative spectrum of 5G: convincing narratives of promotion and financial benefit versus diffuse and unheard narratives of opposition told by a variety of storytellers with different formats and a diverse set of meanings and expectations. Although less organised and more diverse, local communities might oppose the development of new infrastructure on aesthetic or health grounds, thus providing a powerful counterpoint to the notion of 5G as the epitome of progress.

Using fiction to imagine preferable and unlikely futures, Ramirez-Figueroa and Hernan reimagine a radically different 6G, rather than envisioning promising faster speeds. But what of a decentralised, open-source infrastructure? Deeper consideration for the way that communities operate and use mobile networks might also bring about a different way of thinking about coverage and frequency use. And finally, 6G would need to consider the deep ecological impact that previous protocols have had in communities of non-humans, ranging from mammals to birds to insects.

Günter Gassner's contribution addresses the links between antifascism and anti-5G conspiracies. Looking deeper into this timely topic requires taking into consideration how 5G is currently framed in connection to diverse discursive formations. One of the clearest areas of interest from the antifascist perspective is the omission of social and environmental consequences of the rollout of 5G and how it is being promoted. Gassner emphasizes that the "aesthetic regime of 5G" bridges digital and physical spaces. New and emerging technologies and technical infrastructures become part of the rise of nationalism and racism through the far-right's adoption of various conspiracy theories since 2015. Gassner analyses how anti-5G conspiracies were in addition fueled by the Covid-19 pandemic. Because the anti-5G movement does not form a single and coherent theory it can be used to support openly racist ideologies: the conspiracies around 5G are in themselves powerful "infrastructures" for creating visions of some form of fascist ethnostate.

Fiona McDermott questions why we would keep granting some of these corporations exclusive access rights to public resources, from the massive industry of autonomous vehicles to the flourishing Metaverse, to mention a couple of examples. The author notes that the current rollout of 5G is led by business interests and therefore arguably takes the form of a false public utility. By understanding that the build-out of any infrastructure involves the embodiment of certain politics and values and mapping out the emerging issues of ownership and governance of 5G in cities, the article poses questions about the next generation of wireless infrastructure. Will it really be a democratizing force for the public good or will it centralize power and profits for private interests? The author emphasises the need for the regulation of spectrum markets as much as the physical environments of cities.

McDermott describes a hopeful vision of the current state of technology policy: EU policymakers calling for a pushback against contemporary techno-centrism so that technology development is built on caring for the natural world and accountability for social justice. The author indicates that if we don't address this, we will lament the mass embedding of 5G urban infrastructure and beyond in addition to the normalisation of technological promises and logics. Is it the infrastructure itself or more so what it enables that might be "regrettable": where is the distinction? McDermott envisions an alternative design of networks as true public utilities that use public resources for the benefit of citizens, not just the most convenient rollout.

The final essay of the dossier is a piece by Towards Atmospheric Care, which is composed of transdisciplinary artistic researchers Hanna Husberg and Agata Marzecova. It is based on the duo's ongoing interdisciplinary project, "New Electronic Ecosystem," which explores intelligent sensing landscapes in Finland, a country that has positioned itself at the forefront of a geopolitical struggle over the future of 5G and 6G technologies. Hoping to cultivate points of access which contribute to interdisciplinary and open-ended dialogues about the invisible yet omnipresent techno-ecologies that structure our lives and common futures, they investigated the broader histories, geographies and specificities of 5G. Husberg and Marzecova believe in a new ecological communication paradigm based on feminist and critically engaged considerations of atmospheric media technologies. As they note, a feminist approach is not anti-technological but relational and situated, highlighting that technology is historical and is always shaping our environments and social fabric. The article looks at the materiality and historical specificity of wireless networks and their environmental preconditions. In particular, considering noise, errors and leaks is a critical part of their efforts to broaden the discussion about what techno-ecological networks and digital ecologies we need for communal concerns in the ongoing ecological and social crisis.

Husberg and Marzecova interviewed a series of experts on telecommunication, atmospheric physics, and governance as well as critics whose insights inform their article. Their piece includes an excerpt from an interview with Prof. Marcos Katz (Centre for Wireless Communications, University of Oulu, Finland), a senior advisor for the 5G uptake. Professor Katz notes that the engineered opacity of 5G threatens the idea of technology as a universal tool, separating it from wider public and sociopolitical contexts. In Katz's words, ultimately this leads to exclusion and inequality, undermining the emancipatory potential that smart technologies aspire to have.

This dossier is part of ongoing research, and is intended as a departure point to get people to connect with the discussion about critical, alternative urban visions and a more democratic and multifaceted beginning for envisioning new relations. The discussion shouldn't be just about where infrastructure should be placed. Rather, we need to ask more fundamental questions. This requires seeking alternative critical models, a situated approach, new investigations, multidisciplinary and public discussions, a new set of policies, and a material ethics of care.

Authors:
Sanna Lehtinen (Aalto University) and Delfina Fantini van Ditmar (Royal College of Art)

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